



# Why rail projects need a regional plan

*A discussion paper*

**Jim Steer, Ian Wray and David Thrower**

***UK 2070 Commission***

*October 2024*

*David Thrower is an independent transport consultant and former transport adviser to the North West Business Leadership Team. He previously worked for Merseytravel and for Greater Manchester Passenger Transport Executive.*

*Ian Wray is honorary professor at Liverpool University's Heseltine Institute and a professorial fellow at Manchester University's Planning School. He is the author of 'Great British Plans' and was chief planner, Northwest Development Agency, 2000-2010.*

*Jim Steer is a director of Greengauge 21, and founder and former chief executive of the international transport consultancy Steer Group. He was planning and strategy director at the Strategic Rail Authority, 2002-2005.*

## CONTENTS

Foreword by Cecilia Wong, Chair UK 2070 Commission	2
<b>The North West: a national economic opportunity</b>	5
<b>National aims, delivered regionally</b>	8
Barriers to growth	8
Economic Goals	10
Objectives for Rail Investment	10
<b>Projects looking for a plan</b>	13
Improving north-south connectivity	13
Improving east-west connectivity	16
<b>Formulating a regional rail plan</b>	20
Railways: nothing if not a network	20
Funding a rail plan for the region	21
The regional rail plan	22
Central Manchester	25
The West Coast Main Line (and its branches)	26
<b>Conclusions</b>	29

## Foreword

The UK 2070 Commission, the independent inquiry into the deep-rooted geographical inequalities within the UK, has always seen transport as key to tackling our regional disparities. In our report *'Make No Little Plans'* we called for a strategy for connecting Britain over the next 25 years to make the UK one of the best-connected countries in the developed world.

This can be achieved through a UK-wide connectivity strategy to deliver a network of connected cities; sustainable mass transit systems within all major urban areas; and enhanced connectivity beyond to the marginalised communities, with the reopening or upgrade of up to 3000 km of rail line. This was detailed further in our Report *'Go Big Go Local'*.

The Commission called for action to eliminate the £20bn gap in productivity caused by poor local connectivity whilst decarbonising transport by:

- Re-allocating road space to secure the expansion of walking and cycling for short distance travel in local neighbourhoods.
- Creating a nationwide scheduled public transport network which is user-friendly, low carbon, reliable and accessible.
- Implementing a 1000 miles electrified rail investment programme, securing transit systems in all cities/major towns, and re-opening lines to selected areas 'left behind' by the 1960s' 'Beeching Cuts'.

The former Prime Minister, Rishi Sunak, announced that HS2 Phase 2 connecting Manchester and the North West of England with London and the South would be abandoned just north of Birmingham. This decision was made without proposing any alternatives to the need to reconnect the nation and seemed to sink plans in the area of for Northern Powerhouse Rail too.

In this independent discussion paper, David Thrower, Ian Wray and Jim Steer take up the challenge of identifying the investment needed to make the most of sunk capital and address known shortcomings in today's rail system, whilst delivering on the goals outlined in our earlier reports. Their focus is on North West England, a region where the absence of a regional plan will hinder, they argue, an efficient and successful rail investment programme. Of course, equivalent arguments also apply across the other English regions.

Their discussion document, rightly focuses on the need for economic growth, enhancing agglomeration economies and productivity, and supports a just transition to net zero carbon. A new economic geography for the UK is required with northern cities playing a bigger part. The decision on HS2 must not distract from the need for a connectivity revolution, in which rail investment must play a critical part.

This report sets out a framework of priorities for investment, whilst advocating a new mechanism for agreeing plans and sticking to them. It demands careful attention. I therefore welcome it as an important contribution to the debate that is required about future transport priorities in a period of constrained public resources.

**Professor Cecilia Wong**  
***Chair, UK2070 Commission,***  
**October 2024, Manchester**

## The North West: a national economic opportunity

1. In the North West, there's a strong level of confidence amongst business leaders, with lots of residential and hotel investment in the pipeline, and new industrial investments too.
2. In the very long cycles of decline and regeneration, Liverpool, for example, has reached a tipping point and is on the other side. It is easy to forget that it has kept the motor industry, chemicals, the port and the shipyard (with a full order book), all paying good wages, on top of the service sector.
3. Largely by virtue of history, redevelopment of its derelict docks has been integrated with, and helped to support, the city centre and its commercial retail and cultural offer, and done so to their mutual benefit.
4. New trains have transformed the appearance of the 'metro' – the Merseyrail Electrics network, a rail operation which itself is a triumph of regional devolution from over 20 years ago, and which, as we will suggest, forms one of several key building blocks in creating a better connected North West.
5. Manchester's turnaround, though less dramatic (Liverpool gave the impression of a defeated city in the 1970s) has been equally profound. Led by stable political leaders and a brilliant chief executive, in the late Sir Howard Bernstein, Manchester has tremendous confidence. City centre living, in huge new blocks, is creating an Asian-style high rise centre, a new high status housing market with city culture on the doorstep, which is attractive to the young and highly skilled. GCHQ's decision to move a significant part of its operation into central Manchester has been a litmus test. It seems GCHQ was unable to recruit the scientific and technical skills it needed in either London (too expensive for young families) or Cheltenham (too old-fashioned for the tech generation).
6. Despite well-rehearsed problems, the North West region's economic assets and opportunities are substantial. There are some very high growth locations, such as North Cheshire, South Manchester and Warrington<sup>1</sup>.

---

<sup>1</sup>Looking at total GVA change 1997-2013, Warrington was eighth fastest growth location in the UK with 104.6 per cent growth. Source: Liverpool City Region Foresight Prospectus, Heseltine Institute, October 2015

7. International air connections are to European standards, and the best outside London and the South East. There is a much more positive local attitude towards investment and expansion than in the south, reducing the risk of planning delays. There is a diversified economic base right across the region, from SMEs to big corporates, to wealth management, to tourism.
8. It is a key centre of the UK's manufacturing base and associated research and development across the defence, aerospace, nuclear power, wind power, pharmaceuticals and automotive sectors. The key facilities for advanced manufacturing often lie beyond the big cities. So when it comes to questions of connectivity and transport priorities, it is not all about the major cities.
9. Manufacturing productivity in the UK, unlike services, has been rising sharply<sup>2</sup>. The scale of consumer markets (and thus logistics potential) offers scope for a positive rate of return on transport and logistics-related infrastructure investment.
10. The North West is the area of economic opportunity geographically nearest to the Republic of Ireland with its overheated economy and housing market, with many traditional connections.
11. Only the London city region has bigger scale and diversity of resources than the southern part of the north – Liverpool, Manchester, the places in between and Cheshire. Here, the North West has overlapping economies. The cities have scale and presence as do the universities, associated research bases and skill pools.
12. The proximity of Liverpool and Manchester, only some thirty miles apart (and the Leeds and Sheffield labour markets within reach too) should mean that with effective transport connections agglomeration economies could be delivered. But this is not happening as much as it should. Reflecting poor transport connections, volumes of commuting between cities on opposite sides of the Pennines are low. Better more reliable trans- Pennine rail services will enable economies on both sides of the Pennines to prosper with reduced dependence on the under pressure M62. But road and rail connections to the south – the West Midlands, London, the South East and the channel tunnel remain over-stretched, leaving the region's economy vulnerable.
13. There is much more to the region's economy than Liverpool and Manchester. Large swathes of its manufacturing base including aerospace, defence, chemicals and nuclear power are beyond the big cities.
14. The North West provides access to housing at relatively low cost. In Wirral for example, a 1980s flat in an attractive development can be bought for around £50k - with 15-minute access to Liverpool, 45-minute access to Chester and 60-minute access to Manchester. These are significant attractions to younger skilled people without housing equity.

---

<sup>2</sup>The Economist, Food for thought: British manufacturing is doing well, 21 October 2023

15. The huge student populations in Liverpool and Manchester could be accommodated in lower rental locations, commuting to study, as happens extensively in the USA. All this means that there is scope for affordable growth in the region (i.e., not living in the parental home).
16. In addition, there are very high-quality living environments, notably in city centres (with growing potential), Cheshire, some parts of Lancashire, much of Cumbria and North Wales, as well as leading national level cultural and sports facilities and institutions.
17. Unlike London and its surrounds, the North West has the housing supply and housing potential to accommodate economic growth without the South's crisis of superheated house prices and shortages. Substantial agglomeration economies could be developed, especially as 'working from home' now makes it possible for knowledge workers to live in the North West whilst working for employers in the South<sup>3</sup>.
18. But the weakness of transport connections remains a barrier to growth. The region's inherited Victorian rail network has seen low investment, and operates with low speeds and poor service quality. Numerous old industrial towns with high deprivation levels are isolated from wider labour markets and from each other. There are very high volumes of freight and commuting on the North West's congested motorway system.
19. Government's recently published industrial strategy recognizes the potential importance of city regions as a basis for growth beyond London. It recognizes too the need to sharply improve productivity as well as increasing economic growth. But it is reticent on how the old industrial towns outside the big cities might best contribute to solving these problems by building agglomeration economies beyond the south and attracting investment. We believe that in the North West (and potentially in other regions) a much improved rail system has an important role to play within and between the city regions *and beyond*. A better regional rail system can: widen the labour markets of the city regions; tie together the more isolated labour markets of the old industrial towns (several of which have critical skills bases in advanced manufacturing and defence); and bring these places back into the heart of the region.

---

<sup>3</sup>Why Face to Face Still Matters: The Persistent Power of Cities in the Post Pandemic Era. Jonathan Reades and Martin Crookston, Bristol University Press, 2022

## National aims, delivered regionally

20. Economic growth; connecting communities; a healthier nation; staying on track for net zero – these are national policy aims.
21. Much of this ambition can and should be delivered through a re-invigorated local authority sector, championed by Combined Authority Mayors and others. But just as with challenges such as a strengthened national grid, railways form a *national* network that needs national-scale oversight<sup>4</sup>, now expected to be delivered by Great British Railways (GBR).
22. From a national perspective, the rail network is usually seen as interconnecting main lines, with regional tributaries, radiating from London. In operational terms this is all very well (indeed it is inevitable), but informal partnerships have had to be struck (stakeholder boards etc), to try to align rail service development with local and regional aspirations. These various informal relationships need to be fashioned into a more purposeful linkage, so that economic and social aims set regionally are infused into thinking on what is required of the rail network.
23. The key device needed is a *process by which rail development plans can be set at a regional level*, with GBR and Network Rail ensuring functionality, including more widely at a national network level.

### Barriers to Growth

24. What is holding the region back? One key problem is the weakness of transport connections. The curtailed HS2 project currently constrains rail capacity between the North West and the Midlands and the South East, with its dominant freight ports.
25. With the exception of motorway building in the 1960s and 1970s, there has been historic under-investment in the transport networks since the War. The ageing Victorian rail network has seen low or limited investment and even disinvestment, and generally offers low speeds and poor

---

<sup>4</sup>Signals Passed at Danger, Railway Power and Politics in Britain, Richard Faulkner and Christopher Austin, 2023, p163



service reliability levels<sup>5</sup> (with much network contraction since the 1950s)<sup>6</sup>. The region is over-dependent on its now congested motorways, despite recent widening to use hard shoulders as lanes – a decision which unfortunately may need to be reversed on safety grounds<sup>7</sup>. There are very high volumes of road freight as well as of car commuting on the motorway network across the region.

26. Many old industrial towns have high levels of deprivation, yet sometimes right alongside businesses drawing on high skills in advanced manufacturing (examples include Blackburn, Birkenhead, Barrow, Whitehaven<sup>8</sup>). The towns are often isolated and poorly connected to each other by rail (and sometimes by road too) and are often very poorly connected to the big cities. High-skill labour pools like Barrow exist in almost complete isolation from other places.
27. As Prime Minister Sir Keir Starmer has put it: “It’s common sense to invest and build...When people can’t get to work because public transport is poor, productivity suffers.”<sup>9</sup>

---

<sup>5</sup>Some regional-express average speeds between centres are reasonably competitive with car travel, for example Manchester-Preston 56mph, Newton-le-Willows to Manchester 53mph, both by TransPennine Express (TPE). But St Helens to Preston by TPE is only 41mph. Warrington to Stockport by East Midlands Railway is only 37mph. Bolton to Rochdale is only 30mph, and Bolton to Stalybridge just 29mph, both by Northern Trains. (*Source: Network Rail May 2024 timetable*) Between April 2023 and March 2024, 58.8 per cent of Northern Trains services were on time (defined as either early or up to one minute late), and 5.3 per cent cancelled. Some 47.7 per cent of TransPennine Express services were on time and 4.8 per cent cancelled.

Some 43.5 per cent of Avanti West Coast services were on time and 6.9 per cent cancelled (*Source: ORR Train Operating Company Key Statistics, published 30th July 2024*).

<sup>6</sup>Looking Both Ways: Liverpool City Region and its Wider Economic Hinterland, Report for the Heseltine Institute for Public Policy and Practice, and Department of Geography and Planning, University of Liverpool, Alan Chape and Ian Wray, 2017

<sup>7</sup><https://www.theguardian.com/world/commentisfree/2024/apr/15/the-guardian-view-on-smart-motorways-not-so-clever-without-a-hard-shoulder#:~:text=Smart%20motorways%20without%20a%20hard,where%20drivers%20have%20that%20option>

<sup>8</sup>For example: Barrow is the centre for UK nuclear submarine construction and thus for UK skills in mini nuclear reactors; Salmesbury near Blackburn is the base for UK research in robotics aviation in the Taranis Project <https://www.baesystems.com/en-uk/product/taranis1>

<sup>9</sup>Guardian interview, 12<sup>th</sup> October 2024

## **Economic Goals**

28. Here, we note five strands of the economy where transport sector capability weakens the region's economy, and we summarise the remedies needed:
- (i) **Connect the labour markets of the big cities, towns and the region as a whole.** This is wider but also more achievable than the Northern Powerhouse vision, which focused on high-speed trans-Pennine connections between cities. It is a North West region focus, achievable in a reasonable timescale, adapted to look more widely than just at the two major city centres. It would reflect the reality that much of the region's high-value employment (unlike London) lies beyond the city centres.
  - (ii) **Modernise and rebrand the inherited infrastructure,** re-using existing underused infrastructure as practiced in creating London's Overground system.
  - (iii) **Take a pragmatic and modular approach to investment** that will build up the system over the next two decades.
  - (iv) **Take a realistic approach to completing HSR connections** to London, using the new capacity created to provide more freight capacity on the rail network, reducing HGV traffic on the motorways and supporting 'working from home' workers and services exporters in the North West.
  - (v) **Get freight and commuters off the roads and on to electrified systems,** creating a transport system that runs better, has lower carbon emission (and is less congested than in the South East).

## **Objectives for Rail Investment**

29. The objectives for rail investment follow on naturally from these economic aims. They are to:
- Strengthen the economies of the major centres and city regions (Liverpool, Greater Manchester and Preston) as well as the smaller cities and centres.
  - Improve travel times, punctuality and reliability, making commuting by public transport easier and more convenient (commuting time directly impacts upon productivity).
  - Expand the passenger capacity of the region's network, and its links to London, the West and East Midlands, South and West Yorkshire, the North East and Scotland.
  - Offer sustainable transport travel options for tourism and sport.

- Create the extra capacity needed for growing rail freight, including deep-sea container, domestic intermodal, biomass and minerals, securing a switch from highways for long-haul bulk commodities, and reducing emissions, congestion and accidents.

30. Today's railway in the North West is disjointed, an inhibiting factor for those aiming to develop new and existing businesses, because employment catchments appear limited. Commuters are frustrated by unreliable, low frequency, services, with train cancellations meaning sometimes they are left stranded. Rail is not relied upon as it is in the South East. A problem on one line in London is annoying, but there is usually a way round it. Yet the volume of rail travel within a single region is highest in North West England, higher even than in South East England.<sup>10</sup>

**The dis-jointed railway: Ormskirk station on the Liverpool-Preston line. Passengers must leave their Mersey Electric train and walk past the track barrier to catch a diesel train to complete their journey**



31. This is why City Region Mayor Andy Burnham is right to concentrate on creating a joined up public transport network for Greater Manchester (the 'Bee' network). Rail will be part of this approach, necessarily complemented by bus and Metrolink, the city's light rail system.
32. For a city region, the answer can't be more car use: there simply isn't the network capacity to make that work.
33. As Centre for Cities research has shown<sup>11</sup>, compared with equivalent cities across Europe, places such as Manchester and Liverpool simply fail to accommodate the scale of workforce needed to support expanded centres within reasonable commute times. This is of course why

<sup>10</sup> <https://dataportal.orr.gov.uk/media/3g5pcn30/regional-rail-usage-apr-2022-mar-2023.pdf>

<sup>11</sup><https://www.centreforcities.org/press/gear-shift-press-release/>

the rail network serving cities such as Manchester is so important: rail, together with an expanded Metrolink can address this problem.

34. More widely across the North West region, most travel is by car. The national motorway network was, of course, born in the North West, the brainchild of the Lancashire County Surveyor. Now, nearly 70 years after the first section was built as the Preston bypass, it is a fully integrated network forming a 530-mile network of high quality roads across the region. But it is busy, indeed, routinely congested, and there is no overarching plan to increase its capacity safely. Growth in travel from a larger workforce, more students, more health centre/hospital visits, more social activity, more tourism and more sports activities – yes, all desirable in themselves – require that the North West’s rail network is shaped up to play an expanded role. This is needed for freight and logistics too.

## Projects looking for a plan

35. There is no over-arching plan for the North West, for its economic development or for its transport network. Two large scale projects – HS2 and ‘Northern Powerhouse Rail’ – have dominated discussion on rail development in the North West for the last ten years. If the recommendations of the recent report of the City Mayors of Greater Manchester and West Midlands<sup>12</sup> are adopted, a de-scoped version of HS2 will at least reach the North West after all, but only just, at Crewe – at least until any further extension is formulated and agreed. This leaves the North West, in effect, with a blank sheet of paper in rail development terms.
36. All rail projects need to be grounded in a clear plan, the key characteristics of which should be staged/incremental delivery, adaptive to changed priorities over time (as the National Infrastructure Commission has advised<sup>13</sup>), but from the outset given the task of overcoming identifiable limitations of the inherited rail network, as well as addressing wider policy objectives.

### Improving north-south connectivity

37. The choices for Government on HS2 are now about where to draw the line. HS2 was always designed to increase network capacity limitations, and these have not gone away in the 25 years since it was conceived. Of course, it makes sense that HS2 should, after all, reach Euston as planned, rather than be held hostage in the west London suburbs. That’s the easy bit. The choices at the northern end of the line are more complex.
38. It was realised ten years ago that joining HS2 into an existing rail bottleneck in Staffordshire, where Europe’s busiest mixed-traffic railway, the West Coast Main Line, runs parallel to the busiest interurban section of the M6 Motorway, makes no sense.<sup>14</sup> Here the West Coast Main Line narrows from four tracks to two, and has capacity-limiting junctions both north and south of the tunnel at Shugborough.

---

<sup>12</sup><https://www.newcivilengineer.com/latest/mayors-and-civil-engineers-call-for-conventional-rail-link-in-place-of-hs2-phase-2-16-09-2024/>

<sup>13</sup><https://nic.org.uk/studies-reports/rail-needs-assessment-for-the-midlands-and-the-north/>

<sup>14</sup> But unfortunately this is the location to which the truncated northern limit of HS2 of October 2023 is connected.

## The West Coast Main Line 2-track bottleneck in Staffordshire



39. So, in 2014 it was decided that delivery of the southernmost part of the second stage of HS2 would be accelerated, so that HS2 would bypass the bottleneck with a new section of line built across Staffordshire to reach the North West, at Crewe. This new section of railway would be opened at the same time as (or shortly after) the Midlands-London section of HS2.
40. This part of HS2 – a limited second stage (“Phase 2a”) – has a sound business case, Parliamentary Powers and much of the land needed for this connection across Staffordshire has already been obtained. Its aim is to create transport network *capacity*. It is in effect a project ready to go, held back now for over two years.
41. As noted, the Mayors of Greater Manchester and the West Midlands working together with *gratis* private sector support concluded that this is indeed the best way forward. They even find scope for capital cost savings if the top line speed is reduced from 360km/h to 300km/h. Upgrading the West Coast Main Line instead, they say, is in effect infeasible. Building a road on the rail reservation is also, they point out, infeasible. So a ‘*Staffordshire Connection*’ is essential after all. It is in effect a bypass of the constraints at Colwich, Shugborough and Stafford.
42. But what should happen north of Crewe is less clear, for two reasons.
43. The first is that the once-planned HS2 link northwards towards Wigan, Preston and beyond (the “Golborne Spur”, which added rail network capacity was cancelled by Government following the Oakervee Review in 2020. This meant that few trains using HS2 to/from London would be able to run north of Crewe, with network limitations constraining the ability to reach destinations other than Manchester.
44. Carelessly, no fresh examination was put in hand to look into opportunities to upgrade existing lines north of Crewe instead. This, despite new HS2 infrastructure terminating at Crewe having

been, for the last ten years, an anticipated interim stage in the phased implementation of what was then a much larger project. With the funding for an onward stage to Manchester (partly re-defined as Northern Powerhouse Rail) no longer 'on the table',<sup>15</sup> any plan for the North West has to show how HS2 services are to be accommodated north of Crewe without what was once "Phase 2b", linking Crewe with both Manchester and the West Coast Main Line at Wigan.

45. The second reason is that thoughts on overcoming the weakness in the case for extending HS2 *northwards from Crewe* became entwined with the second major rail project hovering over North West England: Northern Powerhouse Rail (NPR). One project (HS2) provides better north-south connectivity, while NPR addresses east-west connectivity.
46. Between Crewe and Manchester, the hope was that both aims could be achieved by a single new (partly tunnelled) line, a conjoined effort needed because on its own, the economic case for Crewe-Manchester HS2 is flaky, once the Golborne link had been removed. But combining what remains with NPR doesn't help much either, since the Accounting Officer responsible found NPR's benefits to be barely 40% of its likely costs<sup>16</sup>. In any case, integrating two large projects like this increases project interfaces, a potential threat to programme management and cost control.
47. North of Crewe, there are as yet no Parliamentary powers, making this dual-purpose project a remote proposition. Implementation, on current planning and implementation timescales, would be in the second half of the 2040s at the earliest. But it's not for the current Government anyway, as they have already made clear.
48. HS2 implemented with add-on rail capacity across Staffordshire where both the railway and motorway run full much of the day would deliver a real strengthening of the North West's transport connectivity to the south. The new infrastructure between London, Birmingham and Crewe, could and we suggest should have a completion date in the early 2030s. A way will have to be found so that the existing railway network north of Crewe can accommodate additional train paths, for London-Manchester/Liverpool/Glasgow and Birmingham-Manchester/Glasgow HS2 services.
49. This inevitably prompts the question of *upgrading existing lines* in the North West to make sure they have the capacity and capability to accommodate the additional train services HS2 will foster.

---

<sup>15</sup> <https://www.liverpoolecho.co.uk/news/liverpool-news/chancellor-wont-commit-liverpool-manchester-30073093>

<sup>16</sup> <https://www.gov.uk/government/publications/government-major-projects-portfolio-accounting-officer-assessments/northern-powerhouse-rail-accounting-officer-assessment-summary-may-2024>

50. One unintended but inescapable consequence of such an approach which involves capital investment on the existing railway – is that the business case for a later, combined, HS2/Northern Powerhouse Rail scheme from the south/west into Manchester would be weakened. Improvements to the existing network in the meantime will have made a wholly-new line less valuable.
51. Adaptable, incremental, plan delivery shapes the viability of successive stages of investment.

#### **Improving east-west connectivity**

52. This serves to illustrate a wider problem with Northern Powerhouse Rail (NPR), the second much discussed major long-term rail project serving North West England (and Yorkshire/Humber and North East England). It too was launched in Manchester ten years ago, by the then Chancellor of Exchequer with a promise that ‘the money will be found’. NPR entails building a new line between Leeds, Bradford, Manchester and Liverpool (and picking up Newcastle, York Hull and Sheffield) but, ten years on, no part of it has reached the formal planning stage.
53. Meanwhile, the existing main railway line that NPR would broadly parallel is the subject of an ongoing Network Rail investment programme, known as the Trans Pennine Route Upgrade (“TRU”), now costed at around £12bn<sup>17</sup>. This is intended to deliver a major boost to east-west connectivity (see panel) with a narrower geographic focus than NPR, but with a huge overlap over the core Newcastle-York-Leeds-Manchester-Liverpool corridor.<sup>18</sup>

#### **Trans Pennine Route Upgrade**

This scheme entails a programme of continuous route electrification York-Leeds-Huddersfield-Stalybridge-Manchester-Liverpool, the creation of new grade-separated junctions between Dewsbury and Huddersfield, and various line of route enhancements including a major rebuild of Huddersfield station, provision of DDA compliant access to local stations, and improvements at Stalybridge station (the latter now completed). It is expected to support the operation of more frequent and faster core service (Leeds-Manchester journey times reduced to 41 minutes, with 4 and possibly 6 such services each hour). It will also provide a gauge-cleared route for intermodal (container) freight trains, with an hourly path provided

<sup>17</sup> <https://www.placenorthwest.co.uk/govt-commits-3-9bn-for-transpennine-route-upgrade/>

<sup>18</sup><https://thetrupgrade.co.uk/>



As of October 2024, some of the York-Leeds section electrification works are complete; Liverpool-Manchester (the direct line via Newton-le-Willows) is electrified as is the Manchester-Stalybridge segment.

54. But there is a risk that TRU will leave the most critical problems east and west of the Pennines unaddressed. This is because it too has been developed in a planning policy vacuum, leaving the challenges of expanding rail network capabilities at the major cities of Leeds and Manchester out of scope. These city centre locations of course bring into play other route geographies, options for the city region's metro/Metrolink systems, and questions of urban regeneration too – so a key role here for City Mayors. But ultimately addressing this total lacuna in rail forward planning needs the guidance that GBR is now expected to bring – and as a matter of some urgency.
55. Its predecessor in the shape of the shadow SRA 25 years ago, after all, identified the need for major investment in three such nodal points on the national rail network, but none were in the north and the crucial needs at Manchester and Leeds were not then foreseen.
56. For each of these major rail projects – HS2, Northern Powerhouse Rail and the TransPennine Route Upgrade – delays and uncertainties can be traced to the failure to produce a plan, even in outline, back in 2014, which could at least have resolved any question of overlaps between NPR and TRU. Projects conceived, designed and delivered in isolation and in the absence of a wider framework are likely to fail to achieve their objectives.

### **Northern Powerhouse Rail**

Ten years ago, Sir David Higgins, then Chairman of HS2 Ltd, pointed out that while HS2 (then a much wider project serving the east side of the country not just the west) would improve north-south connectivity, it wouldn't address east-west connectivity needs. The Northern Powerhouse concept had just been launched by Lord Jim O'Neill, and it centred on the idea of creating a critical mass of inter-connected northern cities to act as an economic counter-weight to London. Northern Powerhouse Rail was conceptualised to support this vision.

An outline of an east west rail connectivity strategy had been prepared for the city authorities of Manchester, Liverpool, Leeds, Sheffield, Hull and Newcastle (the report remains unpublished) in 2014.

It indicated service frequencies of 4 trains/hour or more (so, every 15 minutes) between these major cities, with faster journey times calculated by assuming existing lines would be used, freed of the need to accommodate other services (which in practice restrict timetabling flexibility and optimisation of any one service group).

It left open how these service outcomes would be delivered: these were 'conditional outputs', which is to say, target outcomes dependent on having an acceptable business case for whatever investment would be needed.

In one respect (Sheffield-Leeds), the then comprehensive HS2 plan, with some new connections, would have supported the ambitions of faster, more frequent, Northern Powerhouse city-city rail connections.

57. The choice between the two approaches of new build or upgrades to existing lines is never easily made. New lines disrupt communities through which they pass; upgrades, on the other hand, usually cause more disruption to existing rail services. Both approaches inevitably interface in differing ways with other rail services – passenger and freight – for each of which competing development aspirations may exist.
58. Addressing these strategic choices may look like comparing 'chalk and cheese' but they must be made to get clarity on the mix of upgrade (TRU) and new build (NPR) that best meets stated policy aims, that is, represents best value for money. These choices can only be sensibly made if (i) existing network & service weaknesses to be overcome have been identified and (ii) if achieving wider policy aspirations and ambitions (such as the Northern Powerhouse vision) have been properly valued.

59. For some, apparently, the choice is simple - “Rebuilding existing infrastructure is key for the government rather than rushed policymaking for new projects” suggests columnist Philip Inman, for example.<sup>19</sup> But HM Treasury and key stakeholders will surely need the evidence.
60. Current rail services between Liverpool, Manchester and Leeds are unacceptably poor. Better pan-Northern rail connectivity is a widely supported aspiration that any plan for the North West needs to embrace. But the emphasis for capital investment in rail in the North West should be placed on where the main problem lies - in central Manchester<sup>20</sup>.
61. Investment in city centres (the ‘nodes’), rather than along network links between the nodes, is clearly what’s most needed. Without investment in central Manchester the weakness of the existing arrangements will remain – including poor reliability and an inability to provide important direct connections such as Sheffield-Manchester Airport.
62. The present west-east rail network has numerous junctions, points of conflict and relatively low speeds, making rail relatively unattractive for commuting. Most notably, the inter-city travel times for the rail network between the major centres has barely improved from the 1960s, and in some cases actually worsened. Manchester-Leeds and Manchester-Sheffield offer only moderate journey speeds more akin to a secondary rural route. These shortcomings limit regional economic access to jobs and thus agglomeration economies. The plan for the North West needs to ensure these limitations are overcome, affordably.

---

<sup>19</sup>Guardian 7<sup>th</sup> October 2024

<sup>20</sup>High Speed Rail in Northern England: Tactics and Policies for Implementing Mega Projects by Modular Incrementalism, Jim Steer, Ian Wray and David Thrower, 2020, Built Environment Vol 46, No 3

## Formulating a regional rail plan

63. This analysis suggests four primary priorities for rail investment:
- Resolving the problem of network congestion in central Manchester
  - Making the best use of the investment in HS2
  - Bringing the West Coast Main Line north of Crewe into the 21<sup>st</sup> century, in terms of capacity and quality
  - Bringing the old industrial towns back into the heart of the region.
64. Here we show how a pragmatic and achievable plan for the North West region could be created, designed to deliver against these four priorities.

### **Railways, nothing if not a network**

65. Infrastructure owner Network Rail has its own inherited process of examining its 'routes'. There is outreach to local stakeholders in their reviews of potential improvements. But there is hardly any funding on offer. This needs to change, and so too does the perspective – shifting to set out what rail can do to address, region by region, the expressed wider economic development aspirations of Government.
66. The railway is a perfect example of a system, of a network. A change in one place has ripple effects. A focus on the links between the north's cities is right in principle, but in practice, the key problem to address with the rail system is most likely to arise at the 'nodes' of the network, not across its links.
67. The rail network's nodes are in city centres, where lines come together, and services inter-connect. It is in city centres such as Manchester, Leeds, (and also Sheffield and Liverpool – and major rail junctions such as Crewe, Preston, and Carlisle) where the investment focus should be. If these intersection points have the necessary capacity and capability then it should be possible to operate inter-connecting services swiftly and reliably: to give the North West (and the wider North) the kind of *network* of services that London and the South East enjoys, suitably scaled and targeted on the needs and opportunities in the region's economy.
68. As we will show, the North West has inherited a rail network of great potential. It has, for example, *three* existing lines linking Liverpool and Manchester. They have identifiable limitations that can be – and we argue, should be – overcome.

69. Meanwhile Government has made clear that previously ‘promised’ funding allocations towards a brand new Liverpool- Manchester railway of £12bn can no longer be assumed.<sup>21</sup>
70. Overcoming the limitations on the existing three lines between Liverpool and Manchester will cost much less than a new line, and deliver benefits more speedily, lifting the North West economy by a focus on improving its existing rail network, rather than on building new lines. And improving existing lines, rather than a new high speed line linking the city centres, will integrate the labour markets in the old industrial towns between Liverpool and Manchester.
71. The North and the North West doesn’t need, as has sometimes been suggested, an equivalent to London’s Crossrail. What it does need is an investment focus on the places where rail lines come together unsatisfactorily in city centres, where network capacity is limited.
72. There are successful and enviable models for this to be found in London and the South East, and they centre on major station reconstructions and expansions: London Bridge, St Pancras/Kings Cross and Reading, for example, where in each case additional capacity for more terminating or through train platform capacity has been provided in a much better environment for interchanging passengers. These great renewal and expansion projects have triggered a huge bonus in regeneration of their surrounds, acting as a stimulus in areas such as across the Kings Cross Lands<sup>22</sup>, for instance. These types of gains can and should be replicated across the North West, suitably scaled, place by place.

#### **Funding a rail plan for the region**

73. A key issue will be funding. The ability to support and stimulate economic growth means that the current tight spending controls on the rail infrastructure, on Network Rail, will need to change.
74. Positive experience with rail project funding sourced by property owners who can gain tangible benefits from better transport connections in London has led to notions that similar amounts could be raised elsewhere. But the scale of contribution achievable would be an order of magnitude less given much higher London property prices. It would be too low to be able to support the scale of rail infrastructure investment needed in North West England, for sure.

---

<sup>21</sup> <https://www.liverpoolecho.co.uk/news/liverpool-news/chancellor-wont-commit-liverpool-manchester-30073093>

<sup>22</sup>Planning, Politics and City Making A case Study of King’s Cross *Peter Bishop and Lesley Williams* , RIBA Publishing, 2016

75. Any solution to this problem needs to fairly apply suitable funding allocations across the regions (and devolved nations), possibly following the approach developed by the National Infrastructure Commission in its advice on meeting the rail needs of the North and Midlands.<sup>23</sup>
76. But in a period of reduced funding capacity, a specific mechanism that would allow investment in Network Rail assets to provide a return to HM Treasury would be desirable. A long term private sector concession model has been used successfully for HS1 in the south of the country, and it has been suggested that a similar model could be applied for HS2 (re-specified as a London (Euston) – Crewe project).<sup>24</sup>
77. The HS1 concession was let after project completion, taking the form of a large multi-£bn payment to HM Treasury in return for a long term right to enjoy cash payments from track user charges. (It should also be added, this was after an earlier attempt at a PFI-style deal before the project was completed had to be bailed out by Government). The approach successfully used for HS1 could of course also be applied to HS2, a proposition that serves to emphasise the need to ensure that the project is completed properly, and specifically in a way that ensures it can generate a full set of train path fees to maximise concession revenue and so payback to HM Treasury. A shortened project constrained by a need to join the existing network shy of the Staffordshire bottleneck would attract a much lower concession value: a false economy in other words.
78. But there is no reason to constrain a concession approach only for new-build railways. It could also be applied to existing parts of the national rail network subject to Treasury funding for upgrade investment in pursuit of economic growth goals. So this could provide a realistic way for Treasury to get a multi-££m payback from its investment in upgrades as well as from new-build rail projects.
79. The rail plan for the North West is designed to deliver against the economic objectives and opportunities identified for the North West. It will require a funding solution such as that described here, given the constraints on public sector finances.

### **The regional rail plan**

80. We show the plan and its geographic scope on the following page and describe its key features.

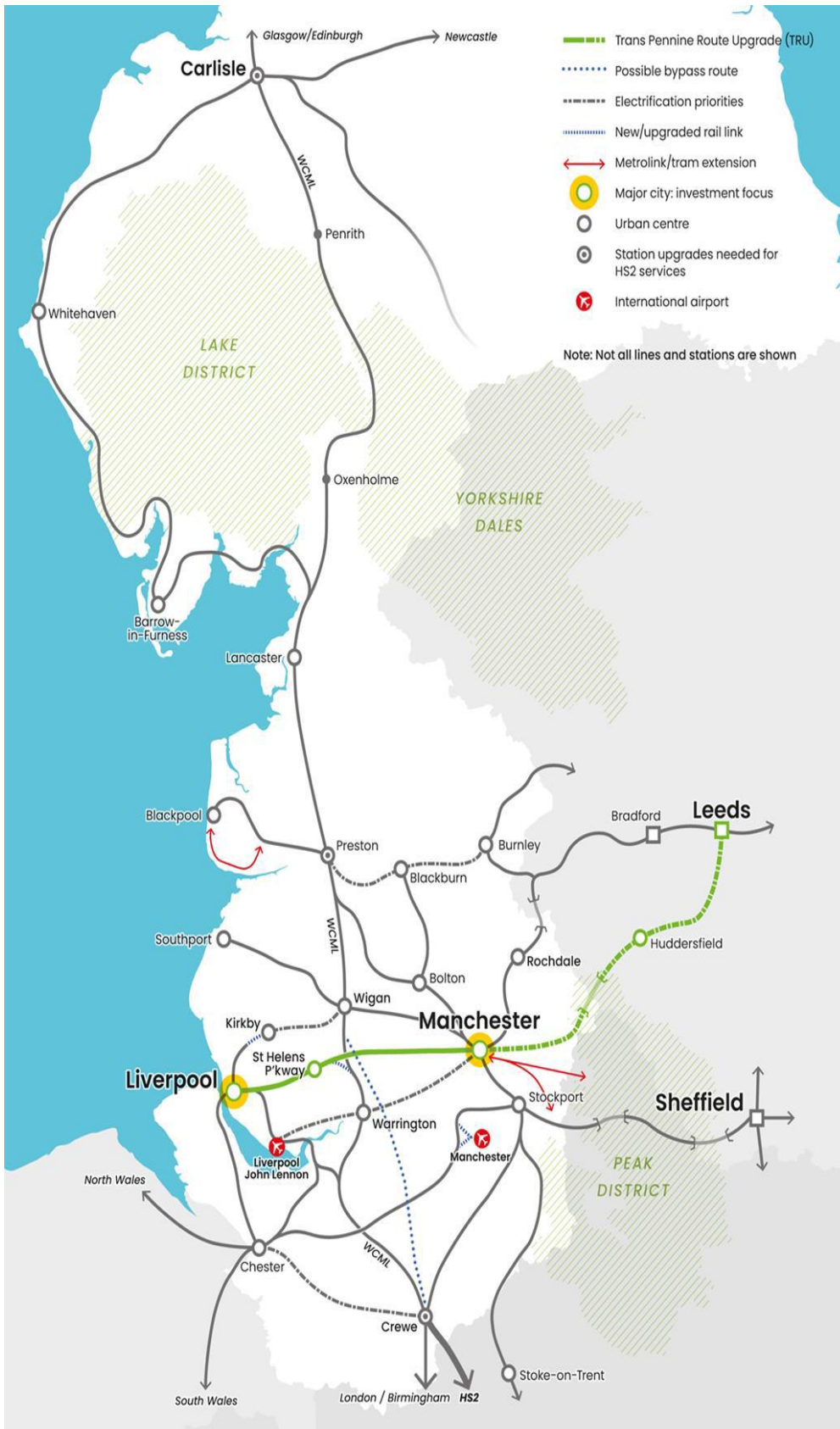
---

<sup>23</sup><https://nic.org.uk/studies-reports/rail-needs-assessment-for-the-midlands-and-the-north/#:~:text=The%20final%20report%20of%20the,of%20a%20wider%20economic%20strategy.>

<sup>24</sup> <https://www.greengauge21.net/making-money-for-taxpayers-and-the-treasury-from-hs2/>

# A regional rail plan for the North West

(not all lines are shown)



**There are three railways from Liverpool to Manchester already**

81. Between Liverpool and Manchester, there are two current routes in operation, via Lea Green and Newton-le-Willows (Chat Moss route) and via Widnes, Warrington and Urmston (the 'CLC' route). The electrified Chat Moss route is a straight-line alignment between Manchester and Liverpool centres (any alternative brand-new alignment would be longer). The CLC route via Warrington is not electrified. There is also a third line, but it is operated as if it is two lines with an end-on connection: they meet at Kirkby between Liverpool and Wigan.
82. We set out options for all three existing Liverpool-Manchester rail routes, via Newton le Willows, via Warrington Central, and via Wigan, involving respectively: the creation of a parkway hub for St Helens at Lea Green; electrification; and re-connecting the two lines which require passengers to disembark mid-journey and walk from one end of the platform to the other and re-board another train.
83. The Chat Moss route could be upgraded if needed for a service level expansion by introducing (or re-introducing) four tracks between Edge Hill and Roby and also into the Ordsall area of Manchester. Grade-separation of services from Lime Street to Victoria and from Salford Crescent to Deansgate could be achieved in the Ordsall Lane Junction area, Salford, with some property relocations.
84. On the Warrington Central/Urmston route, operational conflicts at Hunts Cross could be eliminated simply by re-modelling the trackwork. Similar simplifications could be achieved at Glazebrook by relocating run-around loops. The whole route from Liverpool South Parkway through Warrington to Trafford Park West Junction should of course be electrified. This would reduce journey times and improve service punctuality, quality and reliability, reduce emissions and improve air quality and reduce operating costs. Busy commuter lines like this in the South East are all electrified. In this case, electrification will also offer a network resilience benefit, an (electrified) diversionary route between the region's two largest cities.
85. The Liverpool-Kirkby/Kirkby-Wigan services would be re-connected, creating new direct services from Liverpool to Manchester, thus restoring direct rail connections between Liverpool and Bolton, for example. A rail link into Liverpool John Lennon Airport, should not be ruled out as a long-term option: a route (from the Merseyrail Northern Line) should be identified and protected. A new Liverpool-Kirkby-Wigan-Bolton-Manchester service would be possibly operated by 750VDC/battery/25kVAC trains, an evolution of the existing Class 777 units.
86. This would be a hugely welcome restoration of rail connectivity for sadly overlooked former industrial towns. Any idea that the Merseyrail network that serves central Liverpool and its



suburbs so well and so efficiently should not be allowed to stray beyond Merseyside itself needs to be overcome.

#### **Underused assets: Wigan Wallgate on the third Liverpool-Manchester railway**



87. Of course, these plans for better east-west connectivity, along with a large proportion of the rest of the North West rail plan, could only work reliably if the challenge of Manchester city centre capacity is resolved.

#### **Central Manchester**

88. Here we believe that there is a case to be examined for *either* a new east-west tunnel under central Manchester (this is how other European cities have solved similar problems) *or* a flyover and extra through platforms at Manchester's Piccadilly station. Either way, the North West rail network's future depends on tackling the constraints in the Piccadilly area.
89. Currently services have been carefully 'pruned' to resolve the earlier overloading of the Castlefield corridor following the creation of the new Ordsall link. This had provided the missing 'Picc-Vic' link across Manchester. It was the first stage of the 'Northern Hub' a plan advanced by the Northern Way – an oversight group of the North West, Yorkshire-the Humber and North East of England regional development agencies. It had been identified by the 'whole of the North' as the single most important transport measure needed.

## The capacity constrained Castlefield Corridor



90. The priority hasn't changed since. The truth is that the constraints of Manchester's rail network as the No.1 transport priority to be addressed for the whole of the North was recognised 15 years ago.
91. But the Northern Hub was only ever partly implemented, and the second key stage which centred on major changes at Piccadilly (and Oxford Road) stations was quietly forgotten.

### **The West Coast Main Line (and its branches)**

92. Planned HS2 services to Liverpool, Manchester and Scotland should be accommodated by upgrading existing rail routes as needed north of Crewe, to Liverpool and Manchester and to Carlisle at the northern end of our region of study, and onwards to Scotland.
93. There are questions about the West Coast Main Line (WCML) north of Crewe to address, and these are crucial to the Scottish economy as well as the North West; and to the achievement of DfT's transport sector decarbonisation plan.

94. This part of the WCML is in line for signalling renewals, and this is often seen as an opportunity to bring some wider improvements. It was last modernised 50 years ago, when it was electrified. Electrification from Crewe to Chester needs (belatedly) to be added.
95. Without the HS2 Golborne spur (in effect a Warrington bypass), it is assumed that the three HS2 trains each hour that would operate to and from Scotland will need to be scaled back to just one/hour, seriously weakening the scope that HS2 offers to bring about a significant reduction in air passenger travel where a competitive surface option exists. The carbon emission savings lost will need to be made up elsewhere if committed Government targets are to be met. Better then to set out what is needed across the considerable north-south length of the WCML in the North West to save the day.
96. Our North West rail plan shows the Golborne Spur open to reconsideration – with options such as a tunnel crossing of the Mersey to be considered along with the original plan. Upgrading the existing line through Warrington is another option. This would no doubt face the problem of disrupting existing services, and it would be essential to look at the timing of such an approach vis à vis tackling the capacity constraints in central Manchester which *inter alia* would provide the best available diversionary route when needed with work underway on this part of the WCML.
97. This again serves to emphasise the value of large-scale planning – being able to address the complex choices and the step-sequence needed to implement preferred outcomes. The decision to abandon the HS2 Warrington rail by-pass (the ‘Golborne spur’) should be reconsidered. The question is simply about how best to provide the network capacity needed.
98. In any event, some key junctions on the WCML are shown on the Plan as being replaced. Winwick Junction to the north of Warrington, if grade-separated, could offer a viable route into Liverpool from London Euston/the south, allowing St Helens Parkway much wider rail connectivity. It might also offer access to a re-sited Trafford Park freight terminal.
99. More generally, the West Coast Main Line will face a capacity challenge as inter-modal railfreight as well as passenger demand continues to grow. The speed differentials between the two classes of train (freight and passenger) are a key factor. An incentivised obligation on freight operators to use electric locomotives would be appropriate as would a programme to accelerate freight trains to run at higher speeds, closer to passenger train speeds and so increasing line capacity. Low speed alignments on the approaches to Carlisle and Preston stations would need to be addressed.

## Diesel rail freight haulage, West Coast Main Line, Crewe



100. Turning to the WCML branches, HS2 trains should be accommodated at a reconfigured Piccadilly Station and on an upgraded route from Crewe via Wilmslow and Stockport. Plans for a new alternative to Lime Street station would carry a high cost. Better to upgrade Lime Street to accommodate HS2 services.
101. Wales is poorly connected with Manchester, Manchester Airport and the North West as a whole. A new approach to Manchester Airport is shown in the plan, connecting the Chester-Northwich rail route via a short tunnel under the airport runways, a scheme long protected by the airport authorities. Development of this project would benefit from joint working of the North West region with the Welsh Assembly Government. There are options too for the re-connection of Sheffield's direct rail services to the Airport.
102. To better connect Pennine Lancashire, which includes areas of acute deprivation, we suggest partial electrification and related improvement to transport links to Greater Manchester.
103. In Cumbria we would like to see a study of the potential for increasing connections to Barrow and for reshaping the Cumbria coast line so that it effectively serves both tourism and local needs by integration with reconfigured bus services.

## Conclusions

### (i) A thought through plan yields deliverable improvement projects

104. Good project management demands a laser focus on outputs if costs are to be contained as they must be. No project gets funded unless and until it passes through a successive gateway review process, with evidence that benefits clearly outweigh costs.
105. This won't change with the overlay of a proper regional plan. These disciplines will be embedded. But the prospects of funding successful projects can be transformed with a regionally-set plan.
106. There are two reasons for this. The first is that in setting out plans, there is scope to select mutually re-enforcing, complementary, rather than competing, measures. As noted above, sequencing of development can be crucial. But more important still is that the planning process is an opportunity to bring together consideration of the various existing and potential services that can use improved/expanded rail infrastructure, with the prospect of delivering a wide set of beneficiaries. It is also a chance to ensure that development plans, for instance for major housing expansion, don't simply lead to more pressure on the highway network, with additional demand accommodated by rail instead.
107. The focus should be on those parts of the network where weaknesses in day to day rail operation are apparent. In the North West, the single most common answer when this question is posed will likely be, just as it was 15 years ago, 'the rail network into and across the centre of Manchester'.
108. So, when looking at the measures needed across the region to accommodate additional/longer trains into Manchester *via* Stockport when HS2 services commence in the early 2030s, for example, multiple challenges and opportunities can be, and need to be, on the table, such as:
  - The need for longer platforms at Manchester Piccadilly for HS2 trains
  - The ambition to convert the South East Manchester rail network into a cross-connected Metrolink system
  - The scope to re-site Freight terminals away from the over-stretched 'Castlefield corridor'
  - The ambition to provide Sheffield and Bradford with direct access to the north's main international airport without a need to change trains *en route*.
109. Fulfilling any one of these aims may well facilitate another. Looking at these challenges together may open up the opportunity for both investment cost savings and wider benefits. The joy of planning!

## Stockport station, a key interchange on the Crewe-Manchester route



110. It might be that the best outcome for the Manchester problem involves some major new construction, such as an east-west rail tunnel<sup>25</sup>. But equally, it may well be the case that de-conflicting the Piccadilly station approach, as was once expected as part of the (only-partially implemented) Northern Hub plan, would be a more beneficial (and more affordable) approach. It certainly could be aided by a re-location of the Trafford Park freight terminal (removing the need for multiple paths for rail freight each hour on the crucial Crewe-Manchester and Castlefield corridor routes).
111. Bringing all these opportunities together, made visible at a regional scale, looking at multiple beneficiaries, is how to build a plan.
112. Of course, central Manchester is just the biggest problem (and opportunity) in the North West. In the outline plan presented, we have attempted a full sweep across the whole territory. It is, of course, just a starting point.

---

<sup>25</sup> [https://www.greengauge21.net/wp-content/uploads/Beyond\\_HS2WEB.pdf](https://www.greengauge21.net/wp-content/uploads/Beyond_HS2WEB.pdf)

**(ii) Regional makes sense**

113. This report has examined a single region, the North West, because it exhibits a full set of challenges, especially given the cut-backs to investment in the nation's 'mega-projects'. We hope it serves not only as a call for action for the North West but also acts as a revelatory case of how to develop a coherent plan, properly prioritised, that other regions may wish to follow.
114. But is a 'whole of the North West region' the right scale: couldn't the future of the rail network be better examined at (say) city region level?
115. Our answer is no. Greater Manchester has 13 rail corridors each one stretching across its boundary into surrounding local authorities: it is at the heart of the North West's rail network, but cannot be the sole author of its development.
116. The North West region's interfaces by rail with surrounding nations and regions are limited in number making the need to interface with adjoining regional (devolved nation) authorities manageable: just one cross border link to Scotland, one to North East England, two to Wales.... These each need joint examination.
117. Our suggestion therefore is that formulating strategy for rail investment and indeed for other components of critical regional infrastructure should be an inclusive *regional* process. This might best be achieved by developing and rolling forward a Regional Infrastructure Strategy<sup>26</sup>.
118. This would be a non-statutory and advisory plan (and not therefore something which government could control or abolish). It would be an exercise in collaboration and co-production, agreed by an informal 'planning conference' with representatives from all parts of the region, as well as government representatives from the Department for Transport and HM Treasury<sup>27</sup>. Government would be expected to consider the advice from the Regional Infrastructure Strategy as it develops and implements national policy. Such a development would be compatible with, and might benefit from, the creation of regional ministers with responsibilities similar to those enjoyed by the Secretaries of State for Scotland, Wales and Northern Ireland, prior to devolution<sup>28</sup>.

---

<sup>26</sup>We note the recent publication of the all island of Ireland Strategic Rail Review which covers similar ground. <https://www.infrastructure-ni.gov.uk/articles/all-island-strategic-rail-review>

<sup>27</sup>There is a valuable parallel in New York's Regional Plan Association, which has steered the city region's development since the 1920s. See 'Adapting FDR's New Deal Vision to the United Kingdom', 2020 Ian Wray with Prof Bob Yaro, Penn University, USA, UK2070 Policy Paper; and Chapter 9 in Ian Wray, 'No Little Plans: How Government Built America's Wealth and Infrastructure', 2019

<sup>28</sup>Ian Wray. 'Reeves should use Liverpool's revival as a blueprint for growth', Financial Times Letter, 22July 2024

119. Our case study here addresses the key North West region, but there is a strong case for extending the approach and mechanisms we advocate to Yorkshire and Humberside which similarly has been disappointed to find HS2 commitments axed by the previous government, and NPR ambitions, with weak business cases, left unfunded. An equivalent exercise could be applied there, and indeed, across the other English regions.

**(iii) Precedents for regions working to deliver nationally set goals**

120. A Regional Infrastructure Strategy would not, of course, absorb statutory land use planning or planning for housing. But local authorities might be expected to demonstrate that they are taking the government's requirement for levels of house building into account if they are to secure regeneration and infrastructure funding to help implement the strategy. This contractual approach has been used successfully in French rail infrastructure investment in *Contrats de Developpement Territorial* (CDTs) in the Grand Paris project<sup>29</sup> and similarly in *Contrats d'Axe* (CDA) to coordinate regional rail transport stations and urban development<sup>30</sup>. In both examples the principle is the same. Both are rooted in a contractual relationship between national and regional rail planners and local government.

121. The French CDA is a bottom-up instrument which formalises commitments arising from negotiation with multiple stakeholders founded in consensus on public policy objectives such as public transport use, restricting urban sprawl and promoting economic development. The CDTs set targets for housing construction, economic development and public facilities in areas where future rail stations are proposed in the Parisian Grand Huit automatic metro network. They are contractual agreements between the state and the municipalities concerned. In practice they are not without difficulties but the principle of negotiation around a package of benefits and commitments seems very sound.

*The authors would like to make it clear that all views expressed within this paper are made in an entirely personal capacity.*

*All photos were taken by David Thrower, October, 2024*

---

<sup>29</sup>Caroline Gallez, *Contrats de developpement territorial* in the Grand Paris Project, *Town Planning Review* Vol 85, No 2, 2014

<sup>30</sup>Juliet Maulat and Aurelie Krauss, *Using contrats de d'axe* to coordinate regional rail transport, stations and urban development *Town Planning Review* Vol 85, No 2, 2014