

National Infrastructure Commission Rail Needs Assessment - Call for Evidence



Executive Summary

Transport for the North (TfN), the UK's first statutory sub-national transport body, published its Strategic Transport Plan in 2019. This sets out a 30 year strategy and outline investment programme to increase the North's economic prosperity through developing our transport provision. Developing and investing in the North's rail network is central to this and our approach is guided by the Long Term Rail Strategy that is part of the Strategic Transport Plan. This identifies sets out why change is needed, what that change should be and how that change should be delivered, based on five themes: Connectivity, Capacity, Customer, Community and Cost Effectiveness. This approach is supported by a series of conditional outputs and desirable minimum standards that define what rail needs to provide.

The North of England has a complex rail network that provides access to, from and between major population centres and their hinterlands, international gateways, rural communities and logistics centres. Although extensive, the North's network is mainly a mixed-use, predominantly two-track railway, with all types of passenger and freight services often utilising the same track. It is this characteristic which acts as one of the key limiting factors to the planning and delivery of rail services in the North. Despite this, rail use in the North has grown significantly and rail is at the heart of both the levelling up agenda and responding to the climate emergency and the Paris agreement on decarbonisation.

Whilst we understand the focus on capacity and connectivity for this NIC inquiry, the North' rail network is already constrained by reliability and lacks resilience. There are a number of locations that lead to reliability issues which can spread across the North. These are in major city locations and on key national routes. Investment is needed in the current rail network to address these issues and to allow the North's existing network to achieve the agreed minimum standards.

Significant investment is proposed to improve connectivity and capacity in the North of England. The Transpennine Route Upgrade (TRU) will provide for faster and more frequent journeys in the North Transpennine axis between Liverpool and the North East via Manchester and Leeds. A programme of investment in new cut-offs, infrastructure measures and electrification is planned to be delivered in the medium term, with Leeds to Manchester journeys in close to 40 minutes compared to 49 minutes today.

In the longer term, Northern Powerhouse Rail (NPR) promises improvements in capacity and connectivity across the North with a network linking Liverpool, Manchester, Sheffield, Leeds, Bradford, Hull and Newcastle and also Manchester Airport. NPR will be a mixture of new and upgraded lines that also complements and interfaces with HS2. As well as offering connectivity to London, HS2 has significant benefits in better links to Scotland, the Midlands and the West and Wales via the Crewe hub, some of which can be realised with early completion of sections of HS2 rather than waiting for the full network. This could be further assisted by bringing forward HS2 Phase 2a in line with Phase 1.

Whilst the Oakervee Review accepted that both NPR and HS2 are required, they remain as two separate programmes and HS2 treated as the priority. NPR and HS2 should be treated as equally important, rather than NPR being designed around a fixed HS2 scheme. This is evident in places like Manchester Piccadilly, where the TfN Board has asked Government to consider a different solution alongside the current HS2 design within the Integrated Rail Plan.

Investment in rail has potential to lead to significant economic benefit. Our work shows that the TRU alone could unlock 5,500 houses per year; 18,300 jobs and add £1.1 billion GVA to the economy

measured over a 30 year period¹. Compared to today, the combined effect of HS2, NPR and TRU is truly transformational – increasing the effective commuting catchment of our Northern cities by millions, as well as increasing the size of the labour market and the employment opportunities available to residents. Rail also significantly improves access to leisure and tourism destinations in the North and to international gateways, including our regional ports and airports.

To achieve maximum gain, it is important to consider the phasing of TRU, NPR and HS2 together to identify and exploit synergies and opportunities for early delivery. This has been hampered to date by fragmented programme development and differing accountabilities, for example whilst TfN is a co-client for NPR, on HS2 and TRU it is stakeholder and therefore has less visibility and influence. The programmes need to be future-proof and sufficiently flexible to accommodate changes for future generations with minimum disruption. This is important to ensure that there is a strategic approach to rail investment to support economic growth, rather than being an end in itself.

We therefore believe that an integrated pipeline of rail improvements that integrates the existing network with major programmes is essential. This will allow economic benefits to build up over time. It will also allow contribution to wider TfN efforts to decarbonise transport and move more travel onto public transport supporting the response to the climate emergency. Rail is already a low generator of emissions per passenger or unit of freight moved, and this can be reduced further by increasing the North's electrified rail network including the TRU, HS2 and NPR programmes.

Rail investment also needs to be part of an integrated programme across modes of transport and places and policy areas to support sustainable and inclusive growth. That single, holistic plan can only be achieved by the full involvement of all of our authority partners and Local Enterprise Partnerships (LEPs) across the North. The regional growth strategies undertaken by some authorities, funded and supported by Government provide a framework for delivery of HS2 and NPR. This joined up approach is at the heart of TfN's call for a Northern Budget.

TfN welcomes the opportunity to set out our views on the North's future rail investment needs. We see this evidence submission as the first step in continued dialogue with the National Infrastructure Commission and Government and look forward to positive engagement in the Integrated Rail Plan process to secure the integrated pipeline that we consider essential for the North.

¹ TRU Strategic Economic Narrative, Technical Note June 2018

Understanding the importance of rail in the North of England

1. The North of England's rail network is a vital economic asset linking major population centres and their hinterlands, international gateways, rural communities and logistics, connecting people to jobs, leisure and education. Despite the reliance on a network planned in Victorian times, rail use has grown significantly and continues to do so.
2. The North of England's rail network is comprised of a complex network of routes providing access to and from major population centres and their hinterlands, international gateways, rural communities and logistics centres. There are almost 600 stations in the North, a diverse range of major city centre hubs, suburban commuter interchanges and rural 'halts', each one a gateway to their communities.
3. It is a mixed-use, predominantly two-track railway, with all types of passenger and freight services often utilising the same track. It is this characteristic which acts as one of the key limiting factors to the planning and delivery of rail services in the North. It impacts on capacity, which in turn impacts on frequency of service. The mixed-use network and lack of flexibility creates reliability and resilience issues.
4. The challenges faced by the North's rail passengers are well documented. However in terms of passenger growth, the North of England's rail network is a success story. Over the last 20 years (1997 – 2016) passenger numbers in the North of England grew year on year at a faster rate than the national rate of growth including through the 2008 economic downturn.
5. But unlocking those benefits is challenged by the current state of the infrastructure. The network requires sustained enhancement if it is to attract and cater for the passenger and freight growth that will be associated with a rebalanced and better performing Northern economy. Integral to this is the need to capitalise on the potential opportunities presented by nationally significant infrastructure schemes.
6. The immediate crisis notwithstanding, it is essential that we plan and prepare on the basis that the market for rail will continue to grow significantly in the coming decades, with growth up to four times higher by 2050. That growth in travel by rail is not unprecedented and it is consistent with previous future scenario work undertaken by Network Rail and others. There is a clear opportunity to improve the market for rail in the North and deliver sustainable and inclusive economic growth by better connecting people, businesses and places to more opportunities for growth and prosperity.
7. Rail is at the heart of the levelling up agenda, critical in unlocking opportunity and economic choices by helping people and goods to be moved, to support social progress by accessing education and to drive decarbonisation, e.g. through electrification and elimination of fossil fuel use.
8. Rail will encourage trade and inward investment by improving links to the North's ports and airports, and faster links between the core cities. This will make the North a more attractive place for businesses to invest and to base themselves, and for airlines and the freight and logistics industry to serve those ports and airports. Better connections at a pan-Northern level, particularly connections between the North's existing and planned future economic assets, will create jobs and generate growth.

Creating an integrated rail plan – key principles

9. An integrated rail plan is long overdue. The North's network has suffered due to fragmented planning and delivery of enhancements, and it is essential that planned significant investments such

as the Transpennine Route Upgrade (TRU), HS2 and NPR are planned as integral components of the rail network.

10. We welcome the focus of this review on connectivity and capacity, but would add reliability (and resilience) as the other key driver in restoring the confidence of the travelling public, and helping to build new markets for rail in the coming decades. As work done by TfN partner authorities has emphasised, greater integration between rail, road, local public transport (including light rail) and active travel is also needed.

Connectivity – faster and more direct place-to-place travel - improved connectivity through faster and more frequent journeys is absolutely at the heart of our plans for the entire rail network for the North of England; TfN has set desirable minimum standards for that in its Long-Term Rail Strategy. In addition, speeding up services on the existing network could and should lead to absolute reductions in the operating cost of services. TfN is already undertaking work to establish the precise scope for that, the potential scale of such cost savings and the cost of the one-off investment that would be required to achieve such permanent savings in operating costs

Capacity – the potential for more trains to run where they are needed, particularly on crowded commuter routes. For 20 years (1997 – 2016) passenger numbers in the North of England grew year on year on year at a faster rate than the national rate of growth; we want to drive a programme of investment on the existing network across the whole of the North of England to provide the capacity to cater for the existing record high numbers of passengers and for such strong growth to continue year-on-year into the future. The North of England has some of the most congested locations on the entire British rail network (in particular Darlington – Newcastle, Doncaster, Leeds, Manchester, Sheffield, Stockport and York, and the WCML north of Crewe) and has a widespread and very urgent need for such extra capacity².

Reliability - this should also be a key outcome for Northern schemes. New line infrastructure and major upgrades provide an opportunity to transform reliability as well as offering faster and more frequent connections building confidence of existing passengers and attracting new users. This needs to be integrated into the existing network, offering additional resilience and safety for passengers and freight. TfN has pressed for development of new measures to achieve that on both NPR and TRU. TfN is ideally placed to identify a programme of infrastructure interventions across the whole of the network in the North of England that would make it fit for reliable operation³.

11. Preparing for future growth in a flexible way will be essential to delivering a network that can support the North's economy and people for the next century and beyond. Growth will change the distribution of people, business and industry across the North, leading to different patterns of travel demand in response. At the same time, technology is changing choices about work, housing and travel, not least in response to the current crisis.
12. TfN's plans are centred around the Northern Powerhouse Independent Economic Review (NPIER) and focused on transformational changes in economy and connectivity. By 2050 total annual demand for rail travel is expected to be up to 4 times higher than today. This would mean an increase in trips in the North from 180 million trips today to 760 million trips by 2050, with the strongest growth in rail demand is between the large urban centres in the North.⁴

² See TfN Long Term Rail Strategy. The Oakervee Review also recognised the point about WCML capacity north of Crewe.

³ Examples include the major through route stations at Leeds, Manchester, Newcastle and Sheffield, the East Coast Mainline north of York which is also part of NPR. medium-size schemes such as great separation at key junctions; and smaller schemes such as Colne and platform lengthening..'

⁴ Future transport demand in the North of England, Transport for the North (2017) – discussed in the Strategic Transport Plan (pages 68-72)

13. The challenge is to create build the travel markets required to connect people across the North in a sustainable way, by building on the growing market for rail and expand use across a wider subset of the population and in doing so, reduce dependency on private transport. Meeting that challenge requires:
- a. Fundamental transformation in the level of capacity on the North’s network, to deal with the current bottlenecks on the network, disentangle the current mix of freight, commuting and regional services on our congested network and create the resilience, reliability and flexibility needed to grow the markets for rail in the North.
 - b. Improvements in speed and frequency to bring more economic centres within realistic reach of key commuting and business travel markets, spreading the access to economic opportunities beyond those living in city centres. Together with HS2, NPR creates a powerful interconnected labour market with nearly 10 million people living within 90 minutes of multiple economic centres across the North of England.
 - c. Capitalising on a public transport revolution to change the way in which our towns and cities work, by harnessing the regeneration opportunities around stations, promoting active and sustainable travel to stations, creating new business districts and attractive places for people to live, work and play.
14. Much of that forward thinking has already been undertaken by Northern bodies through a series of publicly available plans. The Rail Needs Assessment should build on, not contradict those plans which include:
- a. The Northern Transport Strategy in 2015, prepared jointly by Government and the TfN Partnership.⁵
 - b. TfN’s Strategic Transport Plan and Long-Term Rail Strategy⁶.
 - c. The Manifesto for the North, developed by the NP11 and the Convention of the North⁷.
15. More widely, TfN’s partner authorities have already recognised the need for integrated planning of rail to maximise the benefits of TRU, HS2 and NPR for their local economies. For example, the Sheffield City Region Integrated Rail Plan (SCRIRP) published in 2019 notes that:
- “We need a clear plan of action, one that draws together planned national, pan-regional projects such as HS2 and Northern Powerhouse Rail (NPR) and local investment in community rail stations and transport interchanges. This Integrated Rail Plan is the first time we have brought these things together in one place.”*
16. The SCRIRP clearly sets out how rail fits within the SCR Transport Strategy and how rail fits with road and active travel development. It sets out an integrated programme for how the SCR’s rail network needs to develop and by when.
17. The Greater Manchester Rail Prospectus sets out a transformational approach to rail with four focus areas:
- “Making best use of what is available now. Rail services need to cope with growing demand in a cost-effective way, while improving comfort for passengers, reliability and punctuality. To meet these challenges, better use needs to be made of the rail infrastructure that already exists, such as by providing longer, higher capacity vehicles with simpler service patterns to improve reliability and punctuality.”*

⁵ The Northern Powerhouse, One Agenda, One Economy, One North (DfT and Transport for the North, March 2015)

⁶ Available at <http://www.transportforthenorth.com/reports>

⁷ <https://www.np11.org.uk/manifesto-for-the-north/>

Delivering more capacity and better connectivity. *To meet long-term growth in demand for rail-based travel to, from and within Greater Manchester, the capacity and connectivity of the whole network needs to be improved.*

A devolved and accountable rail-based network. *The rail industry must be re-structured to allow city-regions to make more decisions about stations and services for and on behalf of local people.*

Integrated travel between all modes. *Greater Manchester needs a fully integrated transport network that allows people to travel seamlessly between modes with simple, affordable ticketing. Rail and Metrolink services should connect well with each other and with the rest of the transport network, especially bus services, while supporting more walking and cycling.”*

18. Our partner authorities in the North have developed similar approaches e.g. in the Liverpool City Region, the North East and West Yorkshire. Authorities in north west England and North Wales developed the [Growth Track 360](#) programme of integrated investment. In the North East, Tees Valley and North Yorkshire, working with Network Rail as part of its Continuous Modular Strategic Planning process, a study has been concluded into ‘What is required to make the rail network between Church Fenton and Newcastle ready for the 2030s and beyond? This sets out a series of recommendations consistent with both NPR and HS2.
19. Those plans offer clear solutions for how to integrate projects and programmes that have been developed in isolation (including complementary investment in local rail, public transport, roads and active travel networks to be properly integrated with them). The Integrated Rail Plan therefore should build on that work with clear proposals for how national infrastructure can be designed and delivered in partnership with the North and its constituent authorities at Northern, regional and local level.
20. In the remainder of this document we have responded to the questions in the call for evidence. In line with the request to keep to 20 pages, the responses are deliberately short and refer to wider documentation already available. We would also encourage this response to be considered alongside those provided by our Northern partners and Midlands Connect.

Q1: What potential investments should be in scope of the Commission’s assessment of the rail needs of the Midlands and the north?

21. Whilst the Integrated Rail Plan is focused on major scheme development, we believe that the assessment by the Commission should take a broader view of the investment required to drive growth in the North and improve connectivity to the South, the Midlands, Wales and Scotland. To fully benefit from the Northern Powerhouse Rail improvements in capacity and connectivity, interventions need to look wider than just the cities, and allow those wider areas to interface with HS2.
22. There are four clear elements which should be considered:
 - Improvements identified through the Long-Term Rail Strategy that can deliver significant benefits quickly in terms of reliability and resilience to support the economic recovery and bring relief to existing passengers. TfN is already working closely with Network Rail and our partners to develop those proposals. The RNA should be mindful of the need for such a programme without needing to specify the detailed interventions required.
 - TfN investment programme schemes – including the existing schemes in development or already approved (such as the additional capacity at Piccadilly). These schemes should be considered a part of the IRP but as a package of interventions that complement and can be integrated with the RNA.

- The major schemes currently in development but not yet formally approved or optimised as a single programme – TRU, HS2 and NPR including interfaces between them (eg Crewe North Connection and Garforth) and where there are significant opportunities for alignment.
- Finally, consideration should be given to ensuring that the network is future proofed to allow connectivity requirements beyond 2040 to be incorporated when required⁸.

23. The following sections briefly set out the background to each of these elements.

Improvements to the North's existing railway network

24. Whilst the NIC's focus on connectivity and capacity is understandable as these are the headline items most often linked with economic gain, it is important to invest in reliability and resilience. The North of England has a number of constrained locations which lead to unreliability, caused by congestion and inflexible infrastructure, and this is often exported to other parts of the country. TfN will also work in partnership with Network Rail to identify opportunities to reduce the cost of the railway and make better use of existing assets. One way of doing this is to accelerate trains across the network by reducing journey times – not only does this make services more attractive to users, it also makes more efficient use of trains and crews. Together these factors make the railway more effective and more affordable.

TfN Investment Programme

25. TfN's Investment Programme sets out an ambitious programme which builds on the national infrastructure schemes such as NPR and HS2 with a series of other strategic road and rail interventions to connect the economic assets of the North. The schemes were identified through a series of ground-breaking corridor studies and are currently being assessed as a single programme⁹. The NIC RNA should take account of these schemes but not seek to prioritise between them. Many of which are already at an advanced stage and opportunities should be identified to accelerate them to aid the economic recovery¹⁰.

The TransPennine Route Upgrade

26. TransPennine Route Upgrade (TRU) represents the largest intervention within the next five year period for rail enhancements, with improvements concentrated on the north trans Pennine rail corridor serving Manchester and York via Huddersfield and Leeds. It provides East-West intercity connectivity across the North of England.

27. The direct journey time, capacity and performance benefits¹¹ brought by the scheme spread well beyond the bounds of the infrastructure investment itself to encompass the North East, Tees Valley,

⁸ For example, delivery of improvements to the Hope Valley line at Dore and Topley that provide for existing rail services and NPR, and the delivery of a Crewe hub station in 2027 that is future proofed for 2043 would realise significant cost efficiencies, minimise disruption to passengers and accelerate wider economic benefits in the surrounding area.

⁹ See pages 127 to 142 of the Strategic Transport Plan, and the Investment Programme report on the TfN Website.

¹⁰ to the Cumbrian Coast Line and Carlisle Station both of which have an OBC in development.

¹¹ TRU Client Development Remit outputs originally aimed to deliver a journey time of 40 minutes Manchester to Leeds (49 mins Dec 17); A journey time of 62 minutes Manchester to York (74 mins Dec 17); Capacity for 6 long distance trains per hour (comprising 4 fast and 2 semi-fast) whilst retaining the same frequency for local trains (up to 2 trains per hour) to call at local stations as provided in December 2017 existing freight rights to remain as present (3tpd & W8) with a further option for an hourly W10/12 freight path if possible

North Yorkshire, East Riding, the Liverpool City Region, and Edinburgh and South East Scotland. TRU offers significant economic impacts as well as delivering much needed reliability and capacity¹².

28. Transport for the North is not co-client for this scheme limiting our involvement and influence over key decisions. Whilst TfN strongly supports the high-level strategic outputs for TRU, a number of concerns remain:

- the interplay between TRU, NPR and HS2 which are complementary rather than competing schemes is not fully recognized in the development of TRU.
- The issues around freight and electrification which have significant implications for the decarbonisation of the railway network discussed later in this response. Full gauge clearance would enable to maximise freight movements along the TRU corridor to serve the North's key ports and international gateways through an integrated East - West "landbridge" corridor, avoiding the need to route modern containers on a standard rail wagon across the Pennines either via the Midlands or Scotland.

29. In January 2020 the TfN Board reiterated its support for this much needed investment on the north Trans Pennine rail corridor but noted the importance of how the planned and future phasing of TRU investment needs to form part of a coherent rail strategy for the North which takes account of the recognised interplay between TRU, NPR, HS2 and re-emphasised the need for investment to unlock key performance and congestion issues that will benefit the network across the North; and greater powers and influence over decisions affecting the North's rail network.

High Speed 2

30. Our submission to the Oakervee review¹³ set out the critical opportunities arising from HS2 when integrated with Northern Powerhouse Rail. Delivered in full, HS2 will be a key piece of world class infrastructure integral to the expansion of the existing rail network, regeneration of railway stations and their surrounding areas, and supporting the delivery of NPR, through shared infrastructure, released capacity and a step change in performance. HS2 is not just about access to London, it offers major opportunities to connect the North and Midlands. Delays in completing Phase 2b would have significant implications for the Midlands and the North's economies.

31. HS2 will carry over 300,000 passengers a day, releasing capacity on the existing rail network for both passenger and freight services by allowing parts of the existing West and East Coast Main Lines, and the Midland Main Line, to be used in different ways, growing the overall capability of the rail network to meet future need. How this released capacity can be used effectively to help the North's rail offer support the economy will be investigated through the Long-Term Rail Strategy and the development of NPR as integral components of a safe, dependable and responsive rail network.

Northern Powerhouse Rail

32. NPR represents a fast, frequent network operating between the city regions of the North of England and Manchester Airport. Whilst a number of options remain under consideration, the TfN Board agreed in 2019 that its preferred NPR network should be a combination of:

¹² it has been estimated by consultants Mott MacDonald (TRU Strategic Economic Narrative, Technical Note June 2018) that the regional impact of TRU could contribute towards 5,500 houses per annum; 18,300 jobs per annum; £1.1 billion of GVA per annum¹²

¹³ <https://transportfornorth.com/wp-content/uploads/Written-Submission-HS2-Review-26.09.2019.pdf>

- Improving the capacity and frequency of links between Liverpool and Manchester Piccadilly via Warrington and Manchester Airport using the HS2 infrastructure, a new line into Liverpool and a new integrated NPR/HS2 station in Liverpool.
 - A fully integrated hub station at Manchester Piccadilly and fast access to Manchester Airport from across the North.
 - Faster links between Manchester Bradford and Leeds via a new line serving central Bradford.
 - Significant upgrades along the corridor of the existing Hope Valley Line between Sheffield and Manchester (via Stockport).
 - Leeds to Sheffield delivered through HS2 Phase 2b and upgrading the route from Sheffield to/from the North.
 - Leeds to Newcastle via a junction off HS2 and significant upgrades to the East Coast Mainline corridor (via York, Darlington and Durham).
 - Significant upgrades to the existing lines from Leeds to Hull (via Selby) and Sheffield to Hull (via Doncaster and both Selby and Goole routes).
33. Development work on NPR has been underway for some time. A Strategic Outline Business Case (SOBC) was submitted to Government in March 2019 and this is being refined to inform a Strategic Outline Case (SOC) to be completed in 2021 which will set out a preferred network. This includes giving a recommendation on a number of key NPR/HS2 interfaces. There are however other areas where TfN and local partners are only a stakeholder and not currently involved in the consideration (for example the strategic importance of ensuring that places like Wigan are connected to the High Speed network, reducing the journey time to London from 115 minutes and 84 minutes). Additionally, in some areas particularly major stations, integrated plans are needed that consider the needs of HS2 and NPR along with the rest of the rail network.
34. Because of the fragmented approach to planning the rail network, these are not being pursued in an integrated manner and there is no long term programme. TfN welcomes the Oakervee Review's findings that HS2 and NPR need to be seen as a single network, recognising that much of the NPR network adds to or uses HS2 infrastructure. Both are needed – it is not an either/or choice – and both NPR and HS2 should be seen as equally important.
35. The key issues as we see them are summarised in the table below, with a commentary on the desired outcome and the extent of our involvement and knowledge in the process. In summary they are:
- Fragmentation – programmes have been developed in isolation, so each only provides what is needed for its own programme. For example, the HS2 routes into Leeds and Manchester have been designed around terminating stations which presents significant operational challenges for NPR and TRU which focus mainly on through services.
 - There is a lack of integration on the network. This fragmentation also leads to the possibility that capacity for growth in local services could be lost as other programmes are imposed. In some cases, building HS2 and NPR as planned could disadvantage places with current good connectivity and ways need to be found to back fill this loss.
 - There is also particular issue at Manchester Piccadilly, with the station designed to focus on the needs of HS2, rather than the combined needs of HS2 and NPR, which risks a sub-optimal solutions. The TfN Board have advised Government that the further option of the new underground solution for Piccadilly should also be considered through the Integrated Rail Plan.

Opportunities to better align HS2 and NPR

<i>Location</i>	<i>Issue</i>	<i>TfN Role</i>	<i>TfN Desired Outcome</i>	<i>How will this be achieved?</i>
Crewe	Major development within and around HS2 hub station, connection to NPR to bring it up to the standard of other HS2 hubs on the HS2 network funded from central government.	Stakeholder on Crewe Hub/HS2. Crewe North Connection (CNC) is part of NPR so co-client.	Enhanced Crewe Hub station and rail capacity delivered by 2027 to serve 5/7 HS2/ NPR tph.. Appropriate CNC solution identified funded and delivered at the same time or as part of the HS2 Phase 2b solution.	DfT, Network Rail and Cheshire East to progress and deliver the Enhanced Crewe Hub scheme and Access Package to ensure sufficient station capacity and support local regeneration and growth plans. NPR SOC to take forwards CNC and powers via HS2 Phase 2b hybrid bill.
Golborne Link	Link from HS2 to WCML for trains to Lancashire, Cumbria and Scotland. DfT have raised questions about its future.	Stakeholder	Solution that provides for North West and Scotland connectivity needs whilst also maintaining connectivity for Warrington and Wigan. Address key capacity constraint Crewe to Weaver Junction.	DfT and HS2 Ltd to ensure that any revised proposals are properly and transparently assessed.
HS2 North to Scotland	Links to Scotland by both East and West Coast routes	Stakeholder	Development plans for links between London, the North and Scotland including new and improved existing infrastructure	DfT and Transport Scotland to further consider
Liverpool Connections	High speed link between Liverpool and NPR and HS2 south, new station at Liverpool.	Co-client for NPR. Agreed that NPR will also provide the link to HS2.	Agreed concept that provides for Liverpool, serves Warrington appropriately and meets agreed journey time targets	NPR SOC will recommend a sifted concept that needs to be taken forwards to implementation
Manchester Airport	New station serving both HS2 and NPR is unfunded.	Stakeholder as station is provided by P2b	Station provided to cater for both HS2 and NPR that meets future passenger needs with sufficient highway access and passenger flow.	Station is taken forwards and funded as part of HS2.
Manchester Piccadilly	Integrated NPR, HS2 and Metrolink station, adjacent	Co-Client for NPR only. Stakeholder in station	Option developed that provides for future rail passenger needs, supports	The TfN Board have requested that the underground hub solution

	to current Network Rail station. NPR has considered a surface and underground option.	plans through local governance.	Manchester's wider development aspirations and avoids a sub-optimal solution for wider North.	proposals be assessed against the existing surface option as part of the IRP ¹⁴ .
Manchester to Leeds	A new or upgraded route is needed to cater for future demand and to further reduce journey times.	Co-client for NPR	New line via central Bradford, with Huddersfield benefitting from TRU investment.	NPR SOC will recommend a preferred option
Leeds Station	Integration of HS2, NPR and existing rail services	Co-client for NPR. Co-specifier of other rail services. Stakeholder on HS2.	Integrated station developed to support wider development aspirations. Needs a long term investment programme starting now to build up to NPR and HS2.	HS2 configuration is already known. NPR requirements are marginal. DfT needs to develop a long term investment plan.
Leeds to Newcastle	Mixture of four tracking, cut offs and significant upgrades to achieve agreed capacity and journey time outputs.	Co-client for NPR. Co-specifier of other rail services.	Integrated plan for development including existing network, stations and new sections including benefit for TRU by early delivery of NPR/HS2. Garforth touchpoint needs to be funded. Route to serve York, Darlington and Durham	NPR SOC will recommend a preferred option
Leeds to Hull	Upgrades to the existing network to achieve agreed outputs	Co-client for NPR. Co-specifier of other rail services.	Upgraded route that provides for faster and more frequent journeys	NPR SOC will recommend a preferred option
Manchester to Sheffield	Mixture of cut offs and upgrades to achieve agreed outputs.	Co-client for NPR. Co-specifier of other rail services.	Option developed that builds on planned upgrades and delivers sections early to benefit current rail services, e.g. Dore and Stockport.	NPR SOC will recommend a preferred option
Sheffield to Leeds	Upgrade to join HS2 at Clayton, with upgrade and	Co-client for NPR. Co-specifier of other rail	Early delivery of Rotherham and Dearne Valley Stations.	NPR SOC will recommend a preferred option

¹⁴ Confidential report by Richard George considered at the TfN Board on 12th March 2020.

	extension of Tram Train and 2 new stations	services.		
Sheffield Area	Little integration of HS2, NPR and rail development plans in the Sheffield area e.g. HS2 is only planning limited electrification of the station.	Co-client for NPR. Co-specifier of other rail services. Stakeholder on HS2	Integrated station developed to support wider development aspirations. Needs a long term investment programme starting now to build up to NPR and HS2.	NPR SOC will recommend NPR preferred option. DfT needs to develop a long term integrated investment plan to integrate CMSP findings, HS2 and NPR needs.
Sheffield to Hull	Upgrades to the existing network to achieve agreed outputs	Co-client for NPR. Co-specifier of other rail services.	Upgraded route that provides for faster and more frequent journeys	NPR SOC will recommend a preferred option

- As work develops, other interfaces may be developed. As an example, work has been undertaken in West Yorkshire to consider additional touchpoints with HS2 that could allow Wakefield and Bradford to be served directly.

Q2: Which set of rail investments do you believe would, together A) best unlock capacity within the Midlands and the North? B) best improve connectivity within the Midlands and the North?

37. Question 1 response identifies which interventions are required. These interventions now need to be planned together through an integrated programme that brings together all rail interventions, and other issues such as ticketing and major roads. The rail interventions are not discrete and have several interdependencies, for example:

- Infrastructure for the TRU may be re-used by NPR, or used in a different way to provide additional local services and or freight.
- There may be sections of HS2 and NPR that could be built earlier to benefit the TRU, e.g. East of Leeds (towards York, the North East and Hull, Darlington Station). TfN has advised the Government that early completion of the planned section of HS2 between Garforth and Church Fenton including the Garforth TouchPoint would be beneficial for the TRU and could be an early part of HS2/NPR that would have considerable benefit.
- At most major hub locations, investment is needed now to address capacity and reliability issues. An integrated plan of interventions is needed to provide for NPR, HS2 and TRU at these locations but also for growth in existing rail services. These plans need to be not-specific to one scheme or funding stream, but set out what investment is needed on what and when in specific locations. This includes the current and next Control Periods but extending as an identified future programme to ensure that capability is available when needed.
- It is important that NPR and HS2 are planned as part of the rail network and not in isolation to it. NPR and HS2 trains will extend on to the existing network and local and regional trains have an important role to feed passengers in and out of NPR and HS2. Whilst NPR and HS2 are vitally important programmes, if not planned in an integrated manner, there is a danger that they prevent could remove capability to accommodate growth in other rail services.
- NPR and HS2 will also release capacity on some parts of the existing rail network, allowing it to be used in different ways for both passenger and freight trains, allowing new opportunities and markets to be served. For example accelerating Northern Powerhouse Rail (NPR) and early delivery of HS2 can capitalise on spare East Coast Mainline capacity (enabling more direct London trains).
- Investments should be designed and delivered through a forward looking approach that reflects the wider plans for the network. Where possible, investments should be future proofed to realise significant cost savings to the taxpayer and minimise disruptions to passengers. For example, the delivery of HS2 Phase 2a works at Crewe hub should include the delivery of a revised track layout (G1.3c) via a major blockade and as such measures to ensure the station is able to accommodate future HS2 Phase 2b and NPR services and passenger demands should be implemented at the same time to capture cost and efficiency advantages and risk mitigation benefits of delivering the works at this time.

38. In addition there are significant opportunities to improve connectivity between the Midlands and the North through closer integration and early delivery of HS2 and NPR:

- There is potential to use HS2 Phase 2a to significantly improve links between the Midlands and the North for example between Birmingham and Manchester using HS2 Phase 2a to Crewe then the current rail network. This requires the commitment to a revised track layout at Crewe under HS2 Phase 2a works and Network Rail capacity solution (G1.3c) to accommodate this and the future HS2/ NPR 5/7 HS2 tph as well as improvements in connections to/from Shrewsbury,

Stoke-on-Trent and North Staffordshire.. This will also offer potential for much better links to Chester and North Wales. There are significant capacity issues at Stockport which act as a constraint to both the midlands and the North.

- Phase 2b can significantly address connectivity between the Midlands Yorkshire and the North East where journey times are not road competitive and rail use is low. For example TfN supports Midlands Connect’s plans for a Bedford – Leicester – Leeds service using HS2. This has potential to reduce the current Leicester – Leeds journey from 120 to 46 minutes.
- Currently rail takes 167 minutes from Bradford to Birmingham, with no direct connectivity. From Leeds rail takes 118 minutes. With NPR and HS2 these journeys are planned to reduce to 70 and 49 minutes respectively. Both Durham and Newcastle to Birmingham journey times reduce by 50 minutes with HS2 services, with the addition of NPR improvements on the ECML this would be further improved cutting journey times to less than 2 hours.

Q3: Within the set of investments you identified, which individual investment(s) should be the highest priority? Please explain your rationale for this and how this would affect the phasing and sequencing of the full set of investments you identified.

39. TfN’s position is that all the investments are needed. There is no implied priority, more a question of sequencing. NPR and HS2 both need to be delivered in full. Whilst NPR builds on HS2, the form of NPR needs to be what works best for the North, not what can be fitted on to current HS2 proposals. Phasing and delivery also needs to be integrated with the plans of our partners to maximise sustainable growth and minimise blight / disruption¹⁵. That said, there is a natural sequencing of interventions:

- In terms of capacity, completing the works outstanding in CP5 and CP6 – dealing with the problems of today and the long-promised schemes still to start. The TfN Board has highlighted the Castlefield Corridor in Manchester is the key place to begin unlocking growth potential across the North, but there are other significant bottlenecks on the network which also need to be addressed urgently, including at Leeds, the East Coast Main Line route to Newcastle and the North East, West Coast Main Line north of Crewe, the east Lancashire Line, Stockport and in the Sheffield City Region.
- It should also include urgent confirmation that Crewe hub and supporting infrastructure should be delivered as part of HS2 Phase 2a to realise the substantial cost and programme efficiencies, and deliver early benefits to the North from HS2.
- These initial projects are long overdue but also provide the foundations for pan Northern connectivity and growth in the longer distance markets, particularly between the midlands, North and Scotland for both freight and passengers¹⁶.
- In addition, there are significant opportunities to bring forward a range of investments already under development but not yet fully committed to by Government that could be rapidly accelerated and the scope confirmed as part of an integrated pipeline as soon as consents are in place. Many of those schemes are currently represented in the existing TfN Investment Programme.

¹⁵ For example the development work on Northern Powerhouse Rail is being integrated with tram train development in Sheffield City Region and Greater Manchester (see respective Rail Plans f

¹⁶ For example re-enabling freight services between Blackpool and Glasgow

- These pinchpoints are also limiting growth in local and regional services to address congestion on existing services. Stockport being a prime example where 3 additional tph included in the Northern have not been able to be delivered. It also impacts on the HS2 TSS, with the business case assuming in all phases a service terminating only as far North as Macclesfield via Stafford and Stoke-on-Trent, when services are heavily overcrowded in and out of Manchester with the level of demand on this corridor. It is a missed opportunity for connectivity between the rail interchanges of Manchester and Stockport, with Macclesfield, Stoke-on-Trent, and Stafford.
- Furthermore, there are large elements of both NPR and HS2 which if brought forward could act as significant improvements in their own right, ahead of the main work needed on new line development.
- Finally we should recognise that the new line routes for NPR and HS2 are likely to take the longest to develop, consent and construct. To be completed no later than 2040, it is vital that all other upgrade and improvement work happens ahead of new line development, so that the completed network is fully operational as soon as possible.

40. Recognising that NPR is a whole network, we are now considering how the delivery of the full programme should be sequenced. The rationale for this sequence is an agreed set of priorities agreed by the TfN Board. As a statutory body, we have clear governance arrangements for Northern Leaders to take decisions on behalf of the North. To inform the phasing development, six “Pillars”, or potential constraining factors, have been identified which are

- Pillar 1: Consents
- Pillar 2: Expenditure Profile
- Pillar 3: Supply Chain
- Pillar 4: External Dependencies
- Pillar 5: Customer Disruption/Integration¹⁷
- Pillar 6: Benefits Realisation

41. As the evidence on NPR begins to emerge over the summer, TfN will provide the NIC with a blueprint for a single, integrated pipeline of rail investment across the North using the same broad approach being taken for NPR. That blueprint will focus on the following key principles:

- Acceleration of business case development on NPR and early delivery of key HS2/NPR infrastructure
- Synergies – the key opportunities to align NPR, HS2 and TRU interventions, particularly between the Liverpool and York, as well as the corridor extending to the North East, ECML and WCML
- Integration – between the major Northern/Midlands schemes, the conventional network and existing “quick wins” in CP6 and CP7. The outcome needs to be a continuous pipeline of investment from now to 2040, starting immediately with focus on Manchester and Leeds hubs.

¹⁷ Need to ensure that phasing / delivery needs to be integrated with Local Partners to maximise sustainable growth and minimise blight / disruption. In particular - schemes such as tram train where there are key dependencies with other major schemes such as HS2 and NPR, need to be considered in the phasing.

Q4: What supporting policies need to be in place to deliver the benefits of the investments you identified? If there are any dependencies with other investments/policies, how confident are you that these supporting policies will be put in place?

42. The rail opportunity in the North and the Midlands is to bring cities and economic centres closer together to help the regions function more like a unified economy that has the size and scale to compete globally with the most productive and prosperous places around the world. A truly connected North will drive business productivity which creates a virtuous cycle of greater investment and higher skilled jobs locating to the region. NPR and HS2 together presents a unique opportunity to open up access to a wider range of job opportunities and bring prosperity to places across the North. In our local economic plans and strategies, including the STP, the North is already preparing for the arrival of NPR and HS2.
43. The investment in transport infrastructure must be complemented by changes in Government policy to support the Northern Powerhouse agenda – particularly in skills, housing and place-making ,and better joining up of infrastructure investment across Government to ensure that the benefits of rail investment in maximised. This should involve taking a place-based approach to key locations across the North, built around the key economic strengths and assets such as the clean energy sector and advanced manufacturing¹⁸.
44. Additional investments required fall into three categories:
- The wider package of pan Northern transport investments identified in the Strategic Transport Plan that can connect people businesses and freight into the rail network. Providing better connections at a pan-Northern level, particularly connections between the North’s existing and future economic assets and clusters, will create jobs and generate growth.¹⁹
 - **Local connectivity** - of particular importance in encouraging a mode shift towards rail, will be the need to ensure effective connections to new and existing rail stations by all modes, and the provision of adequate access facilities, such as parking (as appropriate) and drop-off/pick up provision, electric charging points, bus facilities and secure cycle parking. It also includes development of new mass transit systems in appropriate locations. How local rail stations are managed can also aid integration and will also be a key part of future rail franchises. TfN’s authority partners have a clear role to play in ensuring that credible place based proposals are brought forward to complement pan Northern investments in rail.
 - The **wider local growth plans** and emerging **local industrial strategies** reflect the overarching recommendation of the NIC Infrastructure Assessment, that both regional and local connectivity is required to drive economic transformation in the biggest cities. Alongside investment in transport, Local Economic Plans identify what else needs to be done to achieve transformation. This requires input and investment from both the public and private sectors with an initial focus on:
 - Accelerating house building in the right locations.

¹⁸ Significant work has been done through TfN and the LEPs on innovation and clustering driven by strategic connectivity improvements – for example the Advanced Manufacturing Corridor between the North West and Sheffield City Region, and TfN’s work on connecting the energy coasts outlined in the STP.

¹⁹ TfN have developed and published a number of strategic development corridor studies as outlined in the Strategic Transport Plan and frame the TfN investment programme.

- Investing in skills, particularly linked to the capabilities and growth industries in each area. This is described as requiring greater devolution to enable bespoke programmes to be developed to match local needs.
- Improving public realm around stations and approaches
- Attraction of inward investment by world-leading, international businesses that can bring transformed business practices and access to leading technologies
- Business support activity to nurture new and growing businesses, support research, development and innovation.
- Unlocking new funding mechanisms that can drive local growth and accelerate investment, predominantly in infrastructure.
- Creating a more inclusive economy, with benefits distributed across the wide range of places and communities in the North of England. This includes the more rural economies which need to be connected to the rail network, both to benefit from the North’s strong visitor economy and to ensure inclusive access to opportunities and prosperity.

45. For NPR, TfN Board said that the Government should recognise the critical role of NPR in regeneration and growth, working with the NP11 to refresh the Northern Powerhouse Strategy and provide funding to develop NPR Growth Strategies. The approach to assessing place based interventions should be led locally, supported by TfN as required, and based on a broader appraisal of economic impact (building on commitments to review the Green Book approach). Whilst HS2 Growth Strategies have made some progress in this area, the approach should be broadened to all economic centres in the North, with a clearer response from Government.

References:

- HS2 and Northern Powerhouse Rail Growth Strategy, GMCA²⁰
- NPR Growth Strategy for Bradford, Bradford MBDC²¹
- High Speed Rail – linking Liverpool, Liverpool City Region²²
- Sheffield Midland Station and Sheaf Valley Development Framework, Sheffield CC²³
- Crewe Hub HS2 Masterplan, Cheshire East Council²⁴
- Tees Valley Investment Plan 2019-29, Tees Valley Combined Authority²⁵

²⁰ The HS2 Growth Strategy for Greater Manchester is underpinned by a wider spatial regeneration framework for Piccadilly and other related frameworks, including the GM spatial framework and the Local Industrial Strategy for Greater Manchester.

²¹ https://www.nextstopbradford.com/wp-content/uploads/2019/03/NPR_Bradford_Growth_Strategy.pdf

²² <https://www.liverpoolcityregion-ca.gov.uk/wp-content/uploads/Linking-Liverpool-Economic-Benefits-evidence-compend...pdf>

²³

http://democracy.sheffield.gov.uk/documents/s38895/Midland%20Station%20Development%20Framework%20Summary.pdf?fbclid=IwAR0iB4zccbKNsHXAIROJfAWwoEs2dMUEQcgwI3uTAbN3JMD5PMOZy_1MJ3o

²⁴ <https://moderngov.cheshireeast.gov.uk/documents/s59543/Crewe%20HS2%20Masterplan%20-%20app%202.pdf>

²⁵ <https://teesvalley-ca.gov.uk/wp-content/uploads/2019/03/Investment-Plan-2019-20-Digital.pdf>

Q5: What impact would the investments you identified have on greenhouse gas emissions? In particular, how would they affect the UK's ability to meet its domestic and international targets, including the Paris Agreement and net-zero? AND

Q6: In addition to greenhouse gas emissions, what are the potential environmental effects (positive and negative) of the investments you identified?

46. Tackling the climate emergency must be at the heart of the Integrated Rail Plan. Rail as part of a wider, door to door transport network, has a vital role to play in enabling people to make more sustainable journeys. Transport is the largest greenhouse gas emitting sector, accounting for 28% of all UK greenhouse gas emissions in 2017. Transport has a significant role to play in meeting commitments to reduce greenhouse gas emissions, in particular carbon emissions. TfN's role is to significantly improve connectivity between economic centres whilst growing the market for public transport and reducing the impact on the built and natural environment.
47. **Electrification of rail** is a key pillar of the approach to decarbonisation. Electric trains are cheaper to operate and have better acceleration and deceleration leading to journey time savings. In the North, the East and West Coast main lines are electrified (although available power is below future needs and is already a constraint on the number of electric trains that can operate) as are regional routes around Liverpool, Manchester and Leeds, complemented by electric tram and light rail services in Manchester, Sheffield, Blackpool and the North East.
48. There are however significant gaps in electrification in the North. There is no electrified route crossing the Pennines, the Midland Main Line remains diesel operated and east of Leeds no routes are electrified other than the East Coast Main Line²⁶. As a result, new diesel and bi-modal trains have been introduced by several operators in the North. Most freight trains in the north are diesel hauled because the electrified network is generally passenger-focused and does not extend to major freight destinations. TfN are working closely with Network Rail to ensure the study looking at the options for the different routes across the Pennines is commenced in the Autumn and we look forward to working with Network Rail to understand the outcomes.
49. The TRU programme presents a real opportunity to deliver full electrification and gauge clearance of the Diggle corridor with complementary investment in passing loops on parallel corridors such as Calder Valley as part of a rolling programme of electrification across the North of England that would be a cost-effective way to invest in the decarbonisation of the existing network.
50. The move away from a partial electrification option for the TRU corridor to a full electrification one would ultimately support a number of environmental as well as economic benefits and could prove to be the catalyst for a rolling programme of electrification across the North on intensively used routes maximising significant efficiency savings through the retention and use of skills, plant and machinery.
51. Electrification of main rail routes will make a significant contribution to decarbonisation. There are also other initiatives that may be capable of introduction in the shorter term. Bi-modal electric/diesel trains already operate in the North and there is significant work to develop Hydrogen fuelled trains, which are zero-emission at point of use and with proposals to trial in the Tees Valley being investigated and calls by North East Lincolnshire for a trial between Barton and Cleethorpes. There is also potential for infill electrification of some routes in advance of a wider implementation.

²⁶ Electrification of the route between Selby and Hull was cancelled in 2016, now forms part of Northern Powerhouse Rail and could be accelerated. Electrification of Leeds to Selby was previously part of TRU and should be reinstated to fully electrify the Leeds to Hull corridor..

52. Other factors which should be considered through the RNA:

- Making rail more attractive (both to passengers and freight) is a key tool in mode shift, and hence in reducing carbon and other emissions. Reducing emissions from rail needs to be considered alongside better station accessibility, park & ride, sustainable travel links which would all help to encourage people to leave their cars at home.
- Minimising the negative environmental impacts of building new routes or through construction needs to be mitigated through the design and development of these schemes, including noise and a wide range of other potentially negative factors. This also supports the need for the right delivery mechanisms to support mitigating impacts.
- Finally, greater use of the North's ports offers net UK emissions benefits; but this improved rail access to ports would likely be a prerequisite to minimise this increased freight being distributed by road.

53. Decarbonisation of rail is part of wider TfN plans to take forwards the decarbonisation agenda. As part of its commitment to develop an Inclusive and Sustainable Growth Framework, TfN will lead the scoping, developing and implementing of a 'Pathway to 2050'.

54. TfN's 'Pathway to 2050' will set out a clear programme of phased introduction and implementation of key policies and measures through the interventions promoted, and their projected contribution to meeting carbon budget targets, through to 2050. TfN commits that the scale and type of programmes and interventions, and underpinning scenarios, will if necessary be adjusted in order to be consistent with the 'Pathway to 2050' over the lifetime of the Strategic Transport Plan. A programme of scenario development and detailed modelling is being undertaken and will be shared separately with the Commission during Summer 2020.

55. Our early analysis demonstrates what's possible. The NPR Business Case identifies significant opportunities for mode shift from cars and therefore a wide range of emissions. The main detailed assessment is taken from the initial analysis of NPR and shows:

- increasing demand for rail as a result of NPR means fewer trips by car, resulting in benefits from reduced emissions of air pollution and greenhouse gases. The initial assessment of these impacts is relatively conservative and assumes a smaller reduction in car-km that is 30% of this rail increase (in line with WebTAG guidance); and the impacts on congestion, noise, accidents, air pollution and greenhouse gases estimated.
- These factors do not take account of location-specific factors that may be important in determining the true scale of the impact. Despite this limitation, it is still useful to consider the potential scale of mode shift brought about by NPR. The methods above suggest reductions in road traffic by around 800 million car-km per year, equivalent to taking around 64,000 cars off the road

56. This analysis will be updated later in 2020 as part of the work on the new business case due for submission in early 2021.

Q7: Aside from those delivered by improved connectivity and greater capacity, what broader impacts on people's quality of life could the investments you identified have?

57. By improving connectivity to key leisure destinations across the North, NPR and HS2 will have a positive impact on the tourism and leisure sector for the following reasons:

- The growth in rail travel has come from increases in off-peak travel during the last two decades. This shows that rail is likely to have become an increasingly attractive mode for leisure trips. The

dynamic and growing visitor economy means that NPR and HS2 will further support and facilitate growth in the off-peak and weekend leisure markets.

- Northern cities are central to the visitor economy. Liverpool, York and Manchester are in the top seven places visited in the UK by overseas visitors. By offering better linkages to these cities, including to international gateways, the cities will see benefits to their visitor economy.
- Other tourist destinations outside of the Northern cities can also benefit from NPR and HS2. Journey times to Scarborough, Blackpool and other critical tourist economy destinations (such as key gateways to the national parks) will be significantly improved by NPR and HS2, provided investment is made in ensuring onward connectivity, particularly for more rural destinations.
- Enhanced connectivity to retail and leisure destinations will encourage investments in other places and help spread the employment opportunities of NPR across a wider subset of the population.
- The population across the North as well as businesses in the retail, hospitality and tourism sectors will benefit from improved connectivity to leisure and tourism destinations.
- Rail links to international passenger gateways such as airports and ports are also important to support the visitor economy

58. The evidence on how transport shapes the growth of cities and places is well established²⁷. In bringing people, places, business and public institutions closer together, NPR and HS2 represent a clear opportunity for transforming the way economic centres are used, facilitate regeneration and development opportunities and create dynamic and attractive places:

- TfN have developed an innovative approach²⁸ that can estimate the impact of a transport improvement on changes in the attractiveness of different locations. This should incorporate transport user benefits, land-value uplift and wider economic impacts into a single metric, without double-counting.
- Analysis of NPR shows significant additional ‘place attractiveness’ benefits over and above the user benefits and agglomeration benefits captured by conventional appraisal. These estimates are indicative of the additional potential benefits realised through NPR making locations in the North more attractive to households and businesses.

Q8: How would the costs and benefits of the investments you identified be distributed economically, socially and geographically?

59. TfN believes that investment in rail is essential to deliver an inclusive and sustainable North. Supported by earlier interventions (which should focus on reliability, capacity and building the key rail markets) TRU, HS2 and NPR will significantly transform journey times right across the North for a range of key economic centres, demonstrating the benefits of NPR will be felt beyond the immediate cities and intermediate markets directly served by NPR and HS2²⁹.

²⁷ Recent work by CEPR shows how dramatically the steam rail revolution in the nineteenth century shaped London as a major economic force <https://voxeu.org/article/making-modern-metropolis-evidence-london>.

²⁸ <https://transportforthenorth.com/wp-content/uploads/LVT-Phase-2-Final-Report-ITS-2019.pdf>

²⁹ https://transportforthenorth.com/wp-content/uploads/Potential-of-NPR_TfN-web.pdf

60. Illustrative examples of pan Northern journey times derived from the rail modelling work include:
- Journey times from Middlesbrough to the West are faster by 40 minutes to Manchester, 50 minutes to Liverpool, Blackpool and Carlisle;
 - Sunderland services nearly an hour faster to Manchester (currently 3hrs);
 - With TRU and HS2 in place, journey times from Darlington and Durham will be around 20 minutes quicker to Manchester, and around 45 minutes faster to Crewe. With NPR that improves further to 50 minutes and 70 minutes respectively;
 - Lancaster journeys are faster to Sheffield (20 mins), Hull (47 mins) and York (40mins);
 - York to Crewe - currently takes 2hrs 30mins. With TRU and HS2 that reduces by 30 mins but is a full hour faster with NPR;
 - Warrington to Leeds 26 minutes faster, Newcastle 45 minutes faster;
 - Journeys from Hull to Liverpool will be 72 minutes faster from today, 70 minutes faster to Crewe and 90 minutes to Runcorn.
61. Increased frequency and speed offer a radical step change in accessibility to key economic centres:
- Compared to the "do minimum" position, NPR delivers a substantial change in access to key economic centres and provides the interconnected North that can drive growth.
 - Access to city centres is radically improved, increasing the population catchments of the largest cities by between 30% and 40% for most cities, over and above the planned and committed improvements. Compared to today, around 3 million more people will have access to Sheffield within 90 mins, 4 million will have access to Leeds and 3 million to Manchester.
 - In a transformed North, with increased population and growth, those increases are larger, with 1.6 million people able to access multiple places within an hour by 2050 compared with just 52,000 today. At 90 mins, nearly 10 million people (9.6m or over half of the North) will have that access, against just 2 million today.
62. Conventional rail is one of the most effective ways to improve access opportunities for people in the North. The ability of conventional rail to enable people to travel longer distances relatively quickly also provides the significant potential to increase the catchment areas of key economic centres and provides more people with access to a greater number of those centres. This can substantially increase the number of people who have access to jobs or other businesses within a 60 or 90 minute time frame. Analysis has also shown that most of the growth in the key capabilities of the Northern economy identified by the NPIER will be concentrated in key economic centres. The analysis shows that across the NPIER capability sectors, there is a higher tendency to travel by rail when compared to the national average.
63. To transform the economic performance of the North, the most productive businesses and high skilled individuals need access to places, and rail is the preferred mode of choice for those groups. Recent analysis by TfN of the National Travel Survey indicates that people belonging to groups that are in middle or high income full-time employment are more likely to travel further and are more likely to use rail.
64. However, rail investment can drive inclusive and sustainable growth more widely across the North but only as part of a wider strategy focused on regeneration, place making and skills that can benefit wider communities and a range of different groups. The social distribution of benefits, where will these interventions enable our more deprived communities to gain from job creation, accessibility and environmental improvements.

65. For example, delivery of the right solution at Crewe station (G1.3c) would enable the geographical reach of HS2 and NPR to be distributed much further through Cheshire, Staffordshire and North Wales. In addition the extension of platform 5 to enable the splitting and joining of HS2 trains allows a classic compatible service to call at Stoke-on-Trent, Stafford and Macclesfield which each have issues of deprivation compared with their surrounding geographies.

66. That can be best achieved by:

- Delivering the broader growth strategies outlined in Question 4, with a particular focus on housing, skills and inclusive growth. The NPR Growth Strategy work undertaken by Bradford is an excellent example of a holistic approach to strategic planning³⁰.
- Integration of NPR and HS2 with the conventional rail network and opportunities to upgrade the existing network and align with other investments such as the reopening of Beeching lines (e.g. to Fleetwood, and reopening the York to Beverley line through East Yorkshire)
- A wider example is the need to ensure connectivity from Lancashire and Cumbria into the NPR network as part of the West Coast to Sheffield City Region corridor but also recognition of the broader need for greater east- west connectivity beyond NPR in particular the importance of the Central Pennines corridor (Preston/Blackburn/Burnley/Leeds) including the reinstatement of the line linking Colne and Skipton.
- Moreover, the importance of the railway network in connecting rural communities, particularly in areas with limited long distance bus services. For instance, improvements to the Cumbrian Coast and Furness Line will provide significant benefit to the local population, improving connectivity and providing a real choice for those without access to a car. Many rural areas (such as in West and South Cumbria) are amongst the most deprived in the county, and rail enhancements can provide more opportunities and bring jobs and services closer.

Q9: Which set of investments would best improve rail connectivity with Scotland?

67. TfN's innovative work on strategic development corridors (outlined on pages 126-141 of the Strategic Transport Plan) emphasises the need for close economic links to Scotland and connectivity through both the West and East Coast Mainlines.

68. The key TfN priorities for this review include:

- Any proposed changes to the Eastern leg of HS2 should be mindful of the knock-on consequences of slowing the Eastern leg through the midlands for longer distance journey times (both to the North East and Scotland)³¹.
- Address capacity issues on the WCML north of Golborne and to also ensure that journey times across the northern part of the WCML are not worsened under HS2 because of the lower line speed for non-tilting trains.
- A longer term strategic plan should be identified for extending HS2 all the way to Scotland in future, including the integration with NPR to improve both North West and North East to Scotland connectivity and ensuring that both the WCML and ECML are future proofed as the ECML upgrades to Newcastle through NPR³².

³⁰ Northern Powerhouse Rail Growth Strategy, Bradford (2019)

³¹ For a comprehensive overview of the evidence, see <http://www.hs2east.co.uk/>

³² As recommended by High Speed East

- The importance of capacity on the WCML to Scotland, including for freight (with many stretches of line that are just two tracks). The current HS2 proposals would help in this regards at least as far as Wigan, though there would still be issues needing to be dealt with further north.
- The importance to the economy of Lancashire of connectivity to the High Speed network. Figures highlighted in 2016 recognised that in the long-term, productivity gains from HS2 could help provide an extra £600m for the Lancashire LEP region and 3,000 additional jobs in Preston and South Ribble. In Preston itself, HS2 could mean 75,000 extra visitors a year, adding £3.3m to the city's economy annually³³.
- The need to develop Preston and Carlisle stations as key hubs on the rail network in the North West- not just getting it HS2 ready but recognising the role they play as important WCML interchange stations for north-south and east-west movements
- The Borderlands Partnership has been established to unlock the potential for sustainable and inclusive economic growth across the South of Scotland and North of England. The extension of the Borders Railway to Cumbria offers further opportunities to strengthen cross border connectivity, and is included in TfN's agreed Investment Programme.

Q10: What would be the impact of the investments you identified on connectivity between the Midlands and the North, and other parts of the UK?

69. Some of the significant benefits of HS2 and NPR connectivity are set out in the response to Q4, in terms of improving journey times between the Midlands, North and the rest of the UK. Separately, work by HS2 and reported in the Oakervee review has demonstrated the clear journey time benefits as well as the accessibility benefits for millions of people in the Midlands and the North³⁴. Rather than repeat that analysis here, we would offer the following observations:

- Firstly that the work by HS2 Ltd and others demonstrates the fundamental importance of connecting cities in the Midlands to Yorkshire, the North East and Scotland by the Eastern Leg of Phase 2b. No other solution being proposed offers the level of connectivity to such a large proportion of the UK population.
- Secondly that the issues raised in the Oakervee review in relation to the scope and design standards of the Eastern leg must be resolved without delay. The speed and capacity of the route through the Midlands has fundamental implications on North South connectivity for Sheffield, Leeds, York, Newcastle and the Tees Valley.
- Thirdly we would note that whilst NPR has been assessed for transformational economic impacts (using TfN's analytical framework) in the SOBC, the equivalent analysis for HS2 remains incomplete and therefore incomparable. In our view an integrated assessment of the combined impact of both schemes is now essential for the Integrated Rail Plan. TfN is ready to work with the Commission, Midlands Connect, DfT and HS2 Ltd on that joint assessment as a matter of urgency³⁵.

³³ <https://www.lancashirebusinessview.co.uk/latest-news-and-features/new-report-shows-hs2-already-embedded-in-prestons-growth-plans>

³⁴ Insert references to HS2 Eastern analysis

³⁵ Work commissioned by Liverpool City Region on the economic impact of an NPR/HS2 line to Liverpool is one of few examples.

Q11: What would be the impact of the investments you identified on international connectivity across the Midlands and the north?

70. In this section we cover both freight and international connectivity issues. TfN recognises the strategic importance of the rail network for both passengers and freight services. The freight and logistics industry is recognised as a key enabling sector in the North. The key challenges that the IRP will need to address for freight are ensuring that not only the North’s networks can accommodate growth but that the national network can do the same.

Freight

71. Freight rarely respects boundaries applied to any geography so the Integrated Rail Plan will need to reflect the strong relationships with other parts of the UK, Europe and beyond. Key challenges that need addressing include electrified port access, freight hub access, new freight terminals, electrification, gauge clearance on classic and freight network, availability of traction engines, modal shift and decarbonisation.
72. Access to global trade opportunities will need consideration too. Following Brexit, there needs to be a measured response to understanding the capacity required should the Southern ports become challenged by the volume of traffic and the associated checks that will be required.
73. For freight, there is a need to reduce journey times to make transport by rail more competitive and attractive compared to other modes and greater flexibility with train paths so that goods can be moved when suppliers or customers require them. For the end-to-end freight journey to be as efficient as possible, the North needs better surface access to ports, airports, and intermodal terminals. There are some significant potential rail freight flows where existing network capacity and capability pose constraints. There are currently no suitable routes across the Pennines that can accommodate the largest inter-modal deep-sea shipping containers on standard wagons³⁶.
74. There are many examples of rail freight journey times being slow, often due to circuitous route requirements. This can be due to a number of factors, including high infrastructure utilisation (which can reduce the availability of paths), gauge clearance and route capability constraints. Slow journey times erode rail’s commercial competitiveness versus road transportation and serve as a barrier to attracting traffic to rail. Freight journey times must become quicker if the rail network is to facilitate and accommodate the requirements of the growing economy.
75. Where freight services operate, paths are timed to take account of slower speeds due to weight and length, and as such they utilise more infrastructure capacity. Unlike passenger services, freight trains only operate when there is a need to do so, meaning that paths may not always be utilised. In some cases, services cease entirely but the path is retained in the timetable to provide capacity should services recommence, or should the operator wish to trade the path with a competitor. These issues are furthered by conflicts which require freights to give way to overtaking passenger trains, leading to delays from deceleration, waiting, and acceleration, which in turn impacts costs.

A prime example is the Drax biomass fired power station near Leeds which can process up to 12m tonnes of biomass a year, which is delivered by up to 14trains per day, and provides around 5% of the country’s energy needs. Biomass, in the form of compressed wood pellets, is imported via the Port of Liverpool through a £100m custom

³⁶ East Riding of Yorkshire Council would want to see lines into the ports of Hull and Goole gauge cleared for the largest standard containers. This would assist in decarbonising freight and help maintain the competitiveness of the Humber Ports.

built import terminal and transported by rail to the Drax plant. But because of insufficient capacity each train generally takes over seven hours, and often as long as 10 hours, to travel the 90 miles across the Pennines.

76. TfN's Enhanced Freight and Logistics Analysis identifies further capacity pinch-points on the network, which could constrain the growth of freight services if not addressed. These include:
- WCML between Weaver Junction and Liverpool (particularly towards the Port of Liverpool and the intermodal freight terminals at Garston and Widnes/Ditton) as well as between Crewe and Manchester (particularly towards Trafford Park and through the congested Platforms 13 and 14 at Manchester Piccadilly)
 - East Coast Main Line (ECML) between Doncaster and Newark; the ECML Leeds - Wakefield – Doncaster and around Northallerton
 - The Midlands Main Line south of Sheffield and through Chesterfield
 - The Cumbrian Coast Line between Carlisle and Sellafield
 - The trans-Pennine routes, particularly between Manchester and Huddersfield (however alternative east-west routes may be more appropriate).

Connectivity to international gateways

77. In a globalised economy, business connectivity to key international ports and airports is an important factor in attracting greater inward investment and allowing businesses in the North to find new markets and more easily trade with the rest of the world. Creating a larger/stronger catchment for our airports will support growing the range and frequency of international connections which can then drive further growth right across the North.
78. Connectivity to Manchester Airport as the key global gateway, alongside improving connectivity to other Northern airports is key to this. International connectivity through Manchester and our other airports supports the visitor economy, and universities, attracting international students and world-leading academics, encouraging knowledge exchange and research partnerships with the world's best academic institutions. It is also the case that one of the North's key enabling capabilities, logistics, can be constrained, especially through poor access to the rail network. Creating new transport networks can create capacity that this sector can capitalise on, including ensuring that the ports in the North of England have the opportunity to play a larger role in UK trade.
79. Manchester Airport sits at the heart of the integrated NPR and HS2 network. A new airport station will provide faster, more frequent journeys between the airport and a wide range of destinations across the North. The combined impact of HS2 and NPR mean that the population of the North alone are able to access the new Manchester Airport Station within an hour by rail increases from 2m today to 4.7m with HS2 and NPR, and within 90 minutes by 4 million to 8.7m - over half of the North's population.
- NPR will improve access to the world via dramatically improved links to its primary international gateway. NPR will not only encourage the further development of long-haul and business routes from Manchester, both in terms of new destinations and greater choice and frequencies to existing destinations, but also mitigate pressure on the constrained London system and transport networks by reducing leakage of air passengers from the North. Whilst NPR and HS2 will transform connectivity to Manchester Airport, current connectivity to the South and West by rail is limited so there is a need for short and medium term improvements.
 - The International Connectivity Commission (2017) found that whilst passenger numbers have grown significantly across the North, including Doncaster-Sheffield, Newcastle, Liverpool and

Manchester, opportunities for further expansion are possible due to untapped potential. The North's key airports are capable of delivering an additional 60 million passengers per annum³⁷.

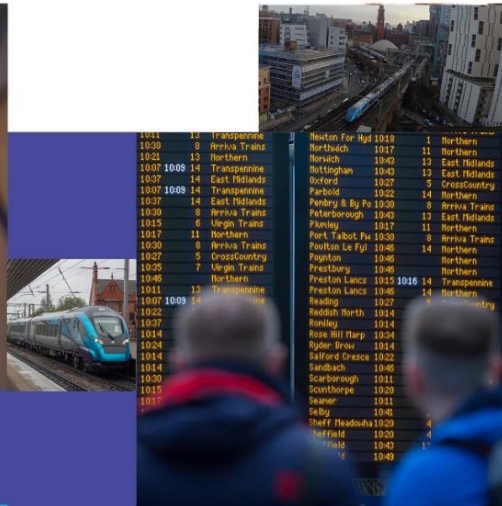
- International connectivity also plays a significant role in driving tourism and culture, allowing international visitors ready access into and across the North of England (eg: the Manchester Airport to Windermere route is a critical link to the Lake District World Heritage Site. For Northern residents, external connectivity is also an important part of its quality of life offer.

Case study: TRU and freight connectivity to Ports

80. *Ports such as Immingham, Hull, Tees and Liverpool have seen previously considerable volumes of coal and ore diminish rapidly and have made concerted - and successful - efforts to attract replacement business in the form of containers. e.g. growth in container traffic into and out of Teesport, has increased by an average of 7% per annum over the last 5 years.*
81. *The potential of increased use of Northern Ports offers significant benefits to the UK, including reducing current and future congestion on crowded London and Southeast infrastructure. The port of Liverpool is a key asset within the LCR Local Industrial Strategy, especially in the light of opportunities post-Brexit – and is already the country's biggest port for trade with the USA.*
82. *These containers originate from both Continental Europe and Scandinavia ('Short Sea') and the rest of the World ('Deep Sea'), the latter usually being moved on feeder sailings from ports such as Rotterdam. There are now around a dozen Short Sea and Feeder sailings a day into/out of East Coast ports, with further sailings into Liverpool. In all cases, the number of sailings is forecast to increase further, not least because of congestion at Dover.*
83. *Liverpool also sees calls by large Deep-Sea vessels - notably from the USA - as well as other locations from across America, Africa and Asia. The recent private-sector led investment in Liverpool 2, an on-river terminal that can handle the world's largest container ships, has already seen vessels which traditionally have only called at Southampton, London Gateway and Felixstowe start to serve Liverpool, and there is increasing interest in this. Often these vessels can carry over 12,000 containers. Liverpool is also one of the largest ports in Britain for trade with the island of Ireland, with multiple sailings a day, conveying both driver-accompanied and unaccompanied trailers, with ships that can carry up to 3,100 lane metres of freight. The port of Immingham and its switch from coal to deep sea containers offers linkages to Liverpool for trade between the USA and Europe, especially beneficial post-Brexit.*
84. *Many companies are realising that, for a significant proportion of their imports from the Continent, it is not necessary for a lorry to be driven across Europe, over the Straits of Dover and up the M1 and/or M6. An unaccompanied unit, sometimes a trailer but increasingly a container, shipped to a Northern port can be a more cost-effective and environmentally sustainable option, particularly as the haul to a Continental port is often made by rail.*
85. *The ability of a 60' long standard height wagon to convey a 40' and a 20' container (i.e. two HGV loads on one wagon) in long efficiently loaded trains - a 'wall of containers' - is fundamental in maximising rail efficiency and competitiveness in the movement of Deep Sea containers. In the Transpennine context, Liverpool is overwhelmingly a Deep Sea port and Deep Sea containers also form a proportion of the total at Immingham and Tees. It remains the case that W10/12 must be the strategic objective for traffic from these locations, so that the complete traffic mix can be efficiently consigned by rail.*

³⁷ Independent International Connectivity Commission Report (2017) Transport for the North

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10:41	10	Transpennine	Heston For Hylt	10:18	1	Northern
10:50	9	Arriva Trains	Northwich	10:17	11	Northern
10:21	10	Northern	Bowthorpe	10:40	13	East Midlands
10:07 10:09	14	Transpennine	Nottingham	10:40	13	East Midlands
10:37	14	East Midlands	Oxford	10:27	5	CrossCountry
10:07 10:08	14	Transpennine	Penrith	10:22	14	Northern
10:37	14	East Midlands	Penrith & By Pa	10:30	9	Arriva Trains
10:30	8	Arriva Trains	Peterborough	10:40	13	East Midlands
10:15	6	Virgin Trains	Planley	10:17	11	Northern
10:17	11	Northern	Port Talbot Pa	10:30	14	Northern
10:30	8	Arriva Trains	Positron Le Fgl	10:40	14	Northern
10:27	5	CrossCountry	Papton	10:46	14	Northern
10:35	7	Virgin Trains	Preston	10:46	14	Northern
10:46	10	Northern	Preston Lancs	10:15 10:16	14	Transpennine
10:11	13	Transpennine	Preston Lancs	10:46	14	Northern
10:07 10:09	14	Transpennine	Reading	10:27	14	Northern
10:22	10	Northern	Reddish North	10:14	14	Northern
10:37	14	East Midlands	Romley	10:14	14	Northern
10:14	5	CrossCountry	Rose Hill Inter	10:24	14	Northern
10:24	14	East Midlands	Ryde	10:14	14	Northern
10:14	5	CrossCountry	Salford Cresce	10:22	14	Northern
10:14	5	CrossCountry	Sarnish	10:46	14	Northern
10:30	8	Arriva Trains	Scarborough	10:11	14	Northern
10:15	10	Northern	Scunthorpe	10:20	14	Northern
10:17	11	Northern	Seamer	10:11	14	Northern
			SeBj	10:41	14	Northern
			Sheff Meadows	10:20	4	Northern
			Sheffield	10:20	4	Northern
			Stoke	10:40	17	Northern
			Stoke	10:49	17	Northern

