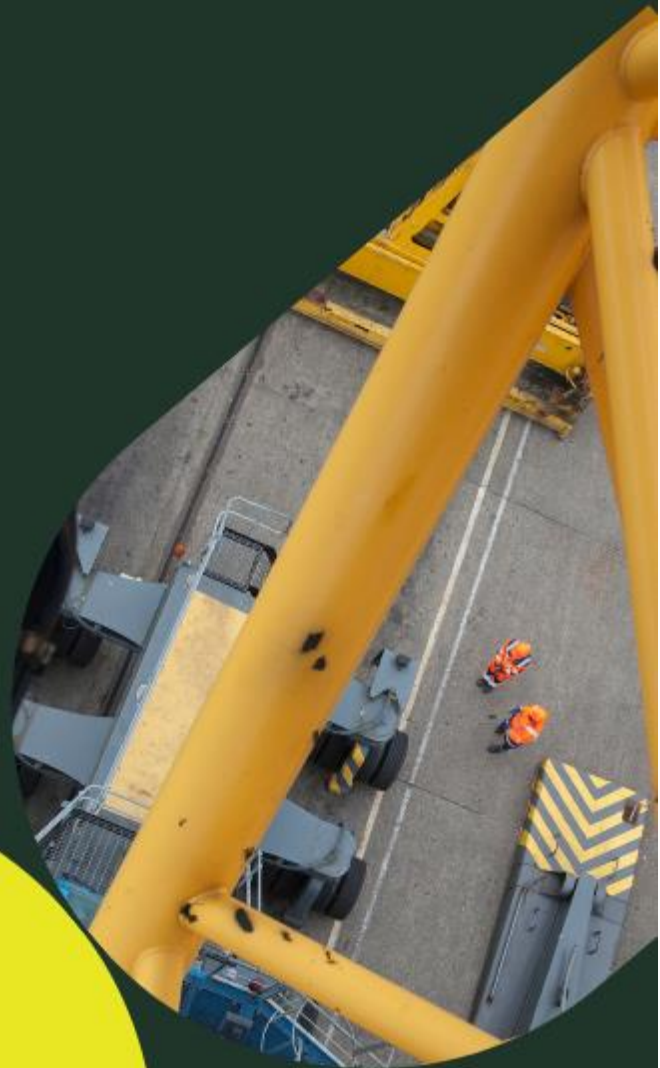


Draft Freight and Logistics

Consultation version



December 2021

 **TRANSPORT FOR THE
NORTH**

Executive Summary

The freight and logistics sector represents a key part of the North's economy, both today and in the future. By 2050 it could be worth over £30bn and employ more than 500,000 people, providing the backbone for economic growth across a range of sectors.

The sector represents a huge opportunity for the North given that over 33% of goods enter through the Northern ports and 25% of GB freight starts in the North and the same proportion of journeys end in the North.

We need an efficient multi-modal freight network that is integrated across all modes, is key to delivering our objectives and meeting the needs of industry, the economy, other transport users and the environment. Delivered holistically, this will allow the economy of the North to be more productive, efficient and sustainable while at the same time improving the environment, health and wellbeing.

The aim of this strategy is to undertake an overarching analysis of freight requirements across both road, rail, port and inland waterways in the TfN region, identify key constraints or challenges on the existing networks, and provide a list of possible areas of work including developing business cases for interventions and policy solutions that will best support economic growth and decarbonisation.

The strategy also sets out the key objectives for consideration within the context of TfN's activity and role and articulates key policy positions in terms of Freight and Logistics in our Strategic Transport Plan.

TfN will work with partners, government, delivery bodies and the industry to deliver the following objectives:

- Reduce the number of incidences of unplanned closures of Major Road Network routes leading to severe journey delay. Prioritise measures that tackle journey reliability and congestion, and support less polluting and more energy efficient movement of goods on the transport Network.
- Maximise the utilisation of rail, inland waterways and local distribution hubs to improve efficiency and support the modal shift of goods from road to rail; Improve the multi-modal North-South and East-West connectivity across the North; and optimise efficient flow of goods on the MRN and railway through improved flow of traffic and supported by technology.

- Maximise the economic development opportunities through a range of areas, including the clean growth opportunity flowing out of freeports, clean industrial clusters and the first mile freight that flows out of ports; support the planning and development of well-connected warehousing and consolidation sites, as well as exploring the benefits of regional freight consolidation and distribution networks.

Decarbonisation of the freight network is a fundamental part of our strategy, building on the TfN Decarbonisation Strategy. We need to reduce the impact of air pollution and noise from freight movements on the health of local communities; and increase electrification of the rail network and decarbonise road haulage through increased usage of zero carbon and low emission fuels.

Freight by road accounts for 90% of all tonnage moved in the North including first and last mile deliveries. Continuing to improve the network and decarbonise the road haulage fleet is vital in the short to medium term recognising that the electrification of the rail network will take until 2040 at the earliest.

This strategy provides the underpinning rationale for key road and rail investments included in the TfN Strategic Transport Plan and supporting investment programme. These include port related gauge enhancements and access for the Port of Hull, Immingham, Port Salford, Liverpool and Teesport. Also reference to warehousing development sites such as Parkside. Additionally, there is reference to WCML enhancements and the need for a gauge cleared route along the East West axis across the North.

The highways improvement schemes within the TfN STP are needed to enhance strategic connections across the North, and to improve the capacity, connectivity, resilience and access to major conurbations, economic centres and industry and logistics clusters, international gateways and intermodal terminals across the region to support economic growth and competitiveness of the northern region. These include A1 and M6 connectivity and dualling schemes, port access work both locally to the ports and wider connecting infrastructure such as the A66 and A1079 and river crossings, access to airports such as Carlisle Lake District and Liverpool John Lennon, M62 improvements which currently connect warehouse clusters and improvements that connect the North to other areas such as the A15 into Lincolnshire and the A19.

TfN will work with government, delivery bodies and the industry to ensure that these schemes and programmes are taken forward as part of the Northern Investment Programme, expanding the use TfN's policy and analytical capability in support of this important agenda.

TfN Freight and Logistics Strategy – Draft Consultation Version

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1 Foreword

Global pandemics. Nothing focuses the minds of people more than an emergency. And where does all the loo roll come from.

Strangely, from an outsider's perspective, the unexpected hero of the Covid 19 response was the Freight and Logistics industry. Moving food, medicines, making deliveries, ferrying vaccines and generally enabling lives to be preserved, the Cinderella of the transport world definitely arrived at the ball.

Set against this and other recent economic events now is the ideal time for Transport for the North to set out our stall on Freight and Logistics. How we support the ongoing delivery of our Strategic Transport Plan¹ is critical. Our Board have held the industry in high regard throughout the development of the organisation. Having a single document to detail the sector and our focused activity will help industry and government understand the value that we are adding. We have road, rail, inland waterway, air and coastal assets that all drive economic growth.

The importance of having the right networks that are resilient and accessible to both people and freight is paramount. The impetus to decarbonise has never been so high. The drive to reduce the carbon impacts of freight and logistics runs through this strategy and works hand in glove with the TfN Decarbonisation Strategy.

We call for a strong, resilient electrified rail network and certainty on fuelling infrastructure including hydrogen and battery options on the road network to support the move to greener transport.

We set out the following consultation version of this strategy for the people and businesses of the North to understand where we are as an area and review our set of recommendations that we propose to work to. The industry has never been more important globally and we need to cement the North's role in the sector growth.

Challenge us to push the boundaries and we will work with partners and businesses within the North to underpin change and deliver increased prosperity. Levelling up is crucial to the success of the UK, now more than ever.

¹ <https://transportfornorth.com/reports/strategic-transport-plan-2019/> Accessed June 2021

2 About the TfN Freight and Logistics Strategy

This is the first pan Northern Freight and Logistics Strategy. It builds on the outputs of our Strategic Transport Plan in developing a multimodal freight strategy for the North of England that can meet the current and future requirements of the North.

The future of the North is rapidly changing. There are widespread demographic changes in population, employment and economic prosperity. Together with the impacts of Brexit, Covid, technological change, future distribution of housing and jobs, changes in our shopping habits and policies on decarbonisation, will all have a profound impact on the future shape and requirements of the freight and logistics industries.

While these impacts present some uncertainty about future requirements, they also present an opportunity to re-shape the economy of the North to be more productive, efficient and sustainable while at the same time improving the environment, health and wellbeing. Delivering an efficient multi-modal freight network, that is integrated across all modes, is key to delivering these objectives and meeting the needs of industry, the economy, other transport users and the environment.

In planning such a network it is clear that interventions on the rail network cannot be considered in isolation of the highway network or vice versa. Rail freight is often dependent on road for distribution from rail heads, while removing freight from the strategic road network has widespread benefits for all users.

Building on studies and analysis undertaken by ourselves and bodies such as DfT, Network Rail, and National Highways, the aim of this Strategy is to undertake an overarching analysis of freight requirements across both road, rail, port and inland waterways in the TfN region, identify key constraints or challenges on the existing networks, and provide a list of possible areas of work including developing business cases for interventions and policy solutions that will best support economic growth and decarbonisation. The strategy also sets out the key objectives for consideration within the context of TfN's activity and role and articulates our policy positions in terms of Freight and Logistics.

This strategy covers road, rail and waterborne freight linking to port and warehousing opportunities. It is based on an examination of existing policy documents, an extensive survey of existing evidence, workshops held with areas of industry, detailed rail capacity modelling and further analysis. This is particularly relevant where the modelling cannot address the issues raised in existing evidence.

The three main issues for road and rail are similar: network capacity and capability, terminal availability and decarbonisation. However, they require different policy and investment responses.

While most of the responsibility for policy implementation lies with national and local government, TfN operates at a geographical and institutional level that allows us to facilitate a regional approach to assessing measures and research.

TfN is also uniquely placed to assist our partners in the development of business cases using our advanced data and modelling analysis skill set. We have already shared modelling tools with other sub national transport bodies. This is possible because once the way of working something out is set out in code, it is easy to swap the data sources in and out to apply the code to different areas. This is the way we can help our partners to obtain enhanced evidence, data platforms and intelligence to inform bespoke local and regional strategies in future. This can in turn support national policies to take account of spatial and social variation.

3 Why a strategy now?

The North is a place of economic opportunity, renowned for its natural beauty, heritage, culture and innovation. Transport for the North's ground-breaking piece of economic research the 'Northern Powerhouse Independent Economic Review²' published in 2016 identified Freight and Logistics as a key enabling sector to underpin the growth of the North's economy. The freight and logistics sector is a key part of the North's economy, both today and in the future. By 2050 it could be worth over £30bn and employ more than 500,000 people.

The North has particular strengths in freight, logistics and warehousing. Reflecting its unique geography, the North is well served by seaports. Immingham – with bulk handling, Roll-On Roll-Off and Lift-On Lift-Off capability – is the largest seaport in the UK by tonnage. The North of England also accounts for a substantial proportion of British freight transport, in particular rail, with 56% of total rail freight lifted to, from or within the region.

Combined, the North's logistics assets have the potential to provide increasingly important capacity for the UK, especially in the context of growing levels of trade entering the UK via ports.

² <https://www.transportfornorth.com/wp-content/uploads/Northern-Powerhouse-Independent-Economic-Review-Executive-Summary.pdf> Accessed June 2021

Future investment in the North's transport network must be considered within the context of the UK's productivity challenge, the long-term opportunities for a more inclusive and balanced UK and Northern economy, and critically the need for rapid and concerted action on reducing transport carbon emissions.

Decarbonisation has become a global priority. As science and political will converged, greater importance of reducing carbon emissions has been placed on all areas of society, not just the freight and logistics sector. When the STP was published decarbonisation had emerged as a key area of activity. Now TfN has grown and developed as an organisation, and with significant Member support, decarbonisation is now a key strategic priority and the TfN Decarbonisation Strategy³ and Freight and Logistics Strategy have been developed together to ensure consistency.

There remains a role for Government to be clear on the ways in which the transport sector achieves decarbonisation. We need to capitalise on a rolling programme of electrification, the innovative work on hydrogen fuelling in the North East, the growth in offshore wind on the East and West Coasts.

Freight was considered as an integral part of the Strategic Transport Plan published in February 2019. It was informed by evidence from industry and the TfN 'Enhanced Freight and Logistics Analysis'⁴. Following progress made on developing the business case for Northern Powerhouse Rail⁵, work on the Strategic Development Corridors⁶ and the TfN Investment Programme⁷, the next step is to produce a Freight Strategy that will enable Board to agree strategic freight priorities for TfN and then be clear with industry and partners on how to take freight projects and programmes forward. The recent publication of the Government's Integrated Rail Plan⁸ demonstrates the volatile nature of making decisions in infrastructure investment. In terms of the Freight and Logistics sector, their needs will not diminish even if passenger behaviour changes. Therefore, the need for planning interventions to maximise the use of the networks and investments required in future to accommodate growth needs to be carefully planned and considered. This strategy sets out how TfN can articulate that need for the North of England and work with funders on delivering the investments needed.

³ <https://transportforthenorth.com/decarbonisation/> Accessed June 2021

⁴ <https://transportforthenorth.com/wp-content/uploads/Freight-and-Logistics-Enhanced-Analysis-Report.pdf>
Accessed June 2021

⁵ <https://transportforthenorth.com/northern-powerhouse-rail/> Accessed June 2021

⁶ <https://transportforthenorth.com/strategic-development-corridors/> Accessed June 2021

⁷ <https://transportforthenorth.com/investment-programme/> Accessed June 2021

⁸ <https://www.gov.uk/government/publications/integrated-rail-plan-for-the-north-and-the-midlands> accessed
November 2021

This freight and logistics strategy has a multimodal focus which means it considers road, rail, maritime and inland waterways networks. The nature and profile of the activity at TfN has meant that rail does take up a large proportion of this freight and logistics strategy. This is because work on the Northern Powerhouse Rail business case, the Rail North Partnership and Strategic Rail at TfN is significant. Additionally, the rail freight operators have a well-established set of rights to access the rail network. This means that there has to be a significant understanding of freight on the railway and how programmes of investment impact on this and how we build and sustain the relationships needed to secure the success of the programmes we are championing in the North. The main rail benefit comes from the opportunity that modal shift from road to rail presents in terms of decarbonisation.

Fully integrating the recommendations of the Williams Shapps Plan for Rail⁹ published in May 2021 is key to securing the modal mix we are striving for. The value of freight services and the access they have to the rail network has been clearly identified.

Great British Railways will have statutory duty to promote rail freight and sets out how the government will work with the market to secure investments in the network. In turn, this will offer certainty to the freight market so that investments in engines and rolling stock can be planned at the right place at the right time. The example of securing investment at Ely will enable North to gain benefits too, so our approach to rail investment will always need to be seen in a national context. This is an example where both TfN and Transport for the South East have both recognised the need for investment and have supported this through the Strategic Freight Network Steering Group on behalf of the Sub National Transport Bodies.

We will work with GBR and Government when it sets a growth target for rail freight and embeds freight firmly into strategic decision making. This is a huge step forward but does not diminish our aspirations for sustainable decarbonised road freight growth.

Freight by road accounts for 90% of all tonnage moved in the North including first and last mile deliveries. Continuing to improve the network and decarbonise the fleet is vital in the short – medium term as we recognise that mass electrification of rail won't happen until 2040 at the earliest. There will be an urgent need for the Freight and Logistics industry to liaise closely with both local and regional planners to plan network changes that will accommodate the shift to decarbonised streets. This has happened successfully in cities such as Rotterdam and

⁹ [Great British Railways: Williams-Shapps plan for rail - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/94421/gbr-williams-shapps-plan-for-rail.pdf) Accessed June 2021

Amsterdam. Consistent education over more than 30 years and planned changes to road layouts over time have enabled greater and safer cycle usage and integration in the cities.

In summary, the strategy consists of the following sections:

- Our networks;
- Our objectives;
- Road and Rail considerations;
- Future role of TfN analysis; and
- Delivery of the Strategy and Recommendations.

3.1 Key objectives

The key objective of the Freight and Logistics Strategy is to accelerate our Investment Programme interventions that would best support the strengthening of the North's economy. Additionally, to set out how we can accelerate the move to zero carbon that is within TfN's gift. We have already published our Decarbonisation Strategy which sets out the trajectory towards zero carbon.

Additionally, to identify the policy positions TfN needs to develop to deliver the strategy effectively which will inform the review and revision of the Strategic Transport Plan and Investment Programme published in 2019.

Set in the context of the Northern Transport Charter ambitions of Championing and Inclusive and Sustainable North, securing a Long-term Northern Funding Settlement, putting the North's rail passengers first and leading Strategic Transport delivery this strategy will move the debate forward on supporting the ambitions that will enhance the North's economic strength and ambition.

3.2 Freeports

The 2021 Budget announced the locations of eight freeports in England. The Freeports of Humber, Liverpool City Region and Teesside are in the TfN area. The benefits of the other freeport arrangements further south will be felt within the North as the other freeport areas play a significant role in the economy of the North by trade activity.

Where the ports of the North have not been awarded freeport status, we will continue to champion the infrastructure needs and any development opportunities that sits within TfN's remit to do. The Government's

approach to Freeports is that they generate opportunity for economic growth. We do not want to see the decline of other port activity if companies are indeed swayed to move to such a port by the tax and other economic benefits freeports offer. This is an issue we will watch with great interest.

We also note that at the time of consultation Freeports at TeesPort, Humber and in London are progressing and are indeed launched. This is an exciting development and as they develop further we will build relationships with the teams operating them and ensure we continue to capture their wider infrastructure needs in our work.

3.3 Importance of the freight and logistics sector in the North

In 2016 Transport for the North published the ground-breaking Northern Powerhouse Economic Review. The review identified that the GVA in the North was 25% below the national average which is a significant gap in productivity. This meant that there was an opportunity to articulate the need for investment in the North in a different way – to maximise the productivity of the whole of the UK which would contribute a stronger economic offer for UK PLC.

The prime economic sectors of advanced manufacturing, health innovation, energy and digital were identified as key to the North's success. To support these sectors, Freight and Logistics was identified as an enabling sector alongside finance and professional services and education. This identification of freight as a key enabler was the catalyst for the work on freight and logistics at TfN and the networks and investment needed in the North to close the productivity gap.

The review also identified that it was not the lack of diversity of sector activity in the North but that the difference in productivity within each sector that matters more. There was also a lack of business to business sharing and development of expertise. Whilst this is not fixed easily, as relationships develop across TfN programmes we ourselves can be a catalyst to help change this position.

The freight and logistics sector activity in the North is significant. With high levels of major port and warehousing activity and the clear desire articulated by Members to see the networks strengthened to support the growth of these areas, TfN invested heavily in understanding the pan Northern impact of the sector. This gave freight and logistics prominence in strategy development and the publication of the Enhanced Freight and

Logistics Analysis supported the development of the Strategic Transport Plan.

Northern Powerhouse Independent Economic Review

The 2016 Northern Powerhouse Independent Economic Review (NPIER) identified freight as one of the North's key enabling capabilities, playing a vital role in delivering transformational economic growth across the region. This transformational growth will deliver an additional £100 billion in GVA and an extra 850,000 jobs in the North by 2050.

The past experience in the logistics sector has been growth at a slightly faster rate than in the wider economy. The sectoral composition of the North in a transformational growth scenario implies trends that both reduce and boost the demand for logistics: lesser importance on heavy freight imports and exports (and for the future a greater reliance on more sustainable modes, notably rail and water-borne) and supply chain imports associated with those sectors; greater importance of imports of consumer goods and high-value (including air) freight.

Under the transformational scenario, the net effect of these changes are assumed to keep the logistics sector's growth above that of the Northern economy, whilst productivity growth within logistics in the North is assumed to be at a similar or slightly faster rate than in the UK economy as a whole.

Following on from the publication of STP and Investment Programme in 2019, freight requirements have been a key consideration within TfN's Strategic Development Corridors and subsequent work on the Investment Programme Benefits Analysis.

Given its high profile nature and the additional importance of decarbonisation and how the themes interact, it is timely to see this strategy published and ensure the sector itself, Northern Leaders and Government clearly understands and appreciates the Northern priorities we identify and wish to see delivered.

In April 2019, the National Infrastructure Commission published evidence drawn together by Vivid Economics on the Value of Freight¹⁰. They reported that 'the cost of the UK freight system is equivalent to around 4% of GDP. We estimate that the UK spends up to £80 billion per year on road freight, rail freight and warehousing. Of this, road freight accounts

¹⁰ <https://nic.org.uk/studies-reports/uk-freight/the-value-of-freight/> Accessed June 2021

for around £38 billion; rail freight for around £1 billion; and warehousing for £20-38 billion. Labour costs make up around one third of road freight and warehousing costs.'

The sector represents a huge opportunity for the North given that over 33% of goods enter through the Northern ports and 25% of GB freight starts in the North and the same proportion of journeys end in the North. However, there is some evidence that constraints in the freight network, nationally, cause inefficiencies. These include a shortage of warehouse capacity (especially rail connected warehousing), the inability of rail to carry containers east-west across the Pennines or elsewhere in the North and the disproportionate reliance on the ports in the South (even when roll on roll off traffic is excluded). This is because the North's rail network cannot fit the containers on it as the tunnels and bridges are not big enough in places. This is known as 'gauge clearance' and the North would like to see the largest gauge, W12 being delivered on the network where possible.

By taking a multimodal approach, and using demand information generated by the modelling and analysis tools developed at TfN, we can consider capacity constraints on the whole network. In terms of road and rail there will be consideration of the importance of well-connected terminals that feed the warehousing clusters of, for example, Warrington in the North West and Wakefield and Doncaster in the East all of which are constantly evolving and securing new business.

3.4 TfN Future Travel Scenarios Background

TfN's Future Travel Scenarios (published December 2020)¹¹ apply a comprehensive consideration of the economic, environmental, social, spatial and technological future uncertainties which will influence how people, businesses and goods interact with the transport network in the future.

The Future Travel Scenarios highlights various factors that are external to TfN's direct control, acting as 'reference cases' with which we can test the performance of TfN strategies and policies in pursuing our vision and objectives across different scenarios. The factors explored during this work are categorised as:

1. Growth in the population and economy;
2. Spatial planning policy and economic distribution;
3. National policy on environment and sustainability;
4. Technological change and advancement; and

¹¹ <https://transportfornorth.com/future-travel-scenarios/>

5. Social and behavioural change.

Our approach opens up these factors and their complex interactions with travel demand and land-use, with the aim of inserting them into the heart of our long-term planning and decision making. This enhanced understanding provides a mechanism which with to ensure we are robust, resilient and agile to wide-ranging and cross-sector uncertainties, and we can approach future uncertainty with confidence.

The Future Travel Scenarios were developed in partnership with Local Authority partners, national delivery partners and academic experts and informed by local strategies and priorities.

Our Future Travel Scenarios will form an integral part of TfN's decision-making processes. In conjunction with our Analytical Framework and Appraisal Framework, they will be used to test and refine TfN transport strategies, policies and programmes so that we support transport interventions, solutions and policy measures that meet our objectives across a range of futures.

Our four TfN future travel scenarios are summarised below:

Just About Managing - What if society continues to develop in line with existing trends?

- This scenario sees a state of inertia, although this should not be taken as neutral. It sees a future where people do not alter their behaviours much from today, or give up certain luxuries, although there is a gradual continued trend towards virtual interaction. Economic growth continues at a moderate rate, but it is largely consumption-led and unequal, lacking agility and vulnerable to shocks. This scenario is led by markets, without much increase in political direction, with its biggest driver being economic.

Digitally Distributed - What if society achieves our transformational growth outcomes by using technological solutions to create connection and agglomeration across towns and cities?

- This scenario sees a future where digital and technological advances accelerate, transforming how we work, travel and live. In general, we embrace these technological changes and the move towards a distributed, service-based transport system. Long-term climate change targets are met, but there is slow progress in the short-term due to a general preference for individualised mobility over traditional public transport. This scenario is led by technology, with

the biggest drivers being technical advances and a willingness to embrace mobility-as-a-service and shared mobility in the long-term.

Prioritised Places - What if society becomes more focused on place, place-making and community than growth or connectivity?

- This scenario sees a significant shift in political and economic direction to ensure that no place is left behind. Every area, including cities, towns and rural and coastal areas, has a bespoke local economic strategy, supported by investment in local assets, specialisms and economic and social infrastructure. Community, localism and place-making across the North is applied to build a sense of local identity to improve local economies. There is a focus on work-life balance and social equity within and between places. This scenario is led by a change in priorities, with its biggest driver being the push for a fairer redistribution of economic prosperity.

Urban Zero Carbon - What if society achieves transformational growth outcomes by using policy intervention to maximise energy-efficient city growth?

- This scenario sees a significant shift in public attitudes towards action on climate change, and strong national Government response to meet it. There is a boost to economic productivity to levels consistent with the NPIER, primarily through a combination of urban agglomeration and place-making. Transport users demand and embrace publicly available transit and active travel options, as there is a blurring of the line between 'public' and 'private' with increasing shared mobility systems online. This scenario is led by attitudes to climate action and urban place-making, with the biggest drivers being strong Government policy and trends of urban densification.

TfN's Future Travel Scenarios Report¹² provides a comprehensive overview of the process undertaken to develop the new Future Travel Scenarios. It also delves into the contextual factors underlying each scenario, resulting stats and figures, and explores the expected implications of each future state.

¹² [TfN Future Scenarios Report FULL FINAL V2.pdf \(transportforthenorth.com\)](#) Accessed June 2021

4 The North's Freight and Logistics network

The North of England's transport network is extensive and encompasses rail, road, inland waterways, sea and air infrastructure in addition to a significant volume of warehousing, particularly around Liverpool, Manchester and Leeds.

The transport infrastructure supports a Northern population of over 15.5 million people¹³, and prior to the impact of Covid-19 7.4 million jobs¹⁴, covering over 38,000 square kilometres of land¹⁵. The North of England contributes over £364 billion GVA towards the UK economy¹⁶.

Freight accounts for 9% of the country's GDP and supports every industry with access to goods and services. In the UK, a total of c1.65 billion tonnes of freight are lifted by all modes per annum. Over a third of freight tonnes lifted comes from the Northern Ports covering both international and domestic traffic.

The North boasts a wealth of freight assets that grant the North a strong multimodal freight capability. These include:

- Eleven major ports (three with provisional Freeport status) in addition to other smaller ports located on the Tyne, Tees, Humber and Mersey as well as in Lancashire, Cumbria and Northumberland;
- Seven international airports including Liverpool John Lennon, Leeds-Bradford, Doncaster-Sheffield, Humberside, Durham Tees Valley and Newcastle in addition to the major international airport at Manchester;
- Three Strategic Rail Freight Interchanges (SRFIs – distribution centres with intermodal terminals) at Ditton, Wakefield and Selby with more emerging;
- Five further Intermodal Terminals at Trafford Park, Leeds, Garston, Doncaster and Widnes;
- A Strategic Road Network focused on the M62/M60/M56 and A66/69 East-West corridors and the M6 and M1/A1 North-South corridors;
- A strategic rail network principally comprising of the West Coast Main Line, East Coast Main Line and Midland Main Lines that connect the North of England to the South and the Transpennine routes; and

¹³ Office for National Statistics (2021), 'Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland: Mid-2020: 2021 local authority boundaries'. [Accessible [here](#)]

¹⁴ Labour Force Survey (Jan-Mar 2020), May 2021, ONS [Accessible [here](#)]. The most recent data (Jan-Mar 2021) indicates that employment across the North is around 7.2 million.

¹⁵ Office for National Statistics (2021), 'Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland: Mid-2020: 2021 local authority boundaries'. [Accessible [here](#)]

¹⁶ Office for National Statistics (2021), 'Regional Gross Value Added (balanced) by industry: all ITL regions' [Accessible [here](#)]

- A significant amount of distribution centre capacity.

Despite these assets being available, many are not being fully utilised due to a number of reasons such as lack of joined up infrastructure or attractive alternative logistics solutions. Gaps in connectivity prevail that urgently require investment; 80% of road freight in the North is domestic traffic, most of which is short haul (making it difficult to justify the use of rail on commercial or efficiency grounds), which places a heavy burden on the strategic road network.

4.1 The North's Road Freight Network

The Strategic Road Network (SRN) in the North of England covers many of the region's large economic centres. North-South routes are provided through the M6 between Carlisle and Rugby, providing a vital link through the west of the region, and the A1 (M) between Newcastle close to Doncaster through the east of the region. The M1 links Leeds to London and provides a key route into and out of the North.

East-West routes are provided primarily through the M62 as the central corridor between Liverpool in the west and close to Hull in the east.

Additional routes include:

- M56 between Manchester and the Welsh Border near Chester
- M58 between the M6 at Wigan to the north of Liverpool close to the Port;
- M57 links the M58 and M62 and provides an eastern bypass to Liverpool;
- M53 links Liverpool to the M56 via the Wirral;
- M60 forming the Manchester Ring Road;
- M65 between Preston and Colne;
- M18 links the M1 near Rotherham to the M62 to the west of Goole;
- M180 connects the M18 north of Doncaster to the A180 west of Grimsby and Immingham;
- A628/A616 is the main strategic freight route between South Yorkshire and Greater Manchester;
- A69 links Carlisle and Newcastle; and
- A66 provides a strategic route between Penrith (M6) to Scotch Corner on the A1 (M).

4.2 The North's Major Road Network



Whilst total traffic volumes are greatest on roads operated and managed by National Highways, known as the Strategic Road Network (SRN), this only accounts for 2% of the road network in the North. Almost all road journeys start and finish on local roads, including those first and last miles of a journey that can make all the difference as to whether goods or people make it in time and as efficiently as possible.

In response to this issue, TfN and its constituent Authority Partners have identified and mapped a Major Road Network for the North - a network consisting of the North's economically important roads. This network, which includes both the SRN and important local roads, represents about 7% (by distance) of the roads in the North, and links the North's important centres of economic activity, including the first and last miles to and from the SRN.

The North's important centres of economic activity include:

- Ports and airports, supporting imports, exports and the visitor economy.
- Clusters of the prime and enabling capabilities as defined in the Northern Powerhouse Independent Economic Review.
- Major population centres, which are generally over 50,000 residents.
- Enterprise zones, universities and other key employment sites.
- Major centres of tourism.

There is a direct link between better connectivity to these assets and enabling the North's economy to realise its potential.

The MRN¹⁷ has a critical role in connecting people, businesses and communities, and, put simply, major roads are indispensable to supporting economic activity, access to services and our overall quality of life.

4.3 Road issues

The key considerations for the network include capacity to fit all the forecast growth on the network and any constraints this then highlights. The reliability and resilience of the network is also challenging with the ability to recover from planned and unplanned events critical to the economic success of the North as a whole.

Key areas of the highway network where constraints are forecast to impact road freight include the East West Trans-Pennine movement on the M62, A66 from Tees Valley to Penrith – particularly vulnerable to weather conditions and the subject of a major programme of investment led by National Highways. North-South connections on the M1 around Sheffield, A1 West of Doncaster, A1 Newcastle - Gateshead Western Bypass, the M6 in Cheshire and Warrington and the A19 in the Tees Valley and North East. The particular pinch point occurs at the Tees crossing which requires investment and has a clearly articulated and well understood Business Case.

Other areas of investment with significant freight benefits include access to 'constrained' ports for example the A5036 to the Port of Liverpool and A63 to the Port of Hull, both schemes within the Highway England RIS2

¹⁷ It is important to note that the MRN defined by TfN and our partners differs from the Department for Transport's definition of the MRN, which is defined as being separate to the Strategic Road Network (SRN) and encompasses around 2% of roads in the North.

Programme; road and rail access to Parkside in St Helens and schemes being considered within the RIS3 Pipeline, for example A1 Doncaster – Darrington and M1/M62 Lofthouse interchange. In terms of freight connectivity, the access to and from Intermodal Terminals for example at Trafford Park, Leeds, Garston, Doncaster iPort Rail and Widnes and International Airports particularly Manchester and Newcastle also requires attention. Most of these areas are particular examples where a pan-Northern view on the investments needed are helpful in developing business cases for investment.

Linked to the topic of decarbonisation are the concerns around air quality in major urban centres. Clean Air Zones (CAZ) with targeted actions to improve air quality and reduce significant levels of air pollution have been proposed in Greater Manchester, Leeds, Bradford, Newcastle and Sheffield. There is a push to consider different ways of making deliveries in urban areas using e cargo bikes and zero emission vehicles as an example. This can be difficult as the road infrastructure needs to meet the needs of all vehicles. Where cities across Europe have embraced the benefits of more localised deliveries, it is built upon decades of policy change and spatial planning policy development that delivers infrastructure to maximise the benefits to the zero carbon road user rather than the petrol or diesel vehicle. It is also worth clarifying that there will always be a role for lorries and rail services to bring goods into city centres to restock shops and other establishments. One lorry can carry the equivalent of 20 van loads so bigger lorries can indeed be better in some circumstances.

Road will remain the main modal choice for freight due to the existing popularity of the network, ease of access, lack of rail capacity and the long timescales and high costs associated with creating new rail capacity. Having said this, we would expect that after 2040 a greater percentage share of freight will be carried by our rail network. Reflecting this, TfN's Decarbonisation Strategy has targeted rail traction decarbonisation in the North by 2040 (in line with Network Rail's Traction Network Decarbonisation Strategy).

Our Decarbonisation target of near zero emissions by 2045 means that the road fleet needs to be decarbonised by then too. The route to decarbonising our road freight vehicles is still unsure, although is likely to be a mix of hydrogen and battery electric solutions. TfN's Decarbonisation Strategy has laid out a number of recommendations to expedite the decarbonisation of our road freight, including the testing and trialling of new vehicle and refuelling technologies in the North, data democratisation (i.e. making fuel/driving efficiency data available to all) and the

aggregation of zero emission vehicle orders to prove a market for vehicle manufacturers in the North.

4.4 The North's Rail Freight Network

The North of England has an extensive rail network ranging from faster main lines to rural branch lines and freight-only lines into and out of ports for example.

The main north-south rail routes include:

- West Coast Main Line (WCML) from Scotland / Liverpool and Manchester to London Euston through the North of England via Crewe;
- East Coast Main Line (ECML) from Scotland / Newcastle / Leeds / Middlesbrough / Hull / York / Darlington to London Kings Cross through the North of England via Doncaster; and
- Midland Main Line (MML) from Sheffield to London St Pancras.

There are also a number of other routes throughout the North of England which are used for the movement of freight. There are others which have the capability but lack capacity or space needed to fit additional trains on. The current routes used include:

- Diggle Route from Manchester to Leeds via Stalybridge and Huddersfield;
- Calder Valley Route from Manchester to Leeds via Rochdale, Halifax and Bradford;
- Hope Valley Route from Manchester to Sheffield via Marple and Chinley
- Leeds to Carnforth via Wennington;
- Leeds to Carlisle via Settle and Appleby;
- Blackburn, Hellifield, to Carlisle via Settle and Appleby;
- Chat Moss Route from Liverpool to Manchester via St Helens and Newton-le-Willows;
- CLC route from Liverpool to Manchester via Warrington;
- Cumbrian Coast Line from Carlisle to Barrow-In-Furness and Lancaster via Workington and Whitehaven;
- Durham Coast Line from Newcastle to Middlesbrough via Sunderland and Hartlepool;
- Tees Valley Line from Saltburn via Darlington to Middlesbrough and Redcar; and
- Cleethorpes line from Cleethorpes to the Doncaster via Grimsby, Immingham and Scunthorpe.

4.5 Rail issues

Network capacity is the key issue for rail. It is a challenge in terms of the capacity of the network to accommodate either more trains reliably or flexibility around where the trains travel to or from and in terms of gauge which drives the ability to handle intermodal traffic both on the existing network and for new journeys. Robust timetables are also needed for freight certainty so the network works as a whole system rather than disjointed.

Evidence gathered for this report suggests that just less than half freight paths are used in total, however that is not the case on routes or at times where capacity is constrained, for example, on the Castlefield corridor in Manchester. There is little or no spare capacity over the four key freight bottlenecks identified by the network capacity modelling for this report - other than at night. These include the WCML north of Golborne, ECML two track section through Durham, Midland Mainline through Sheffield and across Manchester. The work has showed that rail freight end to end train times already suffer from significant additional time in order to be squeezed onto the network.

4.6 Manchester Taskforce

There is a particular problem in the Manchester area, where all the former main freight lines that avoided the city centre have been closed. That has left most freight trains having to go through the city centre, either through Victoria or along the Castlefield corridor through Piccadilly and Oxford Road which is the only route to the Trafford Park freight terminal. However, the whole network in central Manchester is severely congested which causes extremely high levels of delays to train services, giving Manchester 20% of the locations with the worst train delays in Britain. As a result, Network Rail has formally designated the Castlefield corridor as 'Congested Infrastructure', one of only 3 locations in Britain to have been so designated.

TfN is working with DfT and Network Rail to identify what enhancements are needed to rail infrastructure in and around Manchester to enable services to operate reliably and to cater for future growth. That work is focussed on passenger services, though freight services would also benefit from any reduction in delays on the network. In addition, TfN is working on a Network Gaps Delivery Plan to set out priorities for new or re-instated sections of line in the North, as part of which consideration is being given to possibilities in south Manchester that could enable freight trains to access Trafford Park without having to go through central Manchester.

4.7 The North's Freeports

The 2021 Budget announced the locations of eight freeports in England. The Freeports of Humber, Liverpool City Region and Teesside are in the TfN area. The benefits of the other freeport arrangements will be felt within the North as the other freeport areas play a significant role in the economy of the North by trade activity.

The eight locations are:

- East Midlands Airport;
- Felixstowe & Harwich;
- Humber;
- Liverpool City Region;
- Plymouth and South Devon;
- Solent;
- Teesside; and
- Thames.

As more clarity on the arrangements emerge TfN will support the delivery of initiatives where this sits within the remits we have agreed with Government. The current Freeport policy has three objectives set out below:

- establish Freeports as national hubs for global trade and investment across the UK;
- promote regeneration and job creation; and
- create hotbeds for innovation.

The policy areas above are reliant on good transport links to enable their delivery so we will continue to articulate the priorities set out within our STP and associated Investment Programme to aid delivery.

A range of benefits will be available to freeports in the following policy areas:

- Customs
- Tax. This includes measures on:
 - Stamp Duty Land Tax (SDLT) Relief
 - Enhanced Structures and Buildings Allowance
 - Enhanced Capital Allowances
 - Employer National Insurance Contributions Relief
 - Business rates

- Planning
- Regeneration and infrastructure: successful bidders will be able to access a share of £175 million of seed capital funding, depending on the submission of an outline business case (OBC).¹⁹
- Innovation

Now the successful freeport areas have been announced by the Government, the identified locations will draw together an Outline Business Case for the regeneration funding available in line with the Green Book. Transport for the North commits to add value and support to this process where this sits within our role.

4.8 The North's Port network

Short Sea Shipping (SSS) is the maritime transport of goods over relatively short distances on routes, such as Liverpool to Dublin and Immingham to Rotterdam, whereas Deep Sea Shipping (DSS) refers to the maritime transport of goods on intercontinental routes, crossing oceans.

The primary driver for growth in terms of shipping is intermodal container freight on both SSS and DSS routes. This is reflected in the 2050 forecast although the more predominant intermodal flows are focused on the southern ports, such as London Gateway, Southampton and Felixstowe, where extensive facilities for handling large container vessels have been created.

The Port of Liverpool has however invested over £400 million in the creation of a new deep-water container terminal that will enable two 13,500 TEU vessels to call at one time and hopes to attract regular container ship calls to boost the port's intermodal throughput.

SSS transports the larger volume of cargo into the Northern ports with imports exceeding exports. DSS tend to be focused on large vessels making one call in the UK on global loop routes. Currently some of intermodal freight brought into Europe by DSS services is fed into ports such as Rotterdam with smaller feeder vessels and SSS services transporting it as both accompanied and un-accompanied freight to the Northern ports. The intermodal freight that is transported via the southern UK ports generally travels to and from the North of England by rail into and out of intermodal terminals such as Trafford Park in Manchester for onward "last mile" distribution by road.

The Humber ports dominate the shipping volumes mainly because there are three significant ports (Hull, Immingham and Grimsby) located on the Humber Estuary. The majority of the freight handled by the Humber ports

arrives via SSS routes. There is however also significant DSS services into and out of the Humber.

The Mersey ports are evenly balanced between SSS and DSS with aspirations of future growth in DSS services via the new container berth known as "Liverpool 2". Liverpool has developed a strong network of short sea shipping routes and is a major short sea shipping hub for the Irish Sea area with ro-ro ferry services to the Isle of Man, Dublin and Belfast (key operators including Stena Line, Seatruck Ferries, P&O Ferries and Isle of Man Steam Packet) and lo-lo container feeder services to Dublin, Belfast, Cork and Glasgow and from English Channel Ports (including Southampton, Rotterdam, Antwerp and Le Havre) for example. These feeder services to the English Channel Ports connect Liverpool to deep sea container services to the Far East, India, Africa and South America. Peel Ports also operate the innovative container ship service from the Port of Liverpool along the Manchester Ship Canal.

The Tees ports handle mainly SSS services and primarily import freight with Tyne & Wear ports handling smaller mixed volumes. Lancashire ports handle only SSS services and the ports in Cumbria handle a small amount of SSS services.

Regional ports are also vitally important in supporting the local economy and providing capacity and capability for the north. Improved connectivity is also vital for their role. In Cumbria for the Port of Barrow, road improved connectivity on the A590 through to the M6 is vital and for the Port of Workington both "last mile" road connectivity from the A66 and improved capacity on Cumbria Coast Line is considered important in supporting their role.

4.9 The North's Port surface access

The landside facilities for the distribution of goods to and from the Northern Ports is imperative to increasing their attractiveness and ensuring freight is moved efficiently across the network.

Many of the Northern Ports are located in urban areas such as Liverpool within the city itself and therefore any increase in vehicle flows in particular on the local road network will have a negative impact on air quality with resulting congestion impacting on the operational cost of transport.

Many of the ports feature both road and rail access, however, often routes to join the major transport networks are slow and unreliable. Again, this reduces the competitiveness of the Northern ports.

Providing infrastructure to allow freight to be transported to and from the ports effectively is imperative. A good example of where the North falls short in this regard currently is the Biomass traffic that is brought into the UK through the Port of Liverpool for onward transport by rail to the Drax site at Selby. The route that trains take between the two points is not direct and often takes a considerable amount of time at low speeds due to capacity concerns (related to train weight and pathing constraints) on the east-west routes between Liverpool and Yorkshire. Delivery of a gauge cleared route for full sized containers by rail on standard wagons and capable of carrying longer heavier trains is what we are looking to see delivered on the TransPennine Route Upgrade on an East West basis. Delivery of the programme would save over 170 miles for a return road journey which will benefit the environment as well as the freight industry.

The Port of Hull's rail connection has recently been upgraded to W10 gauge clearance to enable the movement of containers by rail to and from the port. Immingham, Teesport and Liverpool (restricted train lengths) also have the ability to handle containers by rail.

Similarly the gauge cleared route from Immingham to the East Coast Mainline along the South Humber rail line has been delivered. This was jointly funded by the Humber LEP, North Lincolnshire Council and Network Rail – a very successful project working across many partners. ABP are working closely with their customers to attract trade activity into the area and a significant draw for companies is the ability to put containers onto the railway. The challenge is accommodating additional freight capacity onto the East Coast Mainline in a timely and sustainable manner.

4.10 Drax Case Study

At present four out of eight turbines at Drax currently burn biomass and take an average of 38 trains per week with the majority of routes coming from Immingham. This is because the route to Immingham is available and the port has good storage and train loading capacity. Liverpool developed a biomass handling facility to improve the resilience of supply should the alternative ports Drax uses flood. With the facility available at Liverpool there is a desire to load more at there and move it by rail to Drax. The routing issues and journey times mean that the wagons needed are unavailable. This is because of the length of time they would be in use for each leg of the journey.

At present, very few of these trains run via Diggle, mainly on nights, as there are no paths. They run via the longer and slower Calder Valley route through Cheshire on their trip from Liverpool. They take seven hours or so for the 100 miles total trip by road.

When turbine units 5 and 6 come on line, the demand for more biomass trains will increase too and they will be sourced from the most efficient loading and unloading port facility as well as where the freight company can source the best paths to maximise both the driver's time as well as the asset. When units 7 and 8 come on then one could expect a very significant increase on/pressure on the railway. Whilst the demand for intermodal paths grows the Rail Freight Group have suggested that the available hourly Diggle freight path could be used for Biomass in the initial absence of containers. Therefore, there is a desire to see the Diggle route being able to accommodate 2600 tonne trains hauled by two Class 66 and all able to fit on the tracks and infrastructure at the same time.

4.11 The North's Inland Waterway Network

There is a network of inland waterways within the North of England. The major waterways concerned with the movement of freight are the Manchester Ship Canal and the Aire Calder Navigation which also includes the River Humber and River Ouse.

The Manchester Ship Canal stretches from the Mersey at Liverpool up towards Salford in Manchester. Ships and barges regularly use the Manchester Ship Canal to transport goods to and from ports at Runcorn, Warrington, Irlam and Salford.

There are proposals for new and enhanced port terminals along the Manchester Ship Canal such as Port Wirral (Eastham / Ellesmere Port Docks), Port Cheshire (Bridgewater Paper Mills), Port Ince (Protos Energy Park), Port Weston, Port Runcorn, Port Warrington, Port Irlam and Port Salford.

There are challenges in terms of infrastructure on the route with key crossings being closed to vehicles as ships pass through the canal. This can often lead to localised congestion.

The Aire and Calder Navigation is accessed from the Humber Estuary and River Ouse at Goole and runs west towards Leeds. There are numerous barges in use on the canal that transfer bulk goods from the Ports on the Humber such as Immingham and Grimsby.

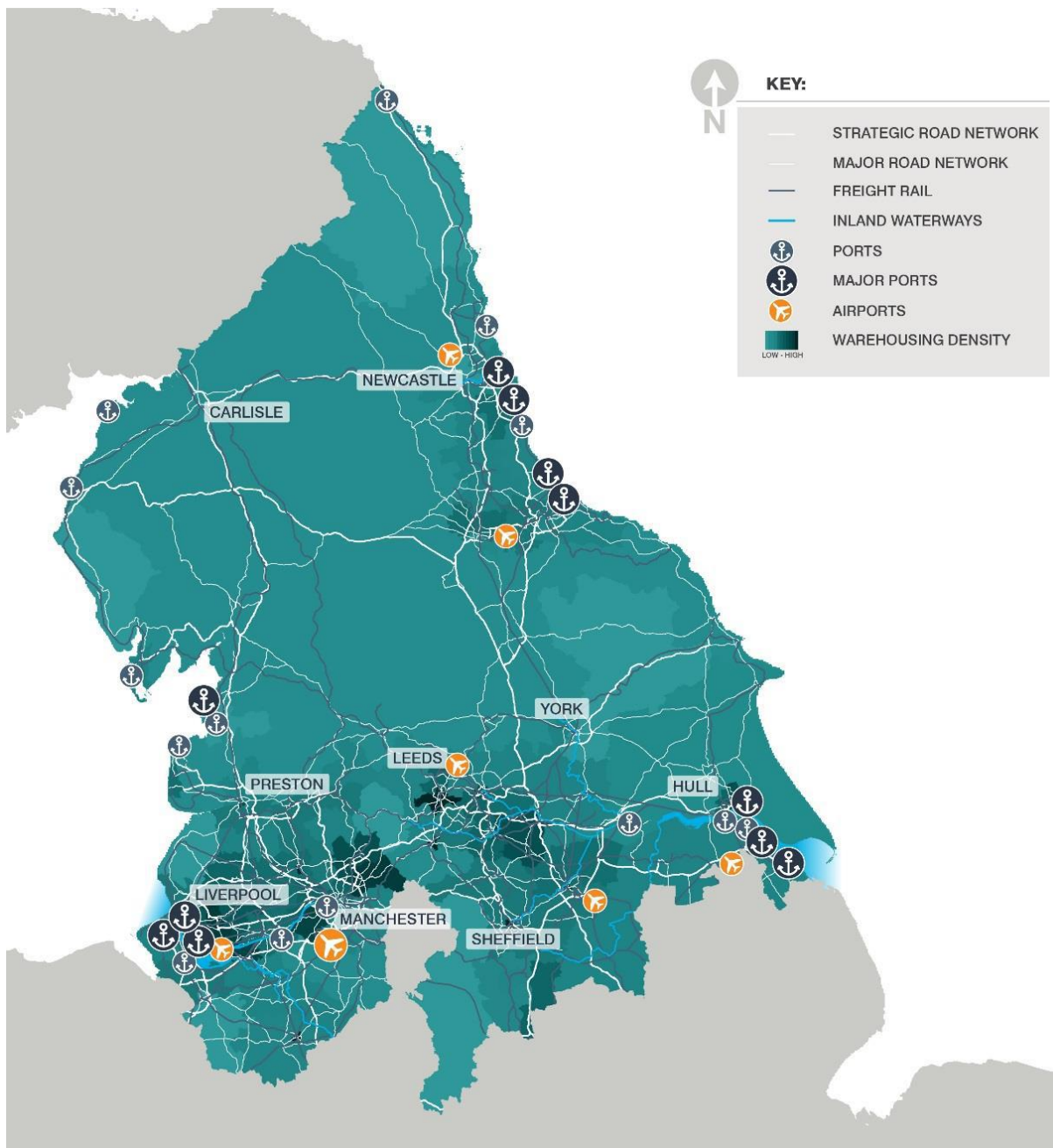
Development is underway on the Aire and Calder Navigation, focused around providing more space for the deliveries of bulk materials related to construction, however there are infrastructure constraints on the canal in terms on bridge heights for example, which limit the size of vessels that can use it. The opportunities this presents the owners and managers of the waterways are being explored. The Humber Ports and the Canals and Rivers Trust (CRT) are continuing to investigate the potential to increase

traffic on the Aire and Calder Navigation to generate more freight to and from the Humber.

4.12 The North's Multimodal Freight Flows

The North's freight traffic is carried by road, rail, maritime and air. Inland waterway and air carry very small percentages of overall volumes in the north. TfN recognises that there are opportunities as outlined above.

The key transport infrastructure in the north of England is presented in the map overleaf:



Key Transport Infrastructure - North of England

The UK handles large volumes of imports and exports at various seaports. There are three major port clusters in the North of England: Liverpool, Hull and Immingham, and Tyne and Wear. These ports generate traffic to/from inland terminals and warehouses within the North and beyond. These tend to handle short-sea traffic. In addition, large volumes of freight destined for the North comes the major deep-sea ports in southern England: Felixstowe, Southampton and London Gateway.

The other generators of freight traffic are inland distribution centres, terminals and warehouses. These are scattered across the country for onward distribution to end customers (e.g. retailers, households, or business users of commodities such as construction sites and factories). In the North, areas of high warehousing density are usually urban clusters, particularly around Manchester, Liverpool, Leeds and the wider Yorkshire region.

Main commodity groups carried by road and rail freight include:

- Intermodal Container
- Construction
- Metals
- Automotive
- Petroleum
- Foodstuffs and household delivery

Freight flows in the North of England can be divided into two main directions, north-south and east-west

Key flows	Main rail routes	Main road routes
North-South	WCML (Crewe – Carlisle)	M6
	ECML (Doncaster – Newcastle)	A1 (M) (especially York and Newcastle)
	MML (south of Sheffield)	M1 (south of Sheffield)
East-West	North Transpennine Line (via Diggle)	M62 (between Liverpool and Hull)
	Calder Valley Line (via Rochdale)	A69 (between Carlisle and Newcastle)
	Copy Pit Line (via Burnley)	A66 (between Penrith and Scotch Corner)
	Hope Valley Line (via Edale)	

All the listed north-south routes are very busy across both road and rail, carrying both traffic to/from or within the North and significant Anglo-Scottish traffic (much of which through the North). The WCML and M6 both carry very high freight volumes south of Warrington.

For east-west traffic, there is currently relatively little rail traffic. There is at present no gauge-cleared route suitable for container traffic. The small number of trains that run are for Construction Aggregates and Biomass.

The busiest east-west road corridor for freight is the M62. The A69 and A66 also play an important strategic freight role, offering strategic links to Scotland and ports. Reflective of this; they carry lower volumes of traffic overall. However HGVs and LGVs account for a large percentage of overall traffic on these routes making them a key route in the North for freight. The A616 and A628 which provides a route to Manchester known more popularly as Woodhead can be affected on multiple occasions throughout the winter. Due to the Pennines topography, these are the only main east-west routes with a lack of suitable alternatives and are susceptible to disruptions. The beast from the East in early 2018 brought extreme temperatures and heavy snowfall to the UK. At one point it was not possible to travel on an East West basis by road due to snow, accidents and closures. Although an extreme event that isn't traditionally planned for in the UK climate, it is worth noting and provides a sobering reminder of the importance of resilient and reliable connectivity. One of the hardest hit industries was the logistics industry as it tried its hardest to

The choice of road versus rail for freight is typically driven by cost. This cost evaluation needs to take account of both haulage costs and indirect costs such as the construction of terminals. Using rail typically involves building a rail terminal which is often larger and more costly than the road equivalent, and where that is the case, the operator will need to include these (extra) capital costs in their calculations.

Road haulage does have typically high economic costs in terms of pollution, highway damage, congestion and noise. The actual body that pay for these costs ends up being the Highway Authority and not the haulier. In rail terms there are less costs absorbed by Councils and more absorbed by the freight operator. This is why the Freight Facilities Grants run by DfT were popular.

Historically bulk cargoes such as construction materials and coal for power stations have been the main commodities of rail. Coal has declined with the shift in power generation to renewables and the earlier "dash for gas". Until recently, other heavy industries had not filled the gap left by

coal. In part that is because there is less heavy industry in the UK economy but also because of the gradual shift in power generation. Where offshore wind has grown, the infrastructure required is port side and near the shore.

This in effect removes coal's primary need for rail freight. Construction materials continue to be moved across the UK with the importance of the Peak District quarries increasing. With the limit of lorry movements restricted by the Peak District National Park, the train loads of aggregates have almost doubled. Where a c2400 tonne of aggregates left the Peaks to Wembley twice a week, now 1 train of c4000 tonnes works now. This is a huge argument for the attraction of modal shift and also highlights the industry's held belief that moving more on bigger trains is possible – even on paths that were designed for much lighter trains.

However, increasingly with the rise in volume of consumer goods and specialised manufacturing (in the UK and globally) and with more rail-served warehousing sites, with terminals are built across the country, the total volume and the proportion of intermodal containers and fast-moving consumer goods travelling by rail has also risen. This trend is expected to continue.

Within any one commodity group the comparison of road versus rail costs will vary by journey:

Distance: Because road costs per extra kilometre are higher than rail costs per extra kilometre, rail is typically more viable (higher mode share) over longer distances than over short distances.

Cargo quantities: Rail is normally not well-suited to small cargo volumes because it takes some time to build up enough freight to warrant running a train. This leads to infrequent and large deliveries (often inconvenient for the customer), and can lead to under-utilised railway assets.

Rail-connected: If there are rail terminals at both the cargo generator and the cargo consumer, then this removes the need for a local road haul between cargo generator/consumer and rail terminals – thus significantly reducing the costs of using rail.

It is often difficult to define mode share by commodity because commodity definitions between modes are often difficult to harmonise.

4.13 Future Freight Growth

The growth of freight in the future is heavily attributed to the increasing number of national distribution centres (NDC) and regional distribution centres (RDC) in line with the growth in online retailing and the move towards next-day delivery of a wide variety of goods. In 2050, more

NDCs are forecast within Central England, which are predicted to supply RDCs in both the North of England and in Scotland. This also results in longer length of haul by road freight, reflected by an increase in the domestic average length of haul from 93 km in 2016 to 130 km in 2050¹⁸.

Tyneside and Tees Valley in the North East have seen a significant take up of logistics and distribution space, although this has not been on the same vast scale as the major established UK logistics parks in the Midlands, South East and North West of England. These northern key logistics hubs are often based on historical geographies, some of which have connections with ports and airports (such as Newcastle International Airport and associated pharmaceutical industry) while others have developed independently.

There are several key logistics centres that serve a wide variety of commodities that are moved around, to, from, within the northern trans Pennines, including fast-moving consumer goods (FMCG), construction and support for the energy supply chain. Across the Northern trans Pennines freight is mainly moved on the road network since there are no significant intermodal locations in this region, as well as the absence of gauge clearance and capacity on rail.

In the West and Wales region, covering the areas of the Liverpool City Region, the Manchester City Region, Cheshire and North Wales, there has been significant growth in recent years in energy, health innovation and advanced manufacturing industries. The recent investment in a deep-water container terminal, Liverpool2 also reflects the aspiration of the region to increase its freight potential.

Along the Southern Pennines corridor there is a significant business and industrial presence, with a strong advanced manufacturing clustered in Sheffield, to add to Manchester's and Liverpool's specialised materials and manufacturing centres.

4.14 GB Railfreight Case Study

GB Railfreight investigated route planning for W10 gauge. The new University of Hull software for timetable planning was used. This was developed by the Liverpool to Humber Optimisation of Freight Transport (LHOFT¹⁹) project. GB Railfreight inputted a request for a W10-gauge flow from Immingham to Trafford Park and it showed the most direct route was via Diggle and that would be the route you'd choose to be best commercially was properly gauge-cleared and had the capacity during the

¹⁸ Enhanced Freight and Logistics Analysis Report, TfN, January 2018

¹⁹ [LHOFT \(hull.ac.uk\)](http://LHOFT(hull.ac.uk)) Accessed June 2021

day. The next best option that is currently W10 gauge-cleared is the route crossing across Lichfield to Burton to Chesterfield which is far further.

The Diggle route is 117 miles and the Lichfield to Burton to Chesterfield route is 205 miles. That is an additional 176 miles for the journey there and back using the second route. Both legs would be loaded with containers as this is what the Ports and operators need and want as the market is there. That means that there would be an additional 'variable track access charge' ie 'a bill' for the extra 176 miles of journey. That doesn't include the additional driver hours it would take or the fuel the train would use either.

This example clearly shows why Transport for the North and our freight industry colleagues have repeatedly called for improvements in the Diggle route through the TransPennine Route Upgrade. There is demand from operators to run the trains fully loaded and they have said that they would make this sort of flow work. There are currently very limited examples of companies showcasing and demonstrating that they would be able to make it work because Diggle is not gauge-cleared and doesn't have the capacity available to showcase the opportunity. This is also why all the modelling shows no container flows – because they are currently impossible to run. This is why the economics for this flow just do not work at the present time and needs investment in the full TransPennine Route Upgrade as soon as possible.

5 Defining our freight and logistics objectives

TfN's Strategic Transport Plan sets out the importance of moving goods across the North and freight is fully embedded into the TfN Investment Programme published alongside the STP. This section defines the proposed objectives of a multimodal freight strategy that can meet both the current and future needs of the North of England. These freight specific objectives build on the wider objectives of TfN, DfT, local authorities, National Highways, Network Rail and other key delivery partners. The objectives are presented to be modally agnostic, and are therefore equally relevant to road, rail and waterborne freight.

5.1 TfN's strategic transport objectives

The Strategic Transport Plan (STP) sets out the evidence on how improved transport connectivity will deliver greater prosperity and a better quality of life for citizens in the North of England.

The STP sets out TfN's vision:

"A thriving North of England, where world class transport supports sustainable economic growth, excellent quality of life and improved opportunities for all."

Supporting this vision are four pan-Northern transport objectives, which inform the development of the STP and TfN's work programmes:

- Increasing efficiency, reliability and resilience on the transport system;
- Transforming economic performance;
- Improving inclusivity, health and access for opportunities for all; and
- Promoting and supporting the built and natural environment.

These objectives align closely with the five foundations of productivity set out in the Government's Industrial Strategy as well as helping achieve Governments commitments to 'levelling up' and 'building back better'..

To realise the benefits of agglomeration and economic mass, the North requires faster, more efficient, reliable and sustainable journeys on the road and rail networks. Yet these existing networks have a number of challenges.

Over the last two decades, the North's railway has experienced substantial growth in passenger numbers despite a legacy of underinvestment. Much of that growth has been accommodated within pre-existing capacity, but this is no longer possible on many routes, and

most of the North's key rail hubs are now at capacity. The North's rail network lacks sufficient capacity for growth and is severely constrained by on-train congestion, low journey speeds and poor punctuality. Evidence for this can be found in the increasing difficulty of securing new or competitive paths for freight.

During the initial phases of the Covid 19 lockdown, rail passenger numbers fell sharply as people who were not key workers remained at home. The number of passenger trains that ran on the network reduced to reflect this and freight services increased. The main area of more efficient running was the ability to run longer trains because the freight trains didn't have to repeatedly wait for passenger services to pass in shorter loops that cannot hold trains that are 775m long. This increased the number of containers that were able to move key supplies of food, medical and personal protective equipment to various rail connected destinations. Also, trains could move at higher speeds because they could maintain a faster speed for longer. Large heavy freight trains take a similar amount of time to stop as any passenger or lighter freight service. But they do take longer to accelerate meaning vital time maintaining speed is beneficial instead of starting and stopping.

Where there are established freight services planned into the timetable, it was much easier to achieve the improvements quickly to respond to the needs of customers during the pandemic. The problems are more concentrated for newer freight flows rather than those which have been allocated for many years as the timetables they fit within are much more congested than many years ago.

Covid 19 presented network opportunities for the rail and freight operating companies. As we reported to the Rail North Committee from the Rail North Partnership, prior to Covid 19, Northern Rail's on-time train performance levels were 54.2% of all trains arriving on time and grew to over 77% during the pandemic. Similarly, TransPennine Express had only 37.5% of trains arriving on time and rose to 72% during the pandemic. This is mainly due to a less congested network because the as recent increases in service levels have already led to small declines in performance. Further increases following the 3rd lockdown could also lead to a decrease as the volume of trains on the network, the increase in passengers travelling and an increase in dwell time reduces the timeliness of services.

Similarly, East-West road connectivity is also a significant barrier for future growth in the North, and a key constraint to agglomeration and transforming the North's economy. Currently the M62 is the only motorway standard East-West road link across the Pennines between Derby in the Midlands and Edinburgh in Scotland. Road capacity across the Pennines is hindered by the absence of a gauge cleared route for rail

container traffic which therefore has to use road even though intermodal is now the largest and fastest area of rail traffic growth. The flows could make their way through Midlands or Scotland to achieve rail market growth but the fuel and handling costs would be extremely high making the journeys too expensive. Other major arteries, including the M1, M6, M56 and A1 (South Yorkshire) corridors, are also already heavily congested and are acting as major barriers to transforming the North's economy.

A key priority of TfN's Strategic Transport Plan is to support economic growth that is inclusive and sustainable. This means investing in strategic transport improvements that ensure that all areas of opportunity are connected, and that communities are not disconnected and further isolated. It also means protecting and renewing the high-quality natural environment in the North, which is already an asset and a reason why many people and businesses chose to live in and visit the North.

TfN's ambition is to push harder and faster towards zero emissions from its surface transport network than current Government policies and proposals. To this end, TfN are publishing a Decarbonisation Strategy alongside the Freight and Logistics Strategy. Both documents will be subjected to consultation.

This freight and logistics strategy reflects the objectives of TfN's Decarbonisation Strategy, firstly in achieving close to zero emissions from our surface transport system by 2045, and secondly in optimising the social and economic benefits from clean growth opportunities in the North.

It is clear from the suite of pre agreed TfN policy documents that Northern leaders believe rail should be encouraged to deliver TfN policy objectives on the economy, transport efficiency, and health, inclusivity and decarbonisation. Capacity and gauge clearance for Trans-Pennine freight and rail electrification are specially mentioned.

6 Proposed TfN Freight objectives

The following objectives are outlined for delivery across TfN, partners, Government, other sub national transport bodies and the private sector. They are set out to show how varied the sector is and it is important to note that no single organisation could deliver the whole suite on their own. TfN's role will be to coordinate activity and encourage partners to work together.

TfN pan-Northern Transport Objectives	(Proposed) Freight Objectives
<p>Increasing efficiency, reliability, integration, and resilience in the transport system</p>	<p>Reduce the number of incidences of unplanned closures of Major Road Network routes leading to severe journey delay and reduced air quality;</p> <p>Prioritise measures that tackle journey reliability and congestion, and support close to zero, more energy efficient movement of goods on the transport Network;</p> <p>Maximise the utilisation of rail, inland waterways and local distribution hubs to improve efficiency and support the modal shift of goods from road to rail;</p> <p>Improve the multi-modal North-South and East-West connectivity across the North reducing journey time for goods; and</p>
<p>Transforming economic performance</p>	<p>Optimise efficient and close to zero carbon flow of goods on the MRN and railway through improved flow of traffic and supported by technology;</p> <p>Increase freight data availability through developing accessible tools;</p> <p>Maximising the clean growth opportunity flowing out of freeports,</p>

	<p>clean industrial clusters and the first mile freight that flows out of ports.</p> <p>Work with partners to support the planning and development of well connected warehousing and consolidation sites on a sub regional basis;</p> <p>Work with Partners and the private sector to explore the benefits of regional freight consolidation and distribution networks and where they can be delivered close to zero.</p>
<p>Improving inclusivity, health, and access to opportunities for all</p>	<p>Reduce the impact of air pollution and noise from freight movements on the health of local communities; and</p> <p>Support our partners at a national and local level in delivering safer roads and railways.</p>
<p>Promoting and enhancing the built, historic, and natural environment</p>	<p>Reduce carbon emissions and other Green House Gas emissions in the freight and logistics sector;</p> <p>Increase electrification of rail network, and decarbonisation of road haulage through increased share of zero and low emission fuels.</p>

It should be noted that there are objectives outlined above which are mutually beneficial to each other but some mean that trade offs will be required. As we progress with applying the strategy these will be continually debated, recognising changes in national or regional priorities.

6.1 Supporting the delivery of the Long-Term Rail Strategy

The Long-Term Rail Strategy²⁰ (LTRS) formed a significant part of the evidence that informed the Strategic Transport Plan when an updated draft was released in January 2018. There was significant engagement on

²⁰ [Long-Term-Rail-Strategy_TfN.pdf \(transportforthenorth.com\)](#) Accessed June 2021

the content with partners and the private sector when it was drafted and forms the basis for our Strategic Rail activity.

The LTRS sets out a complementary, compelling and tangible set of Conditional Outputs required to realise the TfN Vision. It includes deliverables which support the achievement of the objectives, but which are subject to further assessment of deliverability, affordability and value for money.

Through the Conditional Outputs, it is intended to deliver:

- A step-change in connectivity;
- Provision of capacity within the infrastructure and train services to cater for growth;
- A rail network which customers will find easy to access and use;
- A railway which supports the communities it serves; and
- Enhanced cost-effectiveness of running the railway.

These changes can be summarised around five key themes summarised below:

Connectivity:

- Reduce journey times between the North's economic and freight centres, and between these centres and international gateways.
- Reduce journey times between the North's economic and freight centres and key centres across the UK

Capacity:

Provide the infrastructure capacity and capability to increase the permissible speed, weight, gauge and length of freight trains to cater for proven existing demand and for evidenced future demand.

Customer:

- Increase the Right-Time punctuality of passenger and freight services in the North.
- Decrease the percentage of cancelled passenger and freight services in the North

Communities:

- Improve air quality and reduce CO2 and other harmful emissions both on and about the railway estate and in wider society through modal shift to rail.

Cost Effectiveness:

- Reduce the cost per passenger mile and per freight tonne km of services in the North.

- Grow the net revenue generated by the North's passenger and freight railway whilst delivering high-quality services and inclusivity

6.2 TfN's Long Term Rail Strategy Desirable Minimum standards for Freight

The 'Desirable Minimum Standards' were agreed as part of the first LTRS and stayed in place in January 2018. There were three that related to freight and logistics. It should be recognised that the standards were agreed to be ambitious and delivered by 2050. The contents of this strategy set out how the action we take as TfN can enhance delivery of the standards. They are set out below for reference:

- 5) The North's rail network to accommodate the evolving needs of the freight market – supporting longer and heavier trains, increased path availability and additional gauge clearance

- 11) The five major ports in the North (Hull, the Humber Ports, Liverpool, Teesport, and Tyne) to be served by rail with gauge clearance allowing the latest generation of intermodal containers to be carried on standard wagons and weight capability enabling trains to operate unrestricted at the highest speed appropriate for the load

- 12) Improve the average speed of freight services in the North by 50% over the next 10 years (by 2028)

7 Existing Evidence

A review was carried out of the available strategies and plans for the UK as well as for the North specifically. This includes documents from Network Rail, National Highways, Department for Transport and other partners including Local Authorities. The benefit of closely analysing the available documents are that they show a consulted view of the freight and transport world that TfN can review progress against as well as providing with an initial list of interventions and programmes that either have been delivered or require delivering.

7.1 Key rail emerging themes

Several themes emerged from the rail literature review and industry consultation. These range from macroeconomic narrative to issues relating to policy areas (e.g. balance of freight and passenger markets in rail planning and policy development, and the dynamics between freight and the planning system), to identification of specific network locations needing intervention. A summary of themes is provided below:

- Despite the decline of coal traffic in the last decade, there has been strong growth in intermodal and construction (including aggregates) traffic in the last two decades. There is consistently strong future demand growth forecasts across documents from TfN and Network Rail.
- There is strong policy support for rail freight contributing towards decarbonisation and the net zero agenda as well as reducing congestion on the roads especially on the North/South and East/West key freight corridors.
- Rail freight is also recognised as a contributory factor towards overall economic efficiency, as evidenced by documents by DfT, NR, Rail Freight Group and others. Some benefits would be more pronounced with further electrification of the rail network – the current electrified network is too limited for widespread adoption of electric rail freight
- There is no suggestion from the evidence that has been reviewed that the market is inefficient – i.e. no concerns that freight enhancements could disproportionately benefit a single operator due to current market dominance
- The evidence suggests that the largest constraint is rail network capacity congestion and network pinch points over and above lack of electrification for freight. Evidence of capacity constraints tend to

be largely anecdotal, but this is usually evidenced by slower than historic / theoretically optimal journey times as is apparent in Working Train Timetables (WTTs). Research undertaken for this strategy shows that the current freight trains could be 23% faster if the network operated without holding freight trains in certain places either in loops or behind other services. This is making rail less competitive.

Common themes in the north include:

- The dual lack of quality TransPennine freight paths and routes with sufficient gauge clearance for intermodal traffic – this is thought to be the main contributing factor to the lack of penetration of northern ports (Liverpool, Humber, Tyne, Tees). Provision of a gauge cleared TransPennine rail route is the simplest means to take road freight traffic off M62, widely documented from a range of TfN and TfGM documents and onto rail.
- Restricted availability and quality of paths for accessing Trafford Park and other inter-modal termini included in the TfGM Rail Strategy discuss options for additional rail linked terminal capacity on top of Trafford Park as well as options for improving existing rail network to Trafford Park
- Overall lack of data sharing between freight and logistics companies means it is more complex to evidence the benefits investment in infrastructure brings, meaning business cases still rely on passenger information to build in benefits
- Key locations for congestion are on the West Coast and East Coast Main Lines such as Winwick Junction and around Doncaster
- As we previously referenced in the Enhanced Freight and Logistics Analysis, there is continued emphasis of the importance of additional rail-connected warehousing and distribution sites that minimise the distance and impact of onward 'last-mile' distribution by road, and the importance of the planning system to support the development of such facilities.

7.2 Recent and Forecast Growth Trends

There are several common themes in terms of recent commodity trends. Documents by Network Rail, TfN, TfGM and the RFG all mention the following three broad trends:

- Decline of coal traffic
- Growth of intermodal container traffic, especially from Felixstowe, Southampton and London Gateway
- Growth of construction traffic, namely aggregates from quarries.

Most freight forecasts have adopted a similar methodology – using the Great Britain Freight Model (GBFM) developed by MDST, with varying

input assumptions. While forecasts vary, they all predict ongoing growth in intermodal and construction traffic, and other commodities staying relatively constant.

7.3 Key emerging Road themes

The common road themes for the North include:

- The strength of the north relies on its potential to increase multi-modality with prospect of a shift from road to rail being one of the priorities in the agenda.
- The North's eleven ports can play an equally important role in the intermodal domain, and expand their market share dependent on the accessibility constraints both on the road and rail sphere being resolved.
- Impact of Brexit on southern ports might open an opportunity to increase the activity on Northern ports, which may result in additional pressure in the road network.
- Congestion and reliability are the main issues experienced by road freight in the Northern road network, particularly in the East-West connection due to limited capacity of the current infrastructure.
- The freight market in the North is heavily dominated by road with 87% of the tonne kilometres transported.
- Freight market in the North is expected to grow by over 30% until 2050 across all modes.
- There has been considerable recent growth in light goods traffic, driven by increases in online delivery. Cleaner, well integrated and more efficient last mile freight movements are a priority, particularly in urban areas.
- There are very few road enhancement schemes with a primary objective of supporting freight – the business case for most road enhancements is driven by time savings of individuals. This is unlike some rail enhancements which can in some cases can be almost exclusively driven by the needs of freight.

7.4 Network Congestion - Road

The key issue for road freight is network congestion. On all highway routes road freight is a minority user even though over 90% of the North's freight is moved on the road network. However, there is no existing appetite for building freight only highways or converting existing highways to freight only.

Road enhancement schemes are considered as part of a wider business case that is usually dominated by non-freight road traffic benefits. The highway schemes are for all different vehicles and are not solely proposed as freight schemes. However, TfN included some schemes within the initial Investment Programme that were freight schemes. Now there has been amendments to the Green Book process, the building of business cases is more heavily focused on developing the 'strategic' case for investment. This helps freight and logistics schemes increase their chance of securing public funding.

7.5 Highway intervention locations

Key areas of the highway network where interventions would benefit freight flows that are currently constrained include:

East West Trans-Pennine movement on:

- M62
- A66 from Tees Valley to Penrith – particularly vulnerable to weather conditions

North-South connection through:

- M1 around Sheffield
- A1 east of Doncaster
- A1 Newcastle - Gateshead Western Bypass
- A19 in the Tees Valley and North East – particular pinch point at Tees crossing
- M6 in Cheshire and Warrington

Access to 'constrained' ports:

- A5036 to the Port of Liverpool
- A63 to the Port of Hull

Freight connectivity

- Access to and from Intermodal Terminals (at Trafford Park, Leeds, Garston, Doncaster iPort Rail and Widnes) and International Airports (particularly Manchester and Newcastle)

River and estuary crossings

- Connectivity between major distribution centres and sensitive industrial clusters

Major Road Network:

- Air quality interventions in major urban centres
- Growth of last-mile distribution including to all newly allocated Freeports

7.6 Warehousing and Highway terminal issues:

One issue that has become an issue of greater importance is the requirement for warehousing. There is a shortage of freight warehousing caused by changes to the type of goods being carried and logistics operations more generally. This means that there is less demand for bulk industrial goods to be moved by road and more demand for more local distribution centres. These will house things like food shopping and items people order more frequently to reduce the journey times between the warehouse and the person who has bought the item. This is causing increasing levels of warehouses being rented. Without increasing the availability of this warehousing economic activity risks moving to locations where the rental price and locations are right but the journeys the delivery vans make will be longer.

When we consider the proliferation of Amazon warehouses over the last 10 years, the company has invested over £23 billion²¹ in UK markets in warehouse and fulfilment centres. This has caused significant changes to the road use around those areas, something that Amazon has noticed. As future plans are developed, we are aware of initial testing of rail connections to some Amazon sites and also the growth in the electrification of their fleet of delivery vehicles. Amazon procure sites with utmost care and attention. We will continue to watch and learn about the impact such large companies have on areas within the North and use this knowledge to recommend the shape of future growth to the best of our ability.

However, if TfN were to support investment in new warehousing through policy and other interventions as a stand-alone initiative this would risk only entrenching existing highway freight modal dominance.

Therefore, we will work with local authorities in support of greater logistics warehousing but also seek that such warehousing should (by default) be also rail connected where possible and appropriate for the nature of the business. This will be a challenge for the market but, as has been seen in recent developments at iPort Doncaster and with Kraft-Heinz there is a market led appetite for modal shift to and from warehousing locations. This policy recommendation will be reviewed once the future of the Planning regime is published by Government.

²¹ [About our Fulfilment Centres \(aboutamazon.co.uk\)](https://www.aboutamazon.co.uk) Accessed June 2021



UK Intermodal Terminals

Rail Network Capacity:

Network capacity is also the key issue for rail. It is a challenge in terms of the capacity of the network to accommodate either more trains reliably or flexibility around where the trains travel to or from and in terms of gauge which drives the ability to handle intermodal traffic both on the existing network and for new journeys.

The DfT Rail Freight Strategy²² from 2016 and current and emerging thinking from both Network Rail and TfN, emphasises the need to use the existing freight paths efficiently. There are existing market incentives for operators to do so, for example to ensure that trains are loaded towards the maximum loading of goods or containers and maximum lengths on the routes they travel on. This is unlikely to create the extra paths that will be required to accommodate the unsuppressed demand that underpins DfT's and Network Rail's own rail freight forecasts.

There is also a concern in the rail freight industry, which has been expressed at recent Network Rail workshops, that efficient paths may become a euphemism for "less" freight paths with freed capacity being reserved for passenger traffic. There is much debate about freight operators having capacity that they do not use. The argument for this from freight operators is that they need the flexibility to enable them to serve different locations on different days and at different times to meet their customer needs, building as much flex as they can. This helps grow the rail market in the longer term so journeys can have a little flex on the rail – a right which haulage companies simply have.

While evidence gathered for this report by counting trains on a sample of running days suggests that less than half freight paths are used, that is not the case on routes where capacity is constrained. For example, the area around Manchester. There is little or no spare capacity over the four key freight bottlenecks identified by the network capacity modelling for this report. These include the West Coast mainline north of Golborne, East Coast mainline two track section through Durham, Midland Mainline through Sheffield and across Manchester. The work has showed that rail freight end to end train times already suffer from significant additional time in order to squeeze onto the network.

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https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/552492/rail-freight-strategy.pdf Accessed June 2021

For new rail freight journeys, achieving a timetable slot on the network is currently challenging. **19%** of the end-to-end journey time for the average freight train journey is made up of congestion-related delays. If you removed the delays, then journeys would be 23% faster for all the existing services. Even doing this on the existing network (with no enhancements and investments) decreases average journey cost by nearly 8%. This cost reduction increases the attractiveness and therefore the demand for rail freight by **6.4%** nationally. This does not include the demand for routes where the infrastructure is not capable of carrying intermodal traffic, this is just for the existing market today.

This means that new journey opportunities for rail freight are more expensive and marginalised. The ultimate impact in the current climate is for shipping companies to use road transport over rail freight as it is free at the point of access onto the network and all key routes are provided through the MRN.

Government is investing heavily in rail with High Speed 2 (HS2) and building the case for Northern Powerhouse Rail which is comparatively more than road investment on a cost per tonne/passenger basis. In addition, to help rebalance the British economy, HS2 is often referenced as having freight capacity benefits. HS2 have stated: "By putting direct inter-city passenger services on dedicated high-speed lines, Britain's new high-speed railway, High Speed 2, will create more capacity on the existing railway for Britain's growing rail freight sector. As a result of enabling more freight by rail, HS2 will help deliver more of what Britain needs in a more sustainable way, as it will assist in removing thousands of lorries off our roads, reduce carbon emissions and make our motorways safer." ([Freightmas and HS2 | High Speed 2](#)).

HS2 will reduce journey times between the North and London. It will also, once the full network is built, reduce the demand of intercity trains for paths on the West Coast, East Coast and Midland mainlines which will free capacity for freight on parts of those lines.

7.7 Gauge enhancements

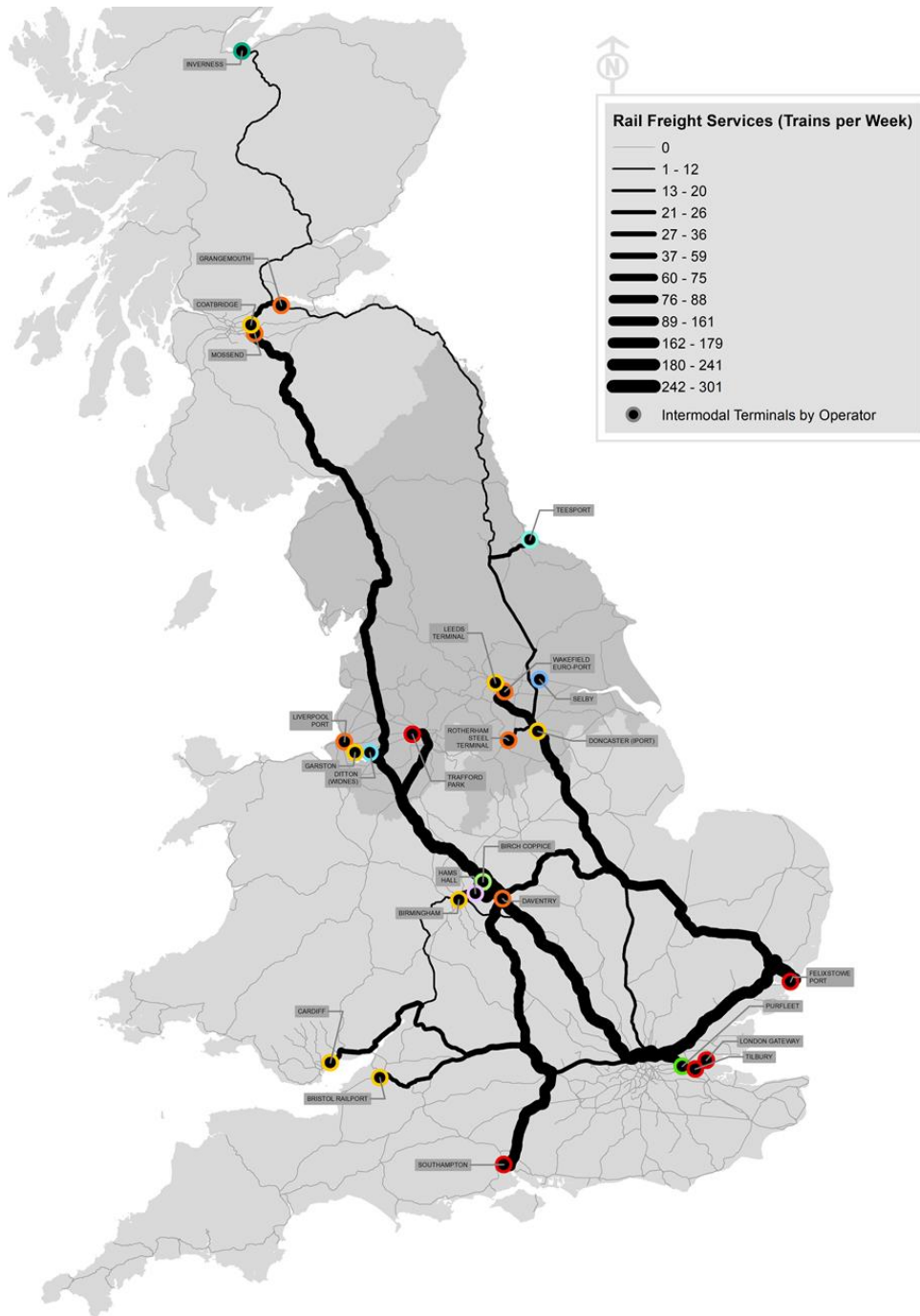
Capacity for rail is usually expressed in terms of train frequency but for freight gauge clearance is also an issue. This means how tall and wide the bridges and tunnels are and whether certain containers can safely travel under and through them. The North suffers from the fact that intermodal container services cannot physically fit across the Pennines on an east-west basis because the tunnels are too small. This means that ports and

industries in the east cannot use rail for container traffic needing to move to/from the west and visa-versa.

The ports in the West and in the East face different markets Liverpool is strong in the North America market and Hull and Immingham in the Shortsea European market and are served by different shipping services. These Northern ports are less able to serve their natural hinterland. Teesport has developed a regular container service to Doncaster by rail despite fierce road competition. This service benefits TeesPort, Doncaster and the communities on the A1. An additional service from TeesPort to the North-West should be economic to operate by rail because of the longer distance and the opportunity to spread TeesPort's rail investment costs over more traffic. However, no such service operates over this route because the trains would have to run via Litchfield. The extra distance makes rail uncompetitive. Container traffic flow on this route is likely therefore to be road based or enter/leave Britain via another east coast port. This impacts on the efficiency of the economy of the North as well its environment.

Network Rail is testing two technical solutions – one requires a smaller level of investment in infrastructure but the use of “low liner” wagons. Some stakeholders oppose the use of “low liner” wagons (1) because of their lower carrying capacity both per wagon and over a given length because of the extra space required to accommodate the shape of the wagon and (2) because such wagons would need to be built and are thought by some stakeholders to be more expensive to maintain.

The balance of approach needs to be carefully considered. Given the levelling up agenda our position is clear – that we seek assurance that we will have a fully gauge cleared route to allow freight to move on an East West basis connecting our major Freeport complexes. Understanding the alternatives is necessary but given that Southern routes have had the investment, and growth has then been seen, it is critical that the North receives the same opportunity.



UK Intermodal Rail Services per week (2 way)

Highway and rail connected terminals

The North has few rail fed connected terminals – particularly west of the Pennines. The dominant position of Trafford Park is both evidence of the desire for rail terminals in the North-West and the lack of alternatives. This makes capacity issues all the greater as Trafford Park sits close to Manchester city centre on some of the busiest rail lines in the North.

Alternative terminals on different lines may reduce the network capacity impact of intermodal freight through Manchester.

This concern about the lack of terminals is not a new issue as there is a policy position within the STP for TfN to work with Partners and the private sector to explore the benefits of regional freight consolidation and distribution networks, and network of construction consolidation centres.

TfN recommends that we could play a role in determining the best locations to develop warehousing – particularly where the opportunity for rail connection exists. If agreed by partners this could form evidence for the generation of new Local Plans once the planning policy arrangements are released by Government.

Decarbonisation:

One of the other key issues for freight is decarbonisation. Whilst the current emissions for freight do not form the largest emitter of the transport sector, they are never the less significant and the proportions will alter as other areas decarbonise.

Highway freight decarbonisation:

Central government has yet to set out a single strategy on how road freight will decarbonise. The expectation is that a combination of technology shifts, grants and taxes will encourage highway freight users to shift to electric or hydrogen vehicles. Freight is generally expressed as part of a wider approach to highways despite the obvious higher scale of the technical challenge of decarbonising freight vehicles. However, the current quickest and simplest way of decarbonising road freight is to send more by rail which even with diesel traction is 76% lower in terms of carbon emissions per tonne km. It is worth bearing in mind that rail is not yet carbon neutral either with significant distances of electrification to take place to help that to happen. Overall, it will be for the road freight sector to decarbonise and design the ability for each decarbonised vehicle to be able to carry loads that diesel vehicles can.

Rail freight decarbonisation:

NPR and other initiatives supported by TfN seek for more of the rail network in the North to be electrified. Network Rail has issued an interim programme business case for its Traction Decarbonisation Network Strategy. However, there is no certainty of funding for electrification of the wider network – and the routes used most by freight traffic (excepting sections of the Midland Mainline) tend to be lower priorities than routes

used by frequent passenger services. Network capacity issues may also drive freight onto alternative routes to the West and East Coast mainline that currently have a still less pressing case for electrification investment.

It has been suggested that hydrogen or battery operation may allow freight to be decarbonised without investment in network electrification equipment and supply. However, the power required of freight locomotives is very much larger than for passenger vehicles, and no technical solution has been proposed that will not compromise the performance of freight – thus making rail freight both less capable and more expensive.

TfN will continue to work with Network Rail and DfT to ensure certainty around the investment in electrification of the rail network. That will help industry understand the plans and timelines so they can respond with providing investment in their rolling stock that matches the delivery of the electrification work. This will offer some security so the freight operators can plan to invest in the appropriate engines that match the infrastructure.

8 Decarbonisation and electrification of freight

According to the latest DfT Transport Statistics Great Britain 2020²³, GHG emissions resulting from freight movement, which include HGVs, vans and domestic shipping account for 37% of total domestic transport emissions. Van movements have seen a particular intensification, with a doubling of van traffic since 1990 increasing van emissions by 67% comparing to 1990s levels.

With GHG emissions related to congestion as well as vehicle traffic, areas which are already constrained or showing signs of congestion, such as those identified in the Enhanced Freight and Logistics Analysis Report, including the M62, M6 and A1(M) will produce increased emissions of GHG unless interventions are undertaken.

8.1 Decarbonisation targets

In July 2018 the DfT published The Road to Zero²⁴ strategy setting out a commitment to end the sale of new conventional petrol and diesel cars and vans by 2040 and laying out steps to decarbonise road transport including freight with the aim of achieving almost every van and car to be zero emission.

In June 2019 the UK Government made the legally binding commitment to achieve net zero greenhouse gas (GHG) emissions by 2050 and in April 2021 stated their intention to align with the Climate Change Committee's sixth carbon budget, including a 78% reduction in whole economy emissions by 2035. In 2020, DfT has brought the date to end the sale of petrol and diesel cars and vans forward to 2030, or earlier if a faster transition appears feasible.

As a starting point to developing the policy that will form the Transport Decarbonisation Plan, DfT has published in 2020 the 'Decarbonising transport: setting the challenge'²⁵ which set the direction of travel, at a high level, in terms of the focus of policies and priority areas likely to be included in the governments Transport Decarbonisation Strategy.

²³ Transport Statistics Great Britain: 2020 summary, Department for Transport (DfT), published on 17 December 2020

²⁴ The Road to Zero, Department for Transport (DfT), July 2018, ([The Road to Zero \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk))

²⁵ Decarbonising transport: setting the challenge, Department for Transport (DfT), March 2020, ([Decarbonising Transport: Setting the Challenge \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk))

Within its Strategic Transport Plan (STP), TfN committed to the development of a Northern Decarbonisation Pathway to 2050, to support meeting the national net zero pathway. TfN's response to DfT's 'Decarbonising transport: setting the challenge' was one of the first steps that TfN undertook to support developing the coordinated National Transport decarbonisation Plan. In this response TfN identified key messages and recommendations to be considered by the government:

- The need for a quantified national pathway to net zero for transport by 2050, and a clear functional policy framework.
- The need for certainty on the role of national and local government, as well as STBs and the private sector.
- The need for a clear decision on road user charging for all roads.
- The need to develop an inclusive decarbonised transport solution for those living in dispersed communities.
- That government should utilise the evidence base being prepared by TfN and other STBs.
- That the North is awarded an equitable share of any funding for the trialling and development of emerging technologies.

Following this first examination of the decarbonisation challenges, TfN has developed the TfN's Decarbonisation Strategy, which sets TfN's decarbonisation trajectory, estimates the future baseline emissions under each Future Travel Scenario²⁶ and explores the likely level of policy commitment required to bridge the gap between the forecast emissions under the Future Travel Scenarios and the required emissions under the Decarbonisation Trajectory (known as Policy Gap). The result of this analysis forms TfN's Decarbonisation Pathways and provides the focus for related policy recommendations and TfN's priority decarbonisation actions to 2025. The summary table of these actions for freight is included at the end of this chapter.

8.2 Decarbonisation challenges

The NIC report²⁷ emphasises the importance of regulatory certainty and consistency in driving positive innovative changes in the freight and logistics sector. A regulatory framework that sets out policies that consider and encourage technological advancements is fundamental to achieving the net-zero pathway. Uncertainty on future freight regulations, such as the type of alternative fuels technology to adopt, creates significant challenges for both freight industry and planning of infrastructure.

²⁶ Further detail on what the future travel scenarios consist presented in Chapter 5, section 'Future scenarios and uncertainty'

²⁷ Future of Freight – Interim Report, National Infrastructure Commission (NIC), December 2018

While the technology for zero emissions cars is well advanced, there is more uncertainty about the optimal technology for zero emissions HGVs. This provides a significant challenge for meeting sales targets for zero emissions HGVs that TfN has set out for the next 25 years, presented in the table below.

Table 1: TfN’s Decarbonisation Strategy pathway

		2025	2030	2035	2040	2045
ZEV share of sales	Cars	55%	100%	100%	100%	100%
	Vans	40%	100%	100%	100%	100%
	HGVs	26%	44%	72%	100%	100%
Rail decarbonisation	Co2 reduction on baseline	0%	25%	75%	100%	100%

Hydrogen powered delivery vehicles which emit no tailpipe GHG nor any other harmful exhaust gases, are likely to have a crucial role in achieving the carbon targets. However, there are several barriers and challenges, ranging from providing adequate refuelling infrastructure to funding support, production technology and cost. Technology trial projects would provide essential evidence for the feasibility of different HGV technologies. With the support of robust strategies that promote the adoption of alternative fuelled freight vehicles (decarbonisation strategies, funding, aligned strategic transport plans) and by gathering evidence through demonstrators there is an opportunity to raise the confidence of HGVs fleet owners and leverage regional partnerships in the North to purchase zero emission HGVs in bulk.

Within the North, many Local Authorities have already taken action to drive the change towards alternative fuel with EV Charging initiatives to reduce carbon emissions; however most of the initiatives are focused on private vehicle users since there is still a lot of uncertainty about the optimal technology for zero emission HGVs.

A priority activity identified within TfN’s Decarbonisation Strategy is to undertake or facilitate a pan-northern hydrogen transport refuelling strategy, to provide a ‘look-ahead’ of what an effective hydrogen refuelling network for the north could look like, servicing both HGVs and rail. Taking into account factors related to the supply and transport of hydrogen, as well as the spatial requirements of refuelling facilities, the study would provide an important part of the evidence base upon which both policy makers and freight operators can begin to make future investment decisions.

Although freight operators are already strongly incentivised towards efficiency, some opportunities for improvement, particularly in relation to reducing vehicle mileage and increasing vehicle efficiency are missed due to barriers in terms of information sharing between operators. Data democratisation measures, would ensure that all freight operators both large and small would again be able to make operational and investment decision based on robust and current evidence.

Last mile freight deliveries using active modes can also contribute to achieving the national net zero goal. Utilisation of cargo and e-cargo-bikes can help deliver low or zero carbon delivery networks, alongside demand management measures such as promoting and incentivising the use of green shipping options by both shippers and consumers.

Freight consolidation at different stages of the transport chain, from the procurement to the last-mile delivery, also gives an opportunity to reduce carbon emissions. By optimising the parcels transported in each vehicle and using the vehicle capacity more efficiently it is possible to reduce the number of goods vehicles trips which leads to a reduction in carbon emissions and congestion, by potentially removing a number of vehicles from the road network. Micro-consolidation centres can also make the use of cargo and e-cargo bikes more effective.

In November 2021 TfN's Board approved the Decarbonisation Strategy which was widely consulted upon and supported by partners and industry. The freight priority actions contained and agreed within the strategy are presented below:

TfN's Priority Decarbonisation Actions: Freight

TfN Role	TfN Decarbonisation Action	Scope	Timeframe
Supporting	Stakeholder Priority - SD9: Low carbon urban freight scenarios.	Research on appropriate place-based, low carbon, urban freight (last-mile) solutions in the North.	Pre-2025
Leading and Supporting	Stakeholder Priority - CGA7: Developing and supporting partnerships to consider zero carbon, port to port freight corridors.	Exploring the potential for our partners (ports, local authorities and delivery authorities) to work together to deliver effective 'port	Pre-2025

		to port', multi-modal, hydrogen and/or electric refuelling corridors across our region. Many of these corridors are identified within the Strategic Development Corridors defined within TfN's Strategic Transport Plan.	
Supporting	PGA2: Facilitating large ZEV truck trials in the North.	Work with local authority partners and National Highways to facilitate large ZEV truck trials in high traffic corridors in the North.	Continuous
Supporting	PGA3: Support partners to aggregate large orders of ZEV vans, truck and buses across the North.	Current ZEV production will not meet the demand required to hit our targets. By helping to aggregate demand from stakeholders across the North, significant numbers of vehicles would be drawn to the region and would signal to manufacturers that the regional demand is present.	Continuous
Supporting	PGA12: Supporting freight information democratisation schemes.	Working with and influencing government to support information democratisation schemes that make the latest information on the best efficiency schemes and	Continuous

		technology available to everyone.	
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9 Road freight interventions and measures

Potential road freight interventions range from road freight policies focused on air quality, decarbonisation, safety and efficiency to physical improvements of the road network infrastructure. This section examines each of these areas and pulls where appropriate on a number of the undertakings within TfN's Decarbonisation Strategy to ensure that both strategies are completely aligned.

9.1 Potential detailed road freight policies and measures:

- A thorough assessment is recommended to be undertaken on air quality across the TfN region to measure the adverse impact that the increasing number of freight movements is likely to have on the northern population;
- Work with local authorities to facilitate innovative urban delivery trials focused on the use of active and electric modes to deliver parcels in the urban environment (cargo-bikes, e-cargo bikes, portering);
- Work with local authorities to assess the opportunity of introducing consolidation centres (ranging from micro to regional consolidation centres) to reduce the number of freight trips in urban centres, where air quality and congestion is particularly challenging;
- Assessment of current HGV parking provision and provide suitable parking sites to meet the current and future demand (ensuring future proof solutions in line with alternative fuels uptake);
- Introduction of Smart and connected road networks that link Major Road Network routes and distribution centres and warehouses (complementing the highways' improvement measures proposed in the Road Investment Programme) to monitor traffic levels, improve incident management, provide better customer information and increase journey time reliability;
- Examine the potential of introducing HGV only lanes on strategic road corridors; and
- Detailed data collection of freight movements at corridor level but also in urban centres.
- Working with and influencing government to support information democratisation schemes that make the latest information on the

best efficiency schemes and technology advice available to everyone.

- Work with local authority partners and National Highways to facilitate large ZEV truck trials in high traffic corridors in the North.
- Support partners to aggregate large orders of ZEV vans and trucks across the North, to signal to manufacturers that the regional demand is present.
- Exploring the potential for our partners (ports, local authorities and delivery authorities) to work together to deliver effective 'port to port' multi-modal, hydrogen and/or electric refuelling corridors across our region.
- Research on appropriate place-based low carbon, urban freight (last-mile) solutions in the North.
- Supporting a pan-northern hydrogen transport refuelling study, providing a 'look-ahead' as to what an effective refuelling network would look like, to be used as evidence by policy makers and freight operators in their investment decisions.
- Engaging with emerging hydrogen partnerships in the North to support the development of a viable business case for hydrogen for first mile freight applications and provide confidence to the supply chain.
- Developing a regional ZEV charging framework, including coverage of the Major Road Network and interaction with local needs and networks. This includes consideration of the needs of cars, vans and HGVs.
- Increasing awareness of fuel-efficient driving styles.

9.2 Road freight decarbonisation

TfN's decarbonisation strategy states that:

1. In order to shift towards Zero Emission Vehicles (ZEV) TfN should invest in Technology demonstration projects to provide evidence for the feasibility of different HGV technologies and the necessary infrastructure to support them. Specific measures include:
 - Develop a pan-northern, low-carbon charging infrastructure plan, to ensure effective consideration of longer, trans-boundary road trips; including consideration of a charge point procurement framework for use by partners and the identification of optimal locations for high-power charging hubs across the North, with input from local authorities and the Distribution Network Operators (DNOs);
 - Work with local authority partners and National Highways to facilitate large ZEV truck trials in high traffic corridors in the North; and

- Work with local authorities and freight stakeholders to help aggregate large orders of ZEV vans and trucks across the North.
- 2. TfN will work with the government to support information democratisation schemes that make the latest information on the best efficiency schemes and technology, available to everyone.
- 3. Through TfN's policy positions and communication and engagement activities, TfN can work with partners to increase public awareness of fuel efficient driving styles and the associated environmental and financial benefits.
- 4. Undertake or support a pan-northern hydrogen transport refuelling study. Provide confidence to users about the future path of the technology, in particularly with regards to priority application, e.g. hard to electrify rail services and long-haul HGVs.
- 5. Developing and supporting partnerships to consider port-to-port, multi-modal, zero carbon freight corridors, optimising the economic benefits that our freeports and clean maritime clusters can generate for our region.

9.3 Physical solutions to the enhance the road of the infrastructure

The list of major schemes identified in TfN's Road Investment programme consists of highways improvement schemes to enhance strategic connections across the North, and to improve the capacity, connectivity, resilience and access to major conurbations, economic centres and industry & logistics clusters, international gateways and intermodal terminals across the region to support economic growth and competitiveness of the northern region. These include A1 and M6 connectivity and dualling schemes, port access work both locally to the ports and wider connecting infrastructure such as the A66 and A1079 and river crossings, access to airports such as Carlisle Lake District and Liverpool John Lennon, M62 improvements which currently connect warehouse clusters and improvements that connect the North to other areas such as the A15 into Lincolnshire and the A19.

The schemes proposed in TfN's Road Investment Programme provide a significant contribution to addressing the network issues identified in the TfN Strategic Development Corridor studies. The suite of schemes aims to improve the East-West and North-South transport connectivity, particularly in terms of journey time reliability and capacity, vital to link relatively closely located northern economic clusters.

10 Key rail interventions

10.1 Network locations recommended for further analysis

Like road, there are a number of rail freight investment schemes and programmes highlighted within the TfN Investment Programme. These include port related gauge enhancements and access for the Port of Hull, Port Salford, Liverpool and Teesport. Also reference to warehousing development sites such as Parkside. Additionally, there is reference to WCML enhancements and the need for a gauge cleared route along the East West axis across the North.

The need to understand the Castlefield corridor and the northern section of the East Coast mainline including the need for potential line re-openings to reduce congestion.

Further work to address the needs for the schemes and programmes highlighted above is referenced within the recommendations of the Strategy and will form a key part of the required work we undertake across TfN as we progress.

Specifically identified schemes within the rail network from both the TfN Investment Programme and other funders such as Network Rail include:

- TransPennine Gauge cleared East West route to the Ports
- Sheffield area capacity improvements
- Castlefield corridor and Trafford Park
- East Coast Main Line capacity
- North East freight enhancements (passing loops and port connections)
- Selby to Port of Hull gauge and journey time improvements
- Port of Liverpool to WCML enhancements
- Parkside enhanced freight connectivity
- WCML freight enhancements
- Port Salford rail freight enhancements

10.2 Rail connected terminal and warehousing development

In addition to the local capacity issues at Trafford Park there is a need for more terminals across the North. This has been strongly advocated for in the literature review and by the private sector and TfN partners.

In future, with the modelling capability we are growing at TfN we would be in a strong position to work with local authorities to advise on the best location for rail connected terminals and offer technical support. TfN may

wish to consult with local authorities so such developments are supported across the North and not just by some local authorities. Given TfN's position as a sub-national transport body and our links to partners and other private sector organisations, it would be a natural role for us to take.

There is anecdotal evidence of planning permissions for intermodal terminals being sought for sites where the rail element was challenging to deliver. TfN's technical advice could be used to support local authorities who wish to ensure that they do not grant planning permission for a rail connected terminals where the railway network cannot be easily used.

10.3 Express Logistics – Parcels on rail

The Rail Freight sector is experiencing an uplift in freight services from new market entrants and Express Logistics is a new entrant that presents an exciting opportunity to further support rail freight growth. With socio-economic trends towards urban repopulation, same-day delivery, increased online spending activity, and urban convenience grocery retail formats, demand for the delivery of consumer goods into urban areas is growing. Overlaying this with increasing concerns over urban air quality, and road congestion, there is an opportunity for the development of a rail haul offer for consignments of parcels and light cargo directly into urban areas.

Express logistics comprises the movement of parcels traffic and its operations can take various modes which can be categorised as:

- **Space on Passenger Trains:** where capacity allows, passenger services will provide dedicated space for parcels traffic directly into the station terminus.
- **Dedicated Train into Station:** passenger rolling stock will be converted to accommodate parcels traffic to provide a logistics solution directly into the station terminus.
- **Dedicated Train into Distribution Centres:** converted passenger rolling stock will operate directly between depots.

High Speed Logistics is able to use passenger stock, therefore growth within the sector should focus on opportunities to convert former and current passenger rolling stock to safely transit roll cages, parcels, mail sacks, and pallets. Express logistics traffic is often time-sensitive and therefore customer expectations dictate that next-day delivery and

delivery tracking technology must be incorporated into the rail freight offer.

A unique aspect of Express logistics in the rail freight sector is that parcel traffic can be delivered directly into stations located in urban centres; therefore any future developments of stations should consider the provision of facilities for express logistics such as: handling roll cages, or providing on-site sorting facilities. Express Logistics typically operate using electric traction, therefore continued investment in electrification of the rail network is integral to supporting growth in the market and facilitating operations to additional locations.

Ongoing investment by Freight Operators to repurpose passenger units to accommodate parcels traffic highlights the likely growth in this market. To-date various trial services have been undertaken, emphasising the opportunity to increase rail's share in this market and introduce new customers to rail freight.

11 Freight Future Scenarios

The strategy so far has been developed using suites of existing evidence and analysis. We have ambitious plans to grow and improve the modelling and analysis capability within TfN to support and develop the way we build business cases.

The following sections detail how we will mobilise the activity. Using TfN's Future Travel Scenarios as a starting point, we have undertaken further work to produce forecasts of freight movements associated with potential changes in future land-use, economic growth and different policy outcomes.

11.1 Evidence of Freight Future Scenarios

TfN commissioned MDS Transmodal (MDST) to undertake a freight future scenarios study in 2020. The study takes the land use and qualitative definitions of individual scenarios specified by TfN and applies them within the Great Britain Freight Model (GBFM) to provide quantitative assessments of the distribution of economic activity, economic growth, road network performance and technological take-up.

The freight measure options that are used to structure the assumptions of the four future scenarios include:

- Carbon pricing, which reflects a policy environment that encourages the use of "greener" transport and leads to differential increases in fuel costs across modes;
- Road pricing, which leads to increased road costs, varying by road type;

- Autonomous vehicles, which leads to differential rates of uptake through time across modes generating mode specific reductions in vehicle operating costs;
- Warehousing, which defines whether or not new warehousing location is increasingly concentrated around railheads in the future
- Brexit impact, means additional costs of trading with the EU on customs checks, cabotage and drivers' wages; and
- Larger ships, showing the trend towards larger vessels especially on longer sea crossings.

Population growth differs by area type to reflect different spatial planning measures seen across our 4 TfN Future Travel Scenarios. Scenario Prioritised Places has the highest growth in rural area, indicating a fair redistribution of economic activities across all types of areas. The assumptions made for employment, GVA and population growth are all specified by TfN and consistent with the car future travel scenarios assumptions.

Table 2 provides a summary of freight measure assumptions made for each future scenario.

Table 2 Summary of Freight Future Scenarios Model Assumptions

Scenario/input	Just about managing (JAM)	Prioritised places (PP)	Digitally distributed (DD)	Urban Zero Carbon (Uzc)
Population	As provided by TfN			
Employment	As provided by TfN			
GVA/head	As provided by TfN			
Labour cost	As implied by TfN's GVA / head nationally			
Fuel	WebTAG			
Carbon pricing	zero	zero	£1/litre eq.	£1/litre eq.
Road pricing	zero	Non-user costs added to user costs	zero	Non-user costs added to user costs
Autonomous vehicles	moderate	low	high	moderate
Land use	Neutral	Rail based	Neutral	Rail based
Road network performance	Base year HGV distance and time skims retained for future scenarios			
Brexit	Extra £100 on all driver-accompanied HGV ferry services			
Larger ships	Larger ships on longer crossings			

Key findings from the study are:

- Road is likely to continue to be the most heavily used freight mode in the UK, however, all four freight future scenarios have shown a certain degree of mode shift from road to rail comparing to the current baseline situation. Just About Managing sees a future that is led by markets without much increase in political direction, economic growth continues at a moderate rate. It therefore has the least mode shift among all freight future scenarios.
- Digitally Distributed is driven by technical advances and has a high uptake of autonomous vehicles. Freight takes advantage of lower road operating costs and therefore has the second least mode shift from road to rail.
- Urban Zero Carbon is led by attitudes to climate action and urban place-making, it shows sees Government policy in embracing publicly available transit and active modes. It therefore shows the highest mode shift to rail. Table 3 provides a summary of key observations from the freight scenarios modelling work. In comparison to a 5.9% rail Tonnes KMs mode share in 2018, Just About Managing (JAM), Prioritised Places (PP), Digitally Distributed (DD) and Urban Zero Carbon (UZC) have a rail mode share of 6.2%, 12.7%, 7.7% and 14.8% respectively for year 2050.

Table 3 Freight Future Scenarios Modelling Output Summary, Year 2050

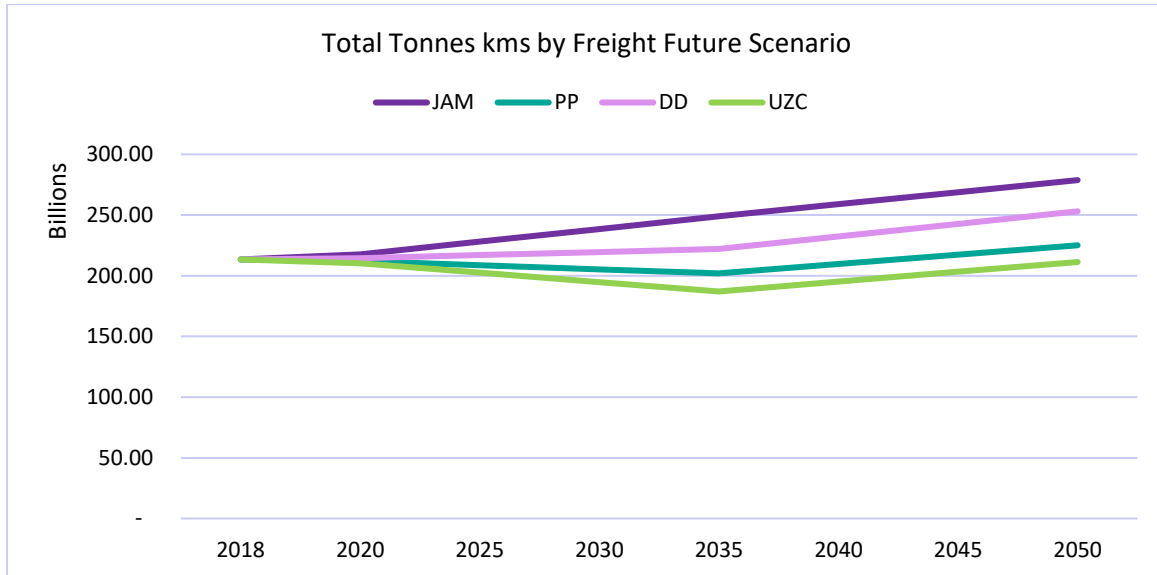
	Population	Road Pricing and Land Use	Autonomous Vehicles	HGC PCUs	HGV PCU kms	Tonnes	Tonnes kms	Rail Modal Split
2018	-	-	-	-	-	-	-	5.9%
JAM	+	Neutral	Moderate	● 7.4%	● 33.7%	● 6.1%	● 31.1%	6.2%
PP	+	Non-user costs added to user costs and rail based land use	Low	● 9.4%	● 11.7%	● 7.1%	● 13.7%	12.7%
DD	++	Neutral	High	● 8.7%	● 23.1%	● 6.7%	● 20.8%	7.7%
UZC	++	Non-user costs added to user costs and rail based land use	Moderate	● 10.5%	● 5.9%	● 7.6%	● 9.4%	14.8%

2018 - 2050 output analysis

- Scenario UZC has the most significant reduction in HGV PCU KMs comparing to scenario JAM (a decrease of 27.8%). This is a result of having the highest road costs as a measure of decarbonisation policies which come to the fore. The high road freight costs have led to longer distance freight demand switching from road to rail, it has also encouraged relatively rapid growth of shorter distance hauls.
- Total tonnes KMs shown in Figure 1 refer to all road freight including domestic road, European and non-European inland freight through ports. Scenario JAM shows the highest tonnes KMs with steady growth from 2018. Although scenarios DD and UZC have

assumed the highest population growth which means more goods movements in these scenarios, carbon pricing has dampened down the freight traffic in a greater scale and therefore led to lower tonnes KMs comparing to scenario JAM.

Figure 1 Total Road Freight Tonnes KMs for All Freight Future Scenarios



- Table 4 provides a summary of rail freight tonnes demand by commodity category. It shows a significant growth in intermodal rail freight demand particularly in scenario UZC. This is due to several assumptions favouring rail over road in this scenario.
- Likewise, there is a large growth in construction materials demand in scenario UZC. This is also due to the rail-favouring assumptions made for this scenario, and an assumed growth in the market as the market sees an increase in the use of “super-quarries” carrying aggregates over long distances by rail, at the expense of local quarries typically served by road.
- Catering for this rail freight demand would take a large investment in terminals and wagons, and would require sufficient capacity to be available on the network.

**Table 4 Rail freight tonnes demand by commodity category
(Annual million tonnes)**

	2016/2017	2035 1_J AM	2035 2_P P	2035 3_D D	2035 4_U ZC	2050 1_J AM	2050 2_P P	2050 3_D D	2050 4_U ZC
Intermodal	19.07	28.67	71.66	35.09	84.84	39.16	98.69	46.59	115.17
ESI Coal	6.28								
Biomass	6.47	7.52	7.56	7.75	7.74	7.52	7.61	8.10	8.05
Waste	1.23	1.23	1.22	1.25	1.25	1.23	1.22	1.28	1.29
Construction materials	23.55	22.19	41.97	31.99	42.01	35.41	58.16	41.25	60.52
Spoil (construction)	0.74	0.44	1.30	1.06	1.30	1.12	1.66	1.35	1.69
Petroleum	4.71	4.71	5.30	5.04	5.42	4.92	5.42	5.27	5.64
Chemicals	0.90	0.88	1.05	0.98	1.09	0.94	1.10	1.05	1.17
Industrial Minerals	1.34	1.18	1.85	1.56	1.87	1.48	1.92	1.71	1.97
Metals	7.44	6.94	9.86	7.84	10.08	7.99	10.09	8.64	10.57
Automotive	0.45	0.48	0.55	0.52	0.59	0.50	0.55	0.53	0.60
Iron Ore	4.26	4.26	4.28	4.39	4.39	4.26	4.30	4.59	4.58
Coal Other	1.95	1.95	1.96	2.00	1.99	1.95	1.96	2.06	2.05
Other	0.33	0.41	0.68	0.43	0.72	0.43	0.68	0.45	0.74
Empty returns for containers carrying bulks	0.41	0.42	0.44	0.43	0.46	0.42	0.44	0.44	0.47
Engineering	6.66	6.66	6.65	6.71	6.71	6.66	6.65	6.78	6.78
Grand Total	85.79	87.92	156.34	107.04	170.46	113.98	200.44	130.09	221.30

- Taking M62 corridor as an example, Table 5 shows a summary of road and rail tonnes KMs for each freight future scenario. With limited rail freight network and facilities, rail freight mode share is dramatically low. There is also no opportunity for a greater mode shift from road to rail. It implies that without adequate rail infrastructure in place, there would be relatively limited space for the exogenous policy interference to take effect for the purpose of encouraging modal shift from road to rail.

Table 5 Road and Rail Freight Demand for Future Scenarios – M62 Corridor

	Tonnes_km road	Tonnes_km rail	Rail modal split
2018	8,168,354,747	41,336,675	0.50%
2035 JAM	8,372,585,961	56,554,386	0.67%
2035 PP	9,208,706,338	149,326,691	1.60%
2035 DD	8,515,862,272	58,151,472	0.68%
2035 UZC	9,329,308,134	177,979,248	1.87%
2050 JAM	8,402,562,014	60,600,598	0.72%
2050 PP	9,532,439,376	245,551,796	2.51%
2050 DD	8,622,432,842	63,378,171	0.73%
2050 UZC	9,807,220,365	295,309,568	2.92%

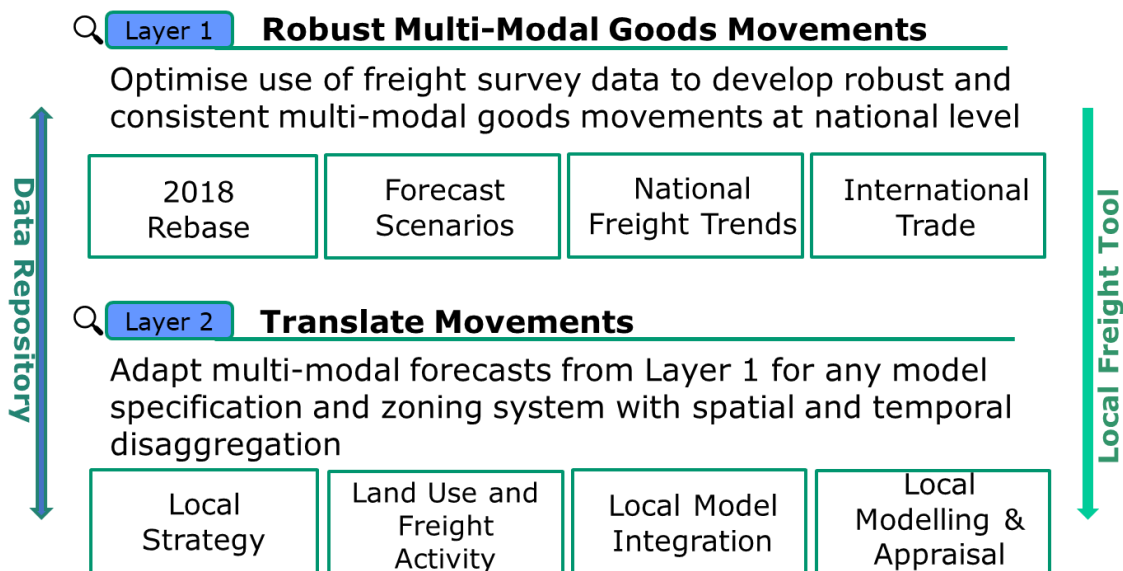
12 TfN Freight Modelling and Analysis

12.1 Freight Analysis Strategy

Over the past years, TfN worked on developing the freight modelling and analysis evidence to support TfN's Strategic Transport Plan and Northern Transport Charter. The focus has been to improve the quality of freight data and models, assess the multi-modal freight impacts and the freight factors external to the transport investment.

TfN has been creating an environment for local freight planning, modelling and appraisal, as well as building robust and consistent freight analysis for the North. TfN's Technical Assurance, Modelling and Economics (TAME) team has identified a two-layer freight modelling and analysis strategy as shown in Figure 2.

Figure 2 TfN Freight Modelling and Analysis Strategy



Layer 1 focuses on developing robust multi-modal annual movements. This layer maps a strong foundation for the local freight analysis for the North. Layer 2 undertakes freight analysis at the regional and below regional level. The freight data and models are integrated with the other TfN Analytical Framework models in this layer to support TfN Investment Programme studies and freight analysis requirements in the North.

12.2 TfN Freight Models

TfN is developing its freight modelling and appraisal capacity and aims to build a holistic freight analysis eco-system to support TfN investment programmes and freight strategy studies. TfN also has the objective of supporting freight analysis requirements from Local Authority Partners and the other stakeholders, promoting efficiency and collaboration across public sector activities.

The models enable the multi-modal freight assessment across road, rail and maritime, allowing more focused temporal, spatial and logistical advances to be made. Table 6 lists the freight models that are used in TfN.

Table 6 TfN Freight Models

Model Name	Owner	Model Description
Great Britain Freight Model (GBFM)	MDS Transmodal	<ul style="list-style-type: none"> • Strategic four-stage freight model • Multi-modal (rail, road and water) freight choice model • Inclusion of domestic, European and non-European route choice and demand integration • Capable of comprehensive forecasting scenario testing
Local Freight Tool	Transport for the North (TfN)	<ul style="list-style-type: none"> • Annual tonnes to local freight traffic conversion by GV vehicle type and road type with spatial and temporal refinement • A dedicated van modelling tool (NLGV) • Dealing with misalignment of forecasting demand between different models • Flexibility of zoning and cost conversion
Freight Meta-Model	Transport for the North (TfN)	<ul style="list-style-type: none"> • Interpolation of freight forecasting demand for a range of policy query / dimensions • Current policy dimensions include unified change in road cost, population and employment growth and warehousing growth • Current development to take account of potential spatial variations

TfN Freight Data Repository (prototype stage)	Transport for the North (TfN)	<ul style="list-style-type: none"> • Open-source multi-modal freight data collection • Modelled data visualisation demonstrating more detailed spatial granularity • Online and offline data requests
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In July 2020, TfN commissioned MDS Transmodal (MDST) to deliver a 2018 version of the GBFM model. The model adopted the most up to date input data for road, rail and maritime and focused on improving the accuracy of the output data and the robustness of the conversion process used in the model. This new model version has been installed on a TfN server.

The Local Freight Tool and Freight Meta-Model build an interface to translate the mainline GB freight activities and annual freight demand into a format that can be used for the local freight policy analysis. The Local Freight Tool focuses on improving the spatial and temporal accuracy of the annual tonnage to local freight traffic conversion process. The Freight Meta-Model is a policy scenario testing tool, which interpolates freight forecasting demand for a series of policy dimensions.

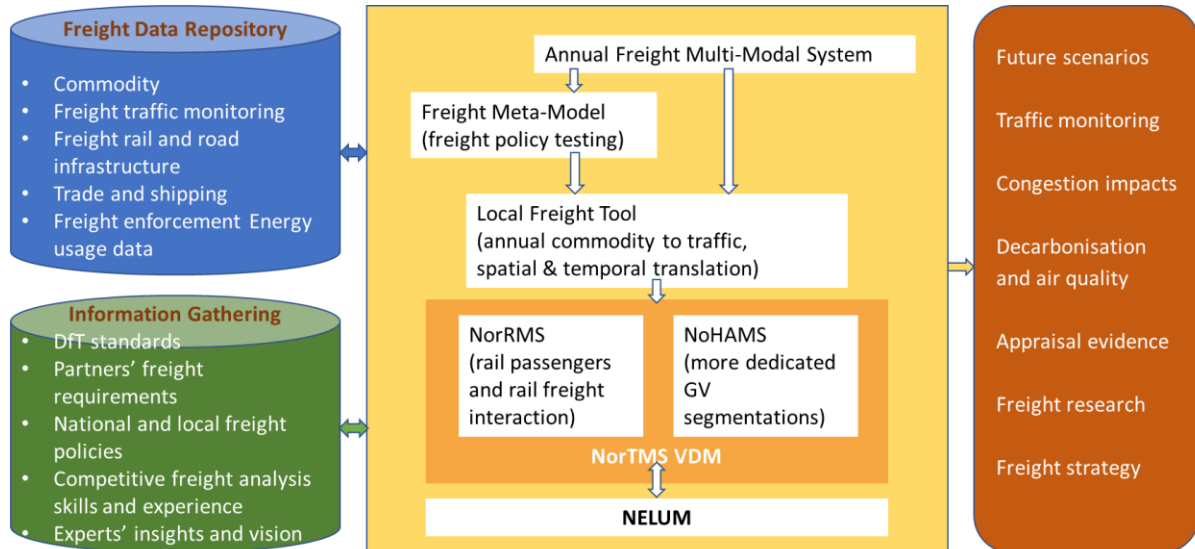
The Freight Data Repository is a collection of structural freight data that is presented in a data monitoring and maintenance system. During the development discovery stage, TfN has identified a number of key freight data challenges, including:

- The general lack of detailed freight data, both in terms of the specific origins / destinations, freight routes taken, position in the supply-chain and commodities carried;
- Data 'patchiness' and the lack of depth/inconsistency of data across regions, modes and sectors;
- Over reliance on small sample/data set sizes to accurately represent the wider freight system (and deficiencies in accuracy / relevance as result of this in existing key data sets); and
- The lack of consistent data models and standards; and the ability to usefully link data sets between different sectors and freight transport modes.

The Freight Data Repository aims to tackle the freight data challenges, deliver a convenient approach for users to easily search, query and download open source data. The Freight Data Repository also maintains the freight demand and traffic data produced using TfN models. The modelled data provides more disaggregated segmentations in terms of vehicle type, area type, spatial distribution and time profile.

Figure 3 provides a high-level overview of TfN freight analysis operating model.

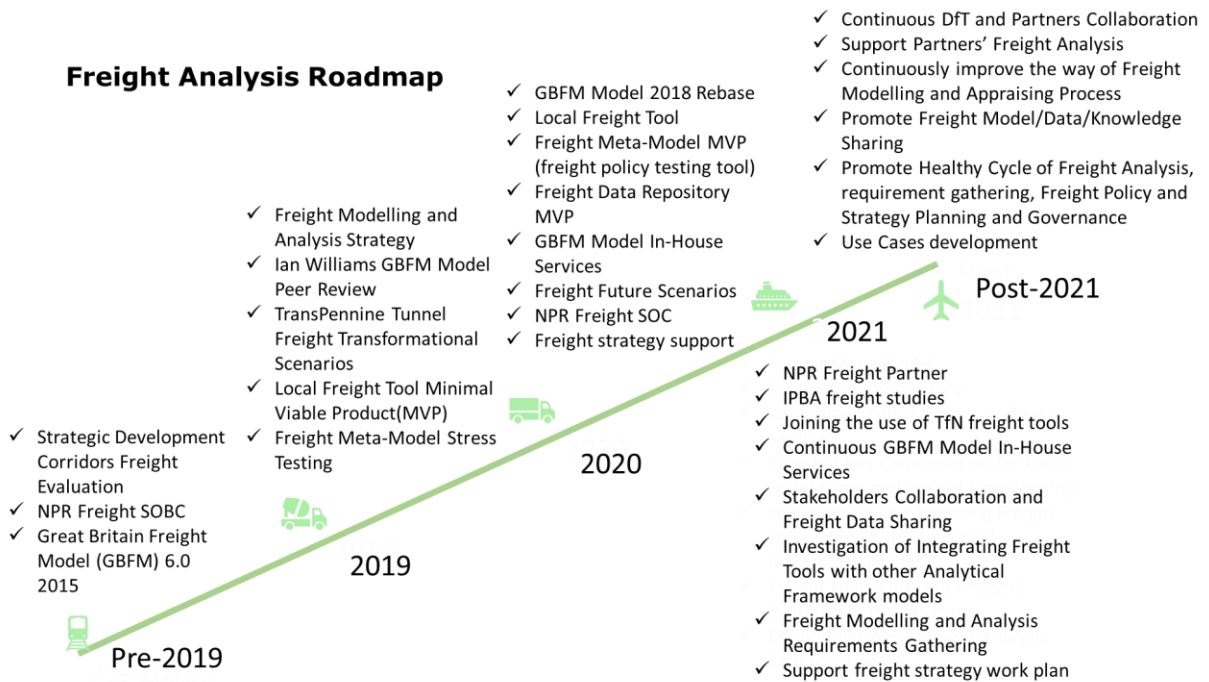
Figure 3 TfN Freight Analysis Operating Model



12.3 TfN Freight Analysis

TfN is working collaboratively with internal and external stakeholders and delivers evidence base to support freight economic and environmental studies. Figure 4 provides a summary of TfN modelling and analysis activities. In the coming year, TfN will continuously upgrade its freight models and promote its freight analysis on a wider spectrum. TfN will focus on the freight analysis pipeline being identified through TfN Freight Strategy and work closely with partners to deliver multi-modal freight business cases.

Figure 4 TfN Freight Modelling and Analysis Activities



13 How will we deliver this Freight and Logistics Strategy?

Currently, as was the position when we launched the Strategic Transport Plan in 2019, the role of TfN is to provide Statutory advice to government on key investments in infrastructure related to the North. This strategy sits very much within the spirit of that. However, work on the Northern Transport Charter by the Board outlines the vision that would enable TfN to have a greater role in decision making and funding allocation.

In the current climate TfN will continue to be active in the right places to support the development of Freight and Logistics programmes of work that will benefit the North. This involves working closely with the Department for Transport's teams and helping them join up activity where possible. This involves the data and analysis activity, ports and maritime, freight grants and the Future of Freight.

We also work closely with Network Rail on securing investment in freight schemes that benefit the North. This also includes supporting schemes that provide better access to the North through improving the network that sits outside our boundary. A key example of this is work at Ely will help improve journey times of flows from Felixstowe to the North West, vastly improving the viability of the journeys made.

This is a crucial point, the freight and logistics outlook for the North is significantly different to that of passengers. There are journeys that travel through the North, those that start, those that end and those that stay within the North. All these journeys need to be carefully considered so that the experience of freight operators is coherent, smooth and reliable to ensure we maximise investment opportunities for the area.

The team working on setting up Great British Railways has pleasingly already contacted areas of TfN, including for Freight. As the organisation is set up and develops, we expect to play a leading role in securing investment for the North of England to ensure the new organisation's name lives up to its ambition.

Work progressing on the Investment Programme Benefits Analysis puts TfN in a sound and powerful position to understand the benefits of how the Investment Programme can be delivered and broadly the best sequence the activity should be done in. There are rail and road schemes within that work that are stand-alone freight schemes.

Work planned by the TAME team at TfN includes looking at how best to appraise a freight scheme using the new tools and understanding we have developed. This will allow stronger Strategic Cases to be developed in line with the Government's recently reviewed Green Book. It will also help

those projects where freight benefits as well as passengers and will be able to better articulate these. All adding value to the development of stronger business cases that will help drive the Levelling Up ambition that Government has for the North.

13.1 Recommendations and Governance

The key recommendations presented to Board to approve for the Transport for the North Freight and Logistics Strategy are set out below. They will be discussed and approved for consultation by TfN Board. Then there will be opportunity for the people active in the sector to contribute further through the consultation.

Whilst the consultation is progressed, TfN will begin work on the freight analysis and strengthening business cases as this is a key priority and has already been agreed within the TfN Business Plan for this year.

It must be noted that these recommendations remain draft until approved as a final version by TfN Board in Autumn 2021. Once agreed, they will be turned into an action plan that will be monitored by the TfN Strategic Oversight Group, supported by the TfN Freight and Logistics Working Group as required.

The proposed Freight and Logistics Strategy recommendations are:

1. Ensure the freight dimension is advocated strongly within the Strategic and Economic Cases of the Investment Programme. Work will add value to decarbonisation of road and rail freight in light of delivering progress of the TfN Decarbonisation Strategy Action Plan. TfN is continuing to improve methods for appraising user and non-user benefits that freight brings to the economy. This includes partner led schemes – adding support where required;
2. To develop policy levers that support the development of new freight warehouse location clusters in the North. Particularly,
 - a. where there is more detailed forecasting of the warehousing market across all modes showing opportunity for the North;
 - b. where such terminals are rail connected; and
 - c. where such terminals are not on the same rail line as Trafford Park or existing rail terminals to increase the opportunity for modal shift from road haulage to rail
 - d. where land use conflicts exist, such as availability of lorry parking and rest facilities, work with national and local partners to mitigate this through the planning and delivery of such facilities and the provision of appropriate refuelling networks as required to meet net zero carbon;

3. To ensure the Northern Powerhouse Rail programme as agreed by TfN and DfT supports the existing freight traffic and enhances capacity and capability for existing freight and freight growth. This should focus on those route sections where capacity is likely to be constrained which includes the West Coast Mainline north of Golborne, Midland Mainline through Sheffield area, East Coast mainline 2 track section via Durham and the routes across Manchester. Additionally, it should include areas of opportunity. This may require the development of alternative freight priority routes which would need to be examined closely with industry once the Northern Powerhouse Rail routes are agreed to ensure existing rights remain unaffected;
4. To undertake detailed consultation to understand the demand forecasts within the business case for the Trans Pennine Route Upgrade as outlined in the Integrated Rail Plan which includes freight gauge enhancement and that the network capacity for the forecast extra traffic is reserved;
5. To support the developing approach to decarbonising rail freight as outlined in TfN's Decarbonisation Strategy. This includes working with Network Rail, freight operating companies and train operating companies to ensure:
 - a. we understand the need for incremental electrification of freight;
 - b. influence government to fund a core network for electrification (inc. freight paths and the need to electrify node to node (e.g. into ports));
 - c. there is sufficient capacity to allow freight traffic to run directly from origin to destination and with minimum dwell times in loops and on the network, reducing emissions from existing diesel trains; and
 - d. that there is ongoing and successful development of alternative low carbon technology for freight locomotives with support from national government.
6. TfN's Decarbonisation Strategy has a key action to facilitate and develop partnerships to achieve port to port zero-carbon multimodal corridors. We aim to capitalise on two areas: firstly the freeport status of a number of our ports and the tax and customs benefits the status brings to the ports and their hinterlands, secondly, the potential to both produce and use green fuels in these locations for fuel intensive industry clusters but also for the first mile freight that flows out of and into our ports including HGVs, rail and maritime. We will liaise with industry to develop the best model for this with initial discussions with the Northern Ports and existing clean growth partnerships.
7. Underpinned by detailed analysis from the TAME activity, develop a suite of policy related interventions relating to air quality, impacts of

urban delivery on consolidation/distribution centre locations, overnight lorry parking provision, detailed understanding of road freight movements including vans, heavy and light good vehicles and Smart Motorways, micro-consolidation, green shipping options, freight efficiency and use of e-cargo bikes and future uses of infrastructure. This will support and further the Northern element of the DfT's Future of Freight work.

8. Work across the TAME and Strategy Teams at TfN with the Department for Transport in developing the Data Discovery project. This will encourage data democratisation which will lead onto increased levels of freight efficiency, reduced emissions and will enable partners to access more freight data that will strengthen and enhance business cases that include a freight and logistics element.

9. Develop plans for recommended locations for rail connected warehousing working alongside partners and their emerging timescales for Local Plans with particular recognition of any changes to the planning regime soon to be implemented;


10. Remain actively engaged in using and analysing emerging evidence of the effects of Brexit, Covid 19 and other recent economic shocks. Understand and communicate how this affects the movements of freight on an East-West and North-South basis, how demand for and access to ports changes and potential change in uses of freight terminals including distribution centres. This should then be utilised in business case development and the refreshed TfN Strategic Transport Plan.



Transport for the North
2nd Floor
4 Piccadilly Place
Manchester
M1 3BN



Transport for the North
Ground Floor
West Gate
Grace Street
Leeds
LS1 2RP

 0161 244 0888

 info@transportforthenorth.com

