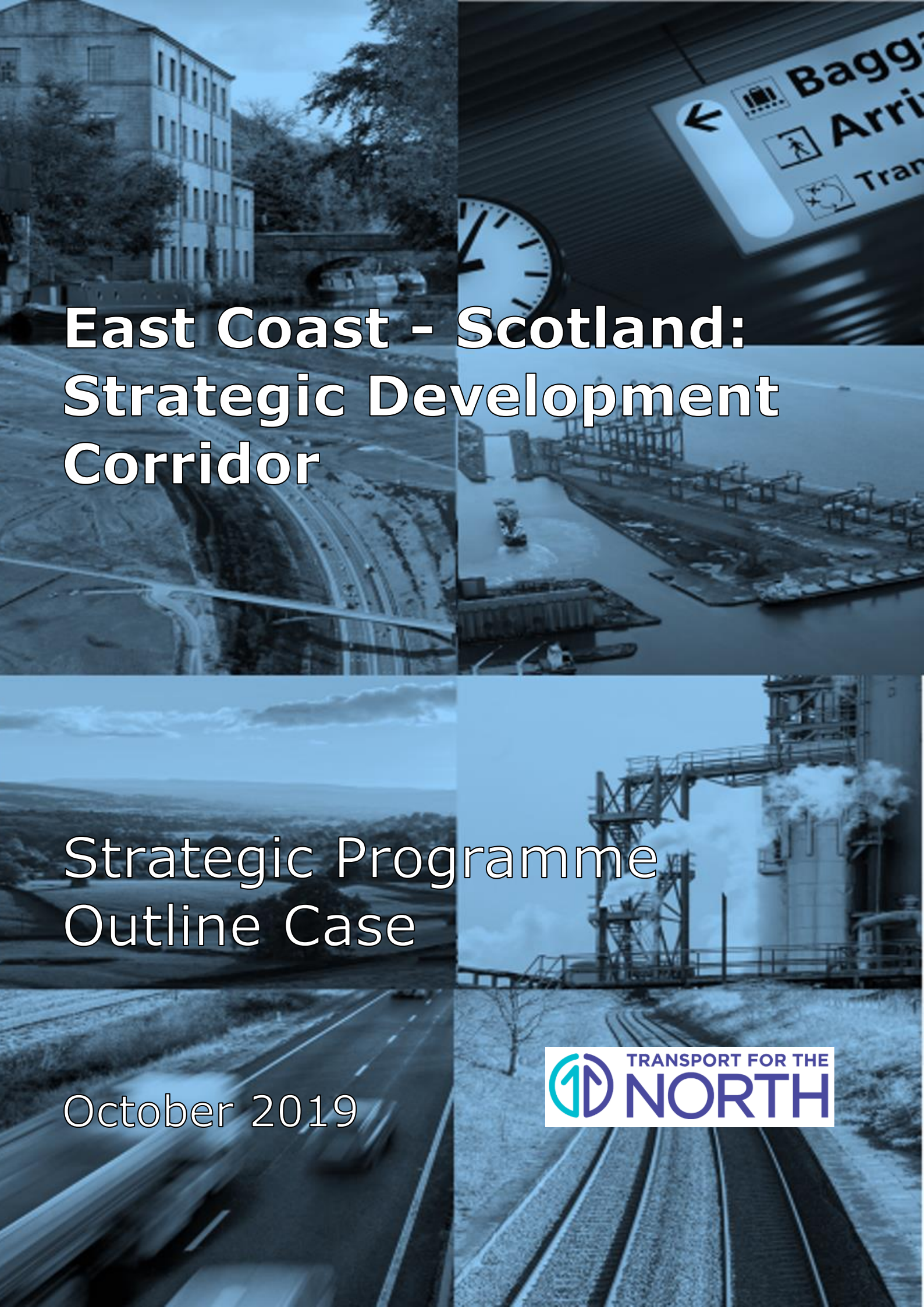

East Coast - Scotland: Strategic Development Corridor

Strategic Programme Outline Case

October 2019

TRANSPORT FOR THE NORTH

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Supporting Documents

A standalone Executive Summary has been published separately.

Further detailed evidence is available on TfN's website at: https://transportforthenorth.com/

1 Introduction

Background

1.1 The people of the North are at the heart of the Transport for the North (TfN) Strategic Transport Plan (STP)[1]. An effective, efficient Northern transport network is a fundamental part of everyday life – connecting people to jobs, health, education and leisure opportunities, connecting businesses to each other and allowing the efficient movement of goods and services. A transport system that is fit-for-purpose with strong north - south and east - west connections will be the backbone of a strong economy for the North and for the UK.

1.2 The STP has a horizon year of 2050 to align with the *Northern Powerhouse Independent Economic Review* (NPIER)[2] and to enable the development of a long-term transport investment programme for the North. This will mean that TfN and its Partners can work with Government to secure funding to deliver the right schemes in the right place at the right time, providing certainty for local transport authorities to plan complementary investment and also for the private sector to plan commercial investments. The pipeline of investment will give confidence to businesses across the North to invest and grow, give the supply chain, including Small and Medium Enterprises (SMEs), confidence to plan interventions, build up their skills base, and collaborate across industries.

1.3 Building on existing and proposed projects, the Strategic Development Corridors (SDCs) represent strategic geographical and economic areas with the strongest potential towards transformational growth in the North. Combining evidence from the 2017 Integrated Rail and Major Roads Reports, the STP identifies seven corridors (see Figure 1.1) where evidence indicates delivery of transformational growth is dependent on bringing forward major road and rail investment.

1.4 These corridors complement Northern Powerhouse Rail (NPR), Integrated and Smart Travel and three Strategic Road studies[3], which form part of the reference case for this study. This study specifically seeks to explore the East Coast Strategic Development Corridor (SDC).

Transport for the North

1.5 TfN is the voice of the North of England for transport; a statutory body of elected leaders and a partnership of business leaders from across the whole

[1] Strategic Transport Plan for the North (Final)

[2] https://transportforthenorth.com/wp-content/uploads/Northern-Powerhouse-Independent-Economic-Review-Executive-Summary.pdf

[3] Northern Trans Pennine Routes; Manchester North-West Quadrant; Trans Pennine Tunnel

of the North of England who collectively represent all of the region's 16 million citizens.

1.6 Alongside local political Leaders, TfN's Board also has representatives from the national transport bodies (Network Rail, Highways England and HS2 Ltd) and works closely with its neighbours in Wales, Scotland and the Midlands.

1.7 TfN's vision is of *"a thriving North of England where world class transport supports sustainable economic growth and improved opportunities for all"*. As England's first Sub-National Transport Body, TfN was established to transform the transport system across the North of England. It has a clear remit to plan the transport infrastructure required to support transformational economic growth in the North.

1.8 The statutory powers that have been granted allow and require TfN to:

- Develop and implement a STP for the North of England.
- Act as 'one voice' for the North, clearly communicating Pan-Northern priorities to the Secretary of State for Transport.
- Coordinate and deliver smart ticketing systems across the North.
- Become a statutory partner in rail and road investment decisions, through the Rail North Partnership and Highways North Board.
- Oversee (jointly with the Department for Transport) franchised rail services covering Northern and TransPennine Express franchises.
- Promote highways improvements of Northern significance, with the agreement of Government and relevant highway and local authorities.
- Decide on capital grants.

1.9 Complementing the work of existing local transport authorities and with powers devolved down from central government rather than up from local government, TfN's role is to add value, ensuring that funding and strategic decisions about transport in the North are informed by local knowledge, expertise and requirements.

1.10 A vision of a transformed North was set out in the NPIER. It concluded that transformational growth will require investment and improved performance in a number of critical areas, especially education, skills, innovation and inward investment, alongside improved transport infrastructure and services for passengers and freight.

1.11 The NPIER also established that a transformed North could see an additional 850,000 jobs and almost £100 billion additional Gross Value Added (GVA), over and above 'business as usual' trends, by 2050.

1.12 It is crucial that the productivity gap which currently holds back growth in the North is reduced, to ensure that all of the North performs as well as the rest of the UK. A step-change in strategic transport infrastructure investment is a vital enabler to achieve the North's economic aspirations – establishing a value-for-money investment programme, within an ambitious, but realistic, funding envelope, is TfN's primary responsibility.

Definition of Pan-Northern

1.13 TfN has gone some way to defining what is meant by the term 'Pan-Northern'. A key component of this is subsidiarity; pursuing governance and decision making at a local level, whilst accounting for the appropriate scale of organisation required to exercise powers at a regional (for example, Pan-Northern) level.

The Definition of Pan-Northern

Why? "Facilitate and enable transformational growth of the economy through improved connectivity for people, businesses and goods to, from and within the North."

How this will be achieved:

- By enhancing the North's major transport networks to operate more efficiently and more reliably and to increase network resilience
- Supporting, informing and influencing present and future land-use development
- Promoting and enhancing the built, historic and natural environment
- Supporting the reduction of transport-related carbon emissions and contributing to improvement of air quality
- Ensuring proposed transport interventions offer value for money
- Improving journey time, quality and choice

1.14 It flows from this principle that TfN is the appropriate level at which to take transport decisions impacting across geographies in the North, whilst local authorities are the appropriate level at which to take transport decisions that are contained within a locality in the North and where investment is not necessarily driven by Pan-Northern aspirations. 'Pan-Northern' is a short-hand, encompassing, definition which refers to transport interventions that naturally fit within TfN's remit.

The rationale for Strategic Development Corridors

1.15 TfN has identified seven Strategic Development Corridors (SDCs) to represent where the largest gaps between demand and performance currently exist, and where there is likely to be the greatest economic potential to improve connectivity and the economic interaction of Important Economic Centres and growth clusters within the north of England.

1.16 Investment considered within the context of these corridors is focused on interventions that will benefit the whole of the North. This process acknowledges the possibility that locations of demand and investment priorities may change over time with land use decisions and market responses, which will be informed by future iterations of TfN's Strategic Transport Plan (STP). The remit of the SDCs does not consider interventions with a predominantly local impact but TfN will work with its Local Authority members to ensure integrated planning with local networks.

1.17 The Yorkshire - Scotland SDC (Road only) and the East Coast – Scotland SDC (Rail only) have been merged to be a multi-modal SDC SPOC known as

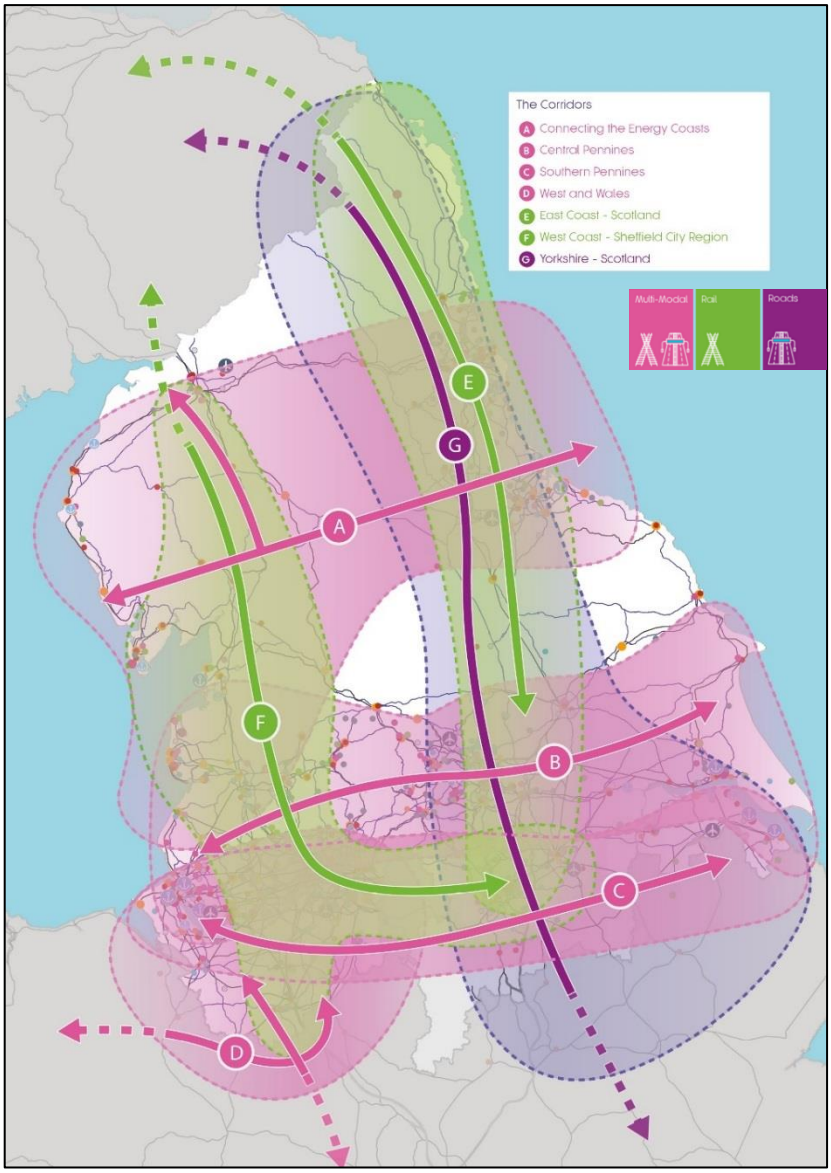
'East Coast – Scotland SDC'. This merged SDC corridor, alongside the West Coast – Sheffield City Region SDC, will complete the geographic areas that are identified within Figure 1.1 below, and will augment the four SDCs that were progressed during 2018 and completed concurrently with the TfN STP and Investment Programme that was published in March 2019:

- Central Pennines
- Southern Pennines
- Connecting the Energy Coasts
- West & Wales

1.18 The East Coast – Scotland SDC has been progressed from the Yorkshire to Scotland highway Options Assessment Report (OAR) work from 2018 and also considers Network Rail's East Coast Main Line Route Study from July 2018.[4]

[4] **https://cdn.networkrail.co.uk/wp-content/uploads/2017/12/East-Coast-Main-Line-Route-Study.pdf**

Figure 1.1: TfN Strategic Development Corridors



Source: TfN Strategic Transport Plan

1.19 The SDCs work to date has played a critical role in defining the later stages of the TfN Investment Programme, which identifies a sequenced list of interventions up to 2050.[5]

- Encompassing committed schemes within industry processes;
- Nationally significant infrastructure schemes such as High Speed 2; and
- TfN's Northern Powerhouse Rail Programme.

[5] Table 3 within TfN's Investment Programme details those interventions identified for before 2027 (early phase), while Table 4 details those interventions between 2027 and 2050 (later phase).

1.20 The SDCs have served to define interventions post-2027, and have been developed in a complementary fashion to maximise the benefits of the preceding interventions, known as the TfN "Reference Case". This is explained in further detail within Section 2 with respect to how it has been modelled and appraised for the East Coast – Scotland SDC.

1.21 The Rationale for the inclusion of SDC interventions within the Investment Programme is summarised below:

- Maximise/enhance the benefits of reference case schemes
- Distribute the benefits of the North's 'major transformational-infrastructure projects' for example through improving connectivity to the NPR/HS2 gateways
- Achieve early benefits of Pan-Northern transport investment through identifying potential short, medium and long-term interventions within the programme
- Fill gaps in TfN's wider programme, targeted at the corridors where the greatest potential to unlock transformational economic growth and contribute to the other key STP objectives (such as improving efficiency, inclusivity and the environment), has been identified.

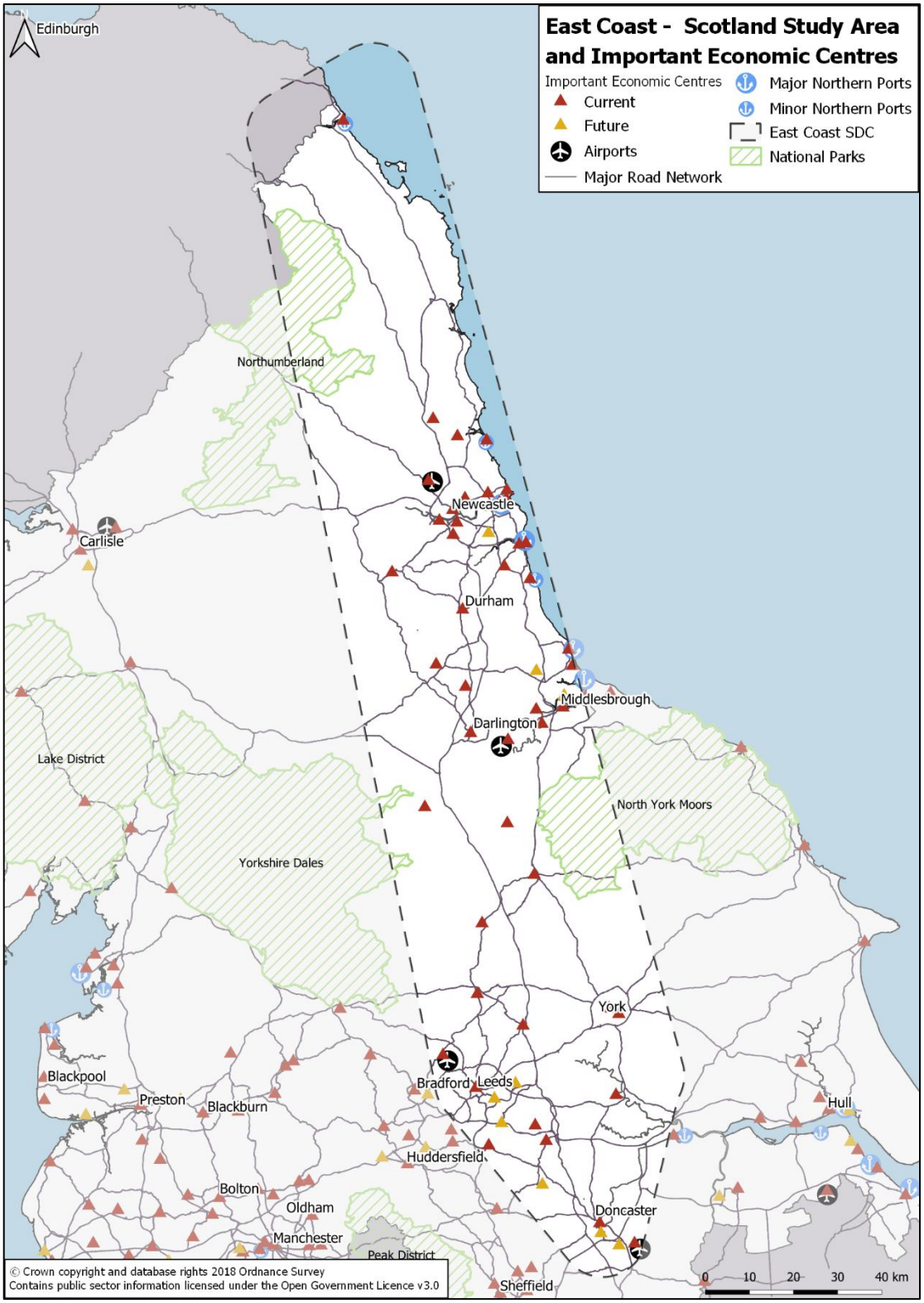
1.22 The SDCs, including technical and overall governance arrangements, have been developed and delivered by partners and stakeholders as detailed in Option Assessment Process and Management Dimension.

The East Coast to Scotland SDC

1.23 This corridor (corridor E within Figure 1.1 and shown in Figure 1.2), looks to improve the road and rail connections between Yorkshire and Scotland. It includes links to the Humber, Lincolnshire, Sheffield City Region, West Yorkshire, North Yorkshire, Teesside and North East England. From a rail perspective, this SPOC also considers the Yorkshire – Scotland SDC (corridor G in Figure 1.1). Combined, these SDCs will examine the transformational requirements to better connect the economic centres in this corridor beyond the current Road and Rail Investment Strategy commitments.

The significant economic developments in this corridor include ports (Tyne, Tees, Sunderland and the Humber), airports (Newcastle, Durham Tees Valley, Leeds Bradford and Doncaster Sheffield), major rail hubs (Newcastle, York, Leeds, Doncaster and Darlington), and intermodal freight terminals.

Figure 1.2: East Coast to Scotland SDC Study Area



Scope of Strategic Development Corridor SPOC

1.24 The TfN SDC business cases have been developed to a level of detail approaching a conventional 'single-scheme' Strategic Outline Business Case

(SOBC)[6], but greater than a Strategic Outline Programme (SOP). To distinguish them from these two documents defined in HM Treasury (HMT) and Department for Transport (DfT) guidance, they have given the description of Strategic Programme Outline Case (SPOC).

1.25 HMT public sector business case guidance[7] describes a Strategic Outline Programme (SOP) Business Case content specified to be appropriate to a programme of interventions, but at an early stage and with a relatively low level of detail, particularly in terms of Value for Money appraisal.

1.26 TfN's vision for its SDC business cases is that they demonstrate the justification for a sequenced programme of interventions within the context of the NPIER and transformational economic growth. The business case documents seek funding commitment sufficient to progress development of early sequence interventions and to further refine the overall programme.

1.27 It follows that the SDC programme of varied and wide-ranging interventions sequenced over an extended time horizon could not directly follow the above process. However, there are interdependencies and synergies between interventions within and between the SDCs which mean that the case for individual interventions would not represent its contribution to the whole package. For example, an early intervention may not deliver its full potential benefits until later interventions in the programme have been delivered.

1.28 Funding approvals for interventions within the SDC programmes will be sought through the UK public sector's staged approach to major investment decisions as shown for transport projects in Figure 1.3.

Figure 1.3: The Three Phases of the Decision Making Process

Source: DfT Transport Business Cases

1.29 Fundamental to this process is the need for procurement activity to be complete before finalisation of the Full Business Case (FBC) and all required

[6] DfT guidance uses SOBC whereas more recent Treasury guidance uses Strategic Outline Case (SOC) for the equivalent development stage for interventions with a single approval

[7] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/469317/green_book_guidance_public_sector_business_cases_2015_update.pdf (Oct 2015)

contracts entered shortly after an affirmative final investment decision. Business cases will be developed for interventions within the SDC individually or in packages of interventions sufficiently similar or related that they can be procured together.

Structure of SPOC

1.30 The TfN SPOCs have been developed with reference to the HMT Green Book[8] best practice and DfT transport analysis guidance: WebTAG. The 2018 HMT Green Book requires a public-sector business case to evidence five main 'dimensions' (previously these were known as cases). TfN's SDC SPOCs follow this convention, in being structured as follows:

- An **Introduction** comprising chapter 1
- The **Strategic Dimension** comprising chapters 2 to 7
- The **Economic Dimension** comprising chapters 8 to 15
- The **Financial Dimension** comprising chapters 16 to 18
- The **Commercial Dimension** comprising chapters 19 to 21
- The **Management Dimension** comprising chapters 22 to 29
- **Glossary**

1.31 Each of the five business case dimensions opens with an explanation of its underlying purpose, followed by the key messages from that dimension. Each of the five dimensions closes with a summary. For the Economic Dimension, the summary is provided in the form of a Value for Money (VfM) statement which follows the approach set out in DfT's VfM Framework[9] document. Each SPOC is accompanied by a standalone non-technical summary document.

Supporting Documents

1.32 Passenger rail interventions, which in many cases have impacts which are not contained within the corridor boundaries, have been represented in a separate exercise resulting in the production of an Initial Integrated Rail Report and the Passenger Rail SPOC (October 2019).

1.33 Freight within the North has been expressed in previous SDC work through reference to TfN's *Enhanced Freight and Logistics Report* (January 2018). Since the publication of the first four SPOCS, the evidence base for freight has been expanded further through *The Impact of Infrastructure of Interventions on the Freight Industry*, which has been produced by MDS Transmodal on behalf of TfN (February 2019). Both reports form the basis

8 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/685903/The_Green_Book.pdf

9 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/669041/strategic-case-supplementary-guidance.pdf (December 2017)

of freight information provided subsequently within this SPOC, and is referenced accordingly.

1.34 Further detailed evidence is available on TfN's website at:

https://transportforthenorth.com/

Strategic Dimension

The Strategic Dimension of a business case sets out to demonstrate:

- That to achieve rational aims, there are problems that need to be solved and opportunities that need to be taken (the **case for change**)
- That transport investment (including in technology solutions) is an appropriate way to deliver that change and that TfN is the appropriate promoter (the **need for intervention**)
- That an appropriately broad approach has been taken to identifying interventions and a robust approach taken to shortlisting (the **option assessment process**)
- That constraints, interdependencies and the needs/capabilities/views of stakeholders have been identified and taken into consideration in selecting a way forward (the **wider context**)

2 Introduction

Background

2.1 The Strategic Dimension sets out the robust **case for change**, which underlies the proposed programme of interventions for the East Coast Strategic Development Corridor (SDC), and how it fits with wider policy objectives. It goes on to summarise the **need for intervention**, which justifies Transport for the North (TfN) promoting strategic transport interventions, drawing this evidence together in identifying a set of **objectives** specific to the SDC.

2.2 The Strategic Dimension goes on to explain key elements of the wider context and summarises the process through which an SDC Programme, tested against different levels of demand growth, has been developed.

2.3 The Strategic Dimension has been developed with reference to HM Treasury (HMT)[10] and Department for Transport (DfT)[11] business case guidance. It

10 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/685903/The_Green_Book.pdf

11 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/85930/dft-transport-business-case.pdf

has drawn on DfT Supplementary Strategic Case Guidance, with respect to its *Transport Investment Strategy*[12] and Rebalancing Toolkit[13].

Policy Context

2.4 The UK Government, as well as regional and local authorities, have identified the need for investing in strategic infrastructure to improve the country's productivity and increase economic growth and overall wellbeing in a way that is socially and environmentally responsible. In addition, the need for rebalancing the economy and shifting away from targeting purely 'net national' impacts has become increasingly important.

2.5 TfN needs to create an economy that works for everyone and every region has been highlighted in several national, regional and local policies. Infrastructure projects and changes delivered to stimulate the economic development of the East Coast – Scotland SDC needs to consider these policies to ensure consistency with the wider national framework and other infrastructure initiatives.

Regional Policy

2.6 At the regional level, the aspiration of improving the country's productivity and economic development through improved transport links is emphasised in different policy documents. The *Strategic Transport Plan (STP)*[14] published by TfN in 2018 has a clear vision of "connecting and growing the economy of the North of England". This vision is supported by key Pan-Northern transport objectives:

12 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/669041/strategic-case-supplementary-guidance.pdf (December 2017)

13 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/669043/supplementary-guidance-rebalancing-toolkit.pdf (December 2017)

14 Transport for the North, *Strategic Transport Plan* (2018) https://transportforthenorth.com/wp-content/uploads/TfN-Strategic-Plan_draft_lr.pdf

Figure 2.1: TfN's Key Pan-Northern Objectives

2.7 The STP identifies seven SDCs (based on the 2017 Integrated Rail and Major Roads Reports), including the East Coast – Scotland SDC, as shown in Chapter 1. These corridors are representative of where evidence indicates delivery of transformational growth is dependent on bringing forward major road and rail investment.

2.8 Through the Northern Powerhouse Independent Economic Review (NPIER), transport investment has been shown to be a key enabler for growth in the North's economy. In short, transport has three main roles that can help support the North's existing and future economic assets and clusters:

- Connecting people - improving access to work opportunities, giving businesses access to a wider labour market, and improving access to leisure and tourism assets.
- Connecting businesses - improving connections to collaborators, clients and competitors, including those within the prime and enabling capabilities.
- Moving goods - supporting businesses to move freight and goods in efficient, multi-modal ways.

2.9 Collectively, these three roles provide the key aims of the STP for the North, and will be achieved through improved:

- Connectivity between the North's economic assets and clusters;
- Multi-modal connectivity improvements;
- Delivering nationally significant infrastructure projects, major employment and major local development approvals;
- Cross-border connectivity with the North's economic neighbours; and
- Supporting the international connectivity of the North.

2.10 The STP is closely aligned with the "*One North*" report published in 2014[15], which first set out the vision for a Northern Powerhouse. One North highlights the need for a new strategic approach to connect the cities of the North to support improvements in economic performance. The outlined approach emphasises the necessity for improving connectivity to maximise economic growth in the North. The STP envisions a highly interconnected and integrated region of thriving cities, acting as a valuable counterweight and complement to London.

2.11 The need for better connectivity and closer collaboration in the North is also demonstrated by the NPIER[16] published in 2016. The NPIER outlines the performance gap between the North and the rest of the UK with respect to productivity and identifies the lack of agglomeration, poor connectivity and transport links as key factors (among others) that hinder the economic development of the North. The NPIER concludes that improved connectivity between key settlements can help to:

- promote a higher employment rate, by improving access to centres of employment
- promote higher productivity, by improving access to markets
- increase the pool of workers available to work in higher productivity urban locations
- increase the effective scale of cities and the associated benefits of agglomeration

2.12 The NPIER set out a bold vision of economic transformation for the North that will rebalance the UK economy and increase international competitiveness. It articulates the vision of a transformed North and concluded that improving economic performance in the North could bring significant benefits for the UK economy by 2050 of:

- £92 billion (15%) increase in Gross Value Added (GVA) (the measure of the value of goods and services produced in an area, industry or sector of an economy)
- 850,000 additional jobs
- 4% higher productivity than in a business as usual scenario.

2.13 This uneven development between different regions within the UK and the need for rebalancing the UK economy is also the focus of the 'Rebalancing Toolkit' developed by the DfT[17]. This toolkit is designed to help authors of

[15]Transport for the North, *The Northern Powerhouse: One Agenda, One Economy, One North* (2015) https://www.transportforthenorth.com/wp-content/uploads/A-report-on-the-Northern-Transport-Strategy-1.pdf

[16] Transport for the North, *The Northern Powerhouse Independent Economic Review* (2016) https://transportforthenorth.com/wp-content/uploads/Northern-Powerhouse-Independent-Economic-Review-Executive-Summary.pdf

[17] Department for Transport, *Strategic Case Supplementary Guidance Rebalancing Toolkit* (2017)

strategic cases assess how a project fits with the objective of spreading growth across the whole country.

2.14 The evidence base on the visitor economy and transport demand in the North of England acknowledges that there are positive impacts the visitor economy can have on improving inward investment levels, owing to the increased "attractiveness of place'' and that transport connectivity plays a key role since "*the visitor economy both provides demand on the transport network and the provision of the transport network enables growth of the destinations*"[18]. If supported by the right infrastructure and increasing the ease of connectivity, this will drive an increased demand for services in the North and the airports and ports could make an increased material contribution to international connectivity[19].

National Policy

2.15 At a national level, the Government's Industrial and Transport Investment strategies outline the need to actively support the UK's long-term productivity and economic development through strategic infrastructure projects and investments[20,21].

2.16 The *Industrial Strategy* sets the overall objective of creating an economy that boosts productivity and earning power throughout the entire UK. It identifies five main foundations of productivity:

- Ideas – 'the world's most innovative economy'
- People – 'good jobs and greater earning power for all'
- Infrastructure – 'a major upgrade to the UK's infrastructure'
- Business Environment – 'the best places to start and grow a business'
- Places – 'prosperous communities across the UK'

2.17 Improved infrastructure plays a key role in the Industrial Strategy, as the need for better connectivity to link up people and markets to attract investment has been highlighted. To stimulate more inclusive economic

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https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/669043/supplementary-guidance-rebalancing-toolkit.pdf

[18]Transport for the North, Strategic Transport Plan Evidence Base, *Visitor Economy and Transport Demand in the North of England – Analysis undertaken by Merseytravel (2019)* https://transportforthenorth.com/wp-content/uploads/Visitor-Economy-and-Transport-Demand-in-the-North-Analysis-min.pdf

[19] Transport for the North, *Independent International Connectivity Commission Report (2017),* https://transportforthenorth.com/wp-content/uploads/International-Connectivity-Report_websafe.pdf

[20] HM Government, *UK Industrial Strategy* https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/664563/industrial-strategy-white-paper-web-ready-version.pdf

[21] Department for Transport, *Transport Investment Strategy* (2017) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/624990/transport-investment-strategy-web.pdf

growth through transport investments, the strategy also takes greater account of regional imbalances to ensure that growth can be achieved across all regions in the UK.

2.18 DfT's *Transport Investment Strategy*[22] is closely aligned with the Industrial Strategy. The key objectives of the Transport Investment Strategy are shown in Table 2.1.

Table 2.1: DfT's Transport Investment Strategy Objectives

Objective	Challenge
Create a more reliable, less congested, and better-connected transport network that works for the users who rely on it	Current transport networks have become increasingly out-of-date and experience increasing demand, causing delays and less reliability. In many places the transport network does not provide the connections people and businesses need.
Build a stronger, more balanced economy by enhancing productivity and responding to local growth priorities	UK productivity lags behind other developed countries and prosperity and benefits haven't been shared evenly between different regions, leaving some communities being left behind.
Enhance the global competitiveness by making Britain a more attractive place to trade and invest	The long-term success in a globalised world will depend on the UK's ability to attract job creating investment, enhance the country's industrial strengths and enhance global trade.
Support the creation of new housing	Transport infrastructure is considered as one of the keys to unlocking development and delivering places people want to live.

2.19 The necessity for improved transport links is also highlighted in the '*Making our Economy Work for Everyone'* report by the Inclusive Growth Commission[23]. This report outlines that connecting people to economic assets and opportunities needs to be a key priority to enable inclusive economic growth. The report also states that investment in social infrastructure is required indicating the necessity for building transport and economic connectivity for regions and places which were previously disadvantaged due to poor transport links.

[22] Department for Transport, *Transport Investment Strategy* (2017) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/624990/transport-investment-strategy-web.pdf

[23] Inclusive Growth Commission, *Making our Economy Work for Everyone* (2017) https://www.thersa.org/globalassets/pdfs/reports/rsa_inclusive-growth-commission-final-report-march-2017.pdf

2.20 The DfT's Local Transport White Paper: *Creating Growth, Cutting Carbon: Making Sustainable Transport Happen*[24] vision is "…for a transport system that is an engine for economic growth, but one that is also greener and safer and improves quality of life in our communities". The key objectives identified by the White Paper are to encourage economic growth, reduce carbon emissions and encourage the wider objectives of transport (such as more physical activity, improved road safety and air quality). Similar references to socially and environmentally responsible economic growth are included in the UK Industrial Strategy. Guidance from *'The Clean Growth Strategy'*[25] (Department for Business, Energy and Industrial Strategy) acknowledges that it is essential to reduce emissions with the lowest possible net cost to UK businesses and maximise the social and economic benefits arising from the change. This is envisaged by accelerating clean growth, improving energy productivity for businesses, promoting the shift to low carbon transport and using innovation in low carbon transport technology and fuels.

2.21 The Ministry of Housing, Communities and Local Government's 2018 draft *National Planning and Policy Framework*[26] sets out the need for sustainable development that has three overarching objectives: economic, social and environmental. The framework identifies the need for significant weight to be placed on supporting economic growth and productivity but states that opportunities should be taken to secure net gains across the three objectives.

East Coast – Scotland SDC Specific Policy

2.22 Within the regional areas of the East Coast - Scotland study area, several strategies and policy documents in the form of Local Transport Plans and Transport Strategies, support the overall goals of improving transport infrastructure, social wellbeing and economic growth.

2.23 The Northumberland Local Transport Plan[27] highlights the need to support economic growth whilst also addressing challenges in accessing public

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[24] DfT *Local Transport White paper: Creating Growth, Cutting Carbon: Making Sustainable Transport Happen* (2011) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/3890/making-sustainable-local-transport-happen-whitepaper.pdf

[25] Ministry for Business, Energy and Industrial Strategy, *The Clean Growth Strategy: Leading the way to a low carbon future (2017) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/700496/clean-growth-strategy-correction-april-2018.pdf*

[26] Ministry of Housing, Communities and Local Government, *draft National Planning and Policy Framework* (2018) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/685289/Draft_revised_National_Planning_Policy_Framework.pdf

[27] Northumberland County Council*, Local Transport Plan 2011 – 2026* (2011), **https://www.northumberland.gov.uk/NorthumberlandCountyCouncil/media/Road**

transport, but also protecting the natural environment. Similarly, to the Yorkshire Dales National Park Local Plan, location of future developments is key. An objective for Northumberland includes providing quality housing which is also within good access to services and sustainable travel options. Tourism contributes vast amounts to the economy within these areas, by increasing the need to provide and promote sustainable travel for tourism, this will reduce the impact on the local road network from private car use.

2.24 Objectives highlighted by the Transport Strategy for North Tyneside[28] and the North East Local Enterprise Partnership: The North East Strategic Economic Plan[29], which covers County Durham, Gateshead, Newcastle, North Tyneside, South Tyneside, Northumberland and Sunderland have been reviewed. These documents highlight key targets needed to support economic development, regeneration and growth for these areas. By delivering 100,000 jobs (in which 60% of these jobs are more productive), through providing better skilled jobs and more opportunities for people within these areas will increase the productivity of the area. This in turn is aimed to be achieved through improved connectivity and effective movement for businesses, goods and people to support the region. Funding for this will be contributed through the North East Growth Deal, which provides £270m of Government funding allocated to achieve these key targets.

2.25 As of 2018, The North East Combined Authority (NECA) is one of twelve shortlisted city regions able to bid for a share of £1.28 billion over a five-year period of the Transforming Cities Fund (TCF), contributing towards improved and sustainable transport links, improved infrastructure and access to jobs. This city region includes areas such as Newcastle, Durham and Sunderland[30]. Current funding is subject to TCF Tranche 2, the submission of a final Strategic Outlined Business Case (SOBC), to be submitted by November 2019 and agreed by 2019/2020. Under DfT guidance, funding will be rewarded to proposals where the best value for money is demonstrated. For the NECA, proposals under submission of Tranche 2 include a £430 million investment and delivery by 2023 towards public and sustainable transport, focusing on improved frequency and reliability of the Metro service and the introduction of new passenger rail

s-streets-and-transport/transport%20policy/Local%20Transport%20Plan/Local-Transport-Plan-2011-2026.pdf

[28] North Tyneside Council, *The Transport Strategy for North Tyneside 2017 – 2032* (2018), **https://my.northtyneside.gov.uk/sites/default/files/web-page-related-files/North%20Tyneside%20Transport%20Strategy.pdf**

[29] North East Local Enterprise Partnership, *The North East Strategic Economic Plan 2017 – 2024* (2019), **https://www.nelep.co.uk/wp-content/uploads/2019/03/nel404-sep-refresh-2018-web-new-final.pdf**

[30] In November 2018, the North of Tyne Combined Authority was created, which encompasses Newcastle, North Tyneside and Northumberland. Since then, the North East Joint Transport Committee is responsible for public transport policy in both the North of Tyne Combined Authority and the North East Combined Authority.

services in South East Northumberland. Also proposed in the SOBC include improved Park and Ride facilities and extensions of the current cycling network to promote sustainable travel and improve connectivity for the region whilst also reducing carbon emissions.

2.26 In supporting and sustaining economic growth, the Tyne and Wear LTP3 Strategy Executive Summary[31], alongside the Core Strategy and Urban Core Plan for Gateshead and Newcastle upon Tyne[32], identifies objectives covering efficiency and reliability of integrated transport networks across all modes of transport, to support economic development, regeneration and overall competitiveness for the area. In addition, by promoting a strong network of district and local centres as well as expanding the urban core, will improve further economic activity from tourists and residents within the area, resulting in increased economic growth. Another objective of providing economic growth and sustainability will be achieved through creating a fairer environment, where access to opportunities to reach full potentials of individuals within the area are done so through access to employment, training, services and facilities. Improving the skills of people within the area and promoting local businesses, as well as attracting further business, will add to economic growth for the area.

2.27 The Tees Valley Combined Authority's Draft Strategic Transport Plan[33] up to 2029 (published for consultation during September 2019) includes several strategies from five partnering authorities as part of the Tees Valley Combined Authority including Darlington, Hartlepool, Middlesbrough, Redcar & Cleveland and Stockton-on-Tees. The document sets out measures on a local level to drive economic growth and create more jobs within these areas contributing to the region. The draft document outlines that strategies to be implemented include; the Tees Valley Road Strategy, Freight Strategy, Rail Strategy, Bus Strategy and Walking & Cycling Strategy which will outline network improvements to support priorities such as employment growth, sustainable transport measures and health and well-being.

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[31] Tyne and Wear Integrated Transport Authority, *Tyne and Wear Local Transport Plan 3 Strategy 2011 – 2021 (2011)* **http://www.tyneandwearltp.gov.uk/wp-content/uploads/2011/04/TW-LTP3-Strategy-Mar-2011-for-upload.pdf**

[32] Newcastle and Gateshead Council, *Core Strategy and Urban Core Plan for Gateshead and Newcastle upon Tyne 2010 – 2030* (2015), **https://www.gateshead.gov.uk/media/7765/Core-Strategy-and-Urban-Core-Plan-for-Gateshead-and-Newcastle/pdf/Core-Strategy-and-Urban-Core-Plan-for-Gateshead-and-Newcastle_SMALLER.pdf?m=636619103092500000**

[33] Tees Valley Combined Authority, *Strategic Transport Plan up to 2026 (yet to be published)* **https://teesvalley-ca.gov.uk/transport/strategic-transport-plans/**

2.28 The Tees Valley Strategic Economic Plan (SEP) forms the industrial strategy for the area from 2016 to 2026, setting out growth ambitions and priorities, and providing a framework for economic developments to accelerate the rate of economic growth overall. The document identifies key factors to unlocking future growth opportunities required such as better connectivity, a supportive business environment and a workforce that is fit for purpose. Overall ambitions for the Tees Valley area are to be achieved through six main priorities;

- Business Growth
- Research, Development, Innovation and Energy
- Education, Employment and Skills
- Place
- Culture
- Transport and Infrastructure

2.29 By 2026 the SEP outlines delivery of an additional 25,000 jobs within the area along with an added £2.8 billion into the Tees Valley economy. By 2040, Tees Valley will contribute 10% of the total GVA target growth towards the Northern Powerhouse. This will improve economic growth, productivity, skills and support for further opportunities to residents within the area, as well as making the area an attractive place to live, work and visit. This will also lead to the retention of already established key employment sites, and the establishment of new business for the area.

2.30 The City of York Local Transport Plan Executive Summary[34] has similar objectives to the Durham City Sustainable Transport Strategy to tackling current issues within the city. As York is a historic city, one of the main challenges identified is to enhance the public streets and spaces within the city to improve the overall quality of life for residents and tourists and to reduce the impact of motorised traffic which will encourage social and economic activity. One method identified within the City of York LTP to reduce the impact of motorised traffic includes providing good quality sustainable travel alternatives with a wider choice to reduce the need for car use. This in turn will aid to encourage behavioural changes towards maximising walking, cycling and public transport usage. In terms of economic growth for the city, a main objective outlined includes making improvements to strategic links which will enhance wider connections to key residential and employment areas both internally and externally to York.

[34] City of York Council, *Local Transport Plan 2011 – 2031 (2011),* **https://www.york.gov.uk/downloads/file/3725/ltp3pdf**

2.31 In terms of supporting and sustaining economic growth, The Strategic Economic Plan for Leeds City Region[35] includes strategies and objectives covering infrastructure, business and economic growth, place and skills resulting in increased productivity. These objectives aim to be achieved through improved access along key growth corridors including upgrades for rail passengers and freight and through creating areas of growth for transport and infrastructure services for the area. Sustaining economic growth will be achieved through access for businesses to expert support and finance and through multi-modal investments, which will create jobs and allow for new investment opportunities and a resulting increase in productivity for the area. Economic support and investment will provide access for skilled workforces and employment opportunities for residents, increasing the proportion of skilled employees will result in benefits for the economy.

2.32 The Sheffield City Region Transport Strategy[36] is part of the fourth local transport plan for South Yorkshire which covers Barnsley, Doncaster, Rotherham and Sheffield. The document outlines key objectives to be met through specific policies and outcomes to attain by 2040. These objectives include supporting inclusive economic growth, creating healthy and safe streets, improvements to the quality of outdoor spaces and finally to promote, enable and adapt technologies. In terms of economic growth, the final outcomes expected by 2040 for the area include an increase in GVA by £500m and a £500m rise in productivity, through an increase in the number of economically active people residing within a 30-minute radius of key employment sites, travelling by public transport. Other outcomes include an increase in the number of rail commuters from the Leeds City Region and Greater Manchester and 70% of people living in the most deprived areas being given improved access to urban centres, university and growth areas within a 30-minute journey via public transport.

2.33 It is important to note that along the East Coast – Scotland SDC lies Areas of Natural Beauty (AONB) and national parks including the Northumberland Coast, Northumberland National Park, Yorkshire Dales and Nidderdale. The Yorkshire Dales National Park Local Plan[37] outlines objectives in delivering sustainable development to encourage spending, increase employment and

[35] Leeds City Enterprise Partnership and West Yorkshire Combined Authority, *Leeds City Region Strategic Economic Plan 2016 – 2036 (2016)* **https://www.lepnetwork.net/media/1119/leeds-city-region-sep.pdf**

[36] Sheffield City Region, *Sheffield City Region Transport Strategy 2018 – 2040 (2017)* **https://sheffieldcityregion.org.uk/wp-content/uploads/2018/01/SCR-Transport-Strategy-Consultation-Draft.pdf**

[37] Yorkshire Dales National Park Authority*, Yorkshire Dales National Park Local Plan 2015 – 2030* (2016), **https://www.yorkshiredales.org.uk/__data/assets/pdf_file/0011/857558/Yorkshire-Dales-National-Park-Local-Plan-2015-30.pdf**

maintain quality of life for residents within the area. These areas in general have residents with a good quality of life, low unemployment, high skills, low crime and better than average health, however challenges are prevalent such as the impact on the natural environment. Objectives outlined include supporting locally-sustainable development to improve these areas, allowing them to be an attractive place to work, visit and live, whilst also providing support on these developments to maintain and further enhance existing services beneficial to residents. As the proportion of elderly to young people is significantly imbalanced, another key objective is to further encourage development to support a diverse and growing economy to promote migration for young people and those of working age to live in, but that also compliments the character of the area.

2.34 The objectives highlighted from the above plans and strategies all target improving economic growth, transport infrastructure, social inclusion and wellbeing of the population. By improving transport infrastructure and connections within these areas, this will aid economic growth and social health. Focusing on key areas where journey times are reduced via public transport services within urban centres and key employment sites, will not only be more sustainable but also more accessible and inclusive for people living in deprived areas, thus adding to an increase in regional economic growth.

The Reference Case

2.35 The Government is already funding a significant programme of transport interventions across the North. In addition, further investment is being planned by both central Government and local bodies. This includes road investment schemes put forward by Highways England, transport schemes developed by combined and local authorities across the North, Pan-Northern schemes such as NPR being developed by TfN, and HS2, led by Central Government. It also will build other improvements such as new trains being introduced by LNER and Transpennine Express and other operators together with upgraded infrastructure. In the longer term, the UK and Scottish Governments are considering the potential of cross-border high speed rail including the potential for new alignments bypassing congested sections of both the East and West corridors to Scotland. TfN will work with Transport Scotland during this feasibility work as it has benefits and impacts on NPR services and stations for example and thus any evidence developed will be considered towards future TfN programmes and iterations of TfN's Investment Programme.

2.36 Figure 2.2 illustrates the HS2 (Phases 1, 2a and 2b) and the Northern Powerhouse Rail (NPR) reference case. Combined, these will transform journey times and service frequencies between the North's largest cities and to London, Birmingham and the Midlands. It is therefore expected that significant investment in new transport infrastructure will be delivered in the coming decades to address connectivity challenges of the current transport system.

Figure 2.2: Emerging vision for the Northern Powerhouse Rail Network

Source: TfN Strategic Transport Plan

2.37 In this context, a Reference Case, considered to be a 'do-minimum' scenario, has been developed by TfN which includes both committed schemes and non-committed strategic interventions that can be reasonably expected to be delivered in the medium and long term and are necessary to achieve the North's economic growth aspirations.

2.38 For the purposes of this study, the Transport Appraisal Guidance (WebTAG) definition of reasonably foreseeable has been extended for the SDCs to include any strategic intervention that is at Strategic Outline Business Case (SOBC) stage or equivalent, including interventions without an identified funding route. Post 2027 the reference case includes other work programmes identified by the STP as necessary to achieve the North's economic growth aspirations. Table 2.2 sets out the key reference case

parameters and assumptions. The strategic interventions featured within the SDC Reference Case are consistent across all SDC studies.

2.39 For a full list of interventions covered by the reference case for the East Coast – Scotland SDC, see Table 2.3.

Table 2.2: Reference case parameters and assumptions

2020-2027	Post 2027
STP 'baseline investment assumptions' will be included in the Reference Case (already been confirmed by Highways England, Network Rail and DfT as committed).	Reference Case includes other work programmes identified by the STP as necessary to achieve the North's economic growth aspirations; HS2, NPR, Northern Trans-Pennine Routes, Trans Pennine Tunnel & Wider Transport Connectivity Assessment and Manchester North-West Quadrant.
Interventions identified by the SDC consultants and TfN as being 'reasonably foreseeable'.	Reference Case should be developed to ensure a 'do-minimum' standard within the transport model is represented.
WebTAG definition of reasonably foreseeable has been extended for the SDCs to include any strategic intervention that is at SOBC stage or equivalent, including those without an identified funding route.	
Expect to include interventions within Highways England's Road Investment Strategy and Network Rail's Enhancements Delivery Plan	

Table 2.3: Reference Case: List of interventions (Road/Rail)

Road	Rail
• M18 J3 improvement • A1 Redhouse to Darrington • A1 Doncaster Bypass • A630 Parkway widening and M1 J33 improvements • A61 Dualling between A616 and M1 J36 • Warmsworth Dualling • M621 J1-7 Improvements • East Leeds Orbital Route • M1 Junction 45 Improvement & Temple Green Park-and-Ride • M1/ M62 Lofthouse Interchange • Aire Valley Expansion • M62 junction 27 • M62 junction 28 • A66 Darlington Northern Link Road • Cargo Fleet Roundabout Capacity Improvements • A1(M) J59 Junction Capacity Improvements • A171 Swans Corner to Flatts Lane Improvement • A19 Norton to Wynyard • Darlington Growth and Enterprise Zone Connectivity • New Tees Crossing: Viaduct Option • A1 Leeming to Barton improvement • A66 Scotch Corner to Greta Bridge Dualling • A1237 York Northern Outer Ring Road Roundabout Improvements • A1(M) / A59 Junction 47 Improvement • A1237/ A64 Hopgrove Junction Improvement and A64 Dualling (Hopgrove to Barton • A1079 Roundabout Improvements at Killingwoldgraves & Shiptonthorpe • A164 & A164/ A1079 Jocks Lodge Junction Improvement Scheme • A63 Castle Street • A63 Garrison Road Roundabout • A19 junction and on-line improvements between Killingworth interchange and Coast Road/Silverlink • Ponteland Road corridor • Holborn Strategic Transport Improvements • Doxford Park Ryhope Link Road South / Sunderland Growth Area Access Route • Local Junction Improvements to Support Great Park and Outer West developments • A19/A179 Sheraton • Aire Valley Expansion	• HS2 Phases 1,2a and 2b including all station works to accommodate services; • Northern Powerhouse Rail programme; • Transpennine Route Upgrade (including intermediate interventions); • Northern, TransPennine Express, LNER and East Midlands rail franchise commitments • Interventions at the major hubs necessary to realise the benefits of improved connectivity along the NPR corridors, including in this SDC: York and the Leeds Station Masterplans • Sheffield-ECML electrification (GRIP 3); • W12 gauge clearance between Port of Immingham and Doncaster; • East Coast Main Line power supply upgrade; • Horden Peterlee station; • Freight enhancements Northallerton-Eaglescliffe/ Teesport;

Road	Rail
• Stainton Way Western Extension - New distributor road linking the A1130 and the B1380 to the west • of Acklam • A19/A1130 Mandale Interchange Improvements - Partial signalisation of interchange • B1380 Low Lane/Stainton - Way Junction Improvements - Partial signalisation of existing roundabout • Stainton Way Widening and Junction Improvements • B1365 Hemlington Lane Widening/Newham Way Widening and Junction Improvements • Longlands to Ladgate Lane Link Road • A172 Dixons Bank/Stainton Way Improvements • A172/A174 Stokesley Road Interchange Improvements • A168 / B1448 scheme for the slip road at Thirsk	

2.40 The programme of interventions put forward within this Strategic Programme Outline Case (SPOC) has been developed to maximise the overall benefits of the interventions in the Reference Case and to improve the spatial distribution of benefits.

Structure of Strategic Dimension

2.41 The remainder of the Strategic Dimension of this SPOC is structured as follows:

- Chapter 3 sets out the Case for Change which is the foundation for the programme of interventions justified within this business case
- Chapter 4 outlines the Need for Intervention and identifies SDC objectives
- Chapter 5 explains the wider context with influence on the deliverability of the programme and the interventions within it
- Chapter 6 summarises the option assessment process which identified interventions within the SDC
- Chapter 0 summarises the findings of the Strategic Dimension

3 The Case for Change

Introduction

3.1 This chapter sets out the Case for Change which underlies the justification for strategic investment in the East Coast – Scotland SDC. Fundamentally, transport investment infrastructure is required to support transformational growth in the North which in turn increases the potential for national economic growth.

3.2 The Case for Change is based on identifying problems which need to be solved and opportunities which need to be taken to allow and support growth in the North's economy.

Need for growth in the North's economy

3.3 The North is home to 515,000 businesses, more than 6.8 million jobs, and over 15 million people, with population growth of 6.7% over the last 20 years.

3.4 The North has a wealth of high-profile, growing UK-wide and international businesses, and a long history of innovation, utilising the rich and diverse set of assets and talent to support national growth. Over the last decade businesses and employees across the North have generated an additional £65 billion (25%) to the UK economy. Today the North is the second most productive region in the UK in absolute terms, with a total economic contribution of over £332 billion, 19% of the UK's total.

3.5 However, while some individual economies of the city regions of the North have experienced strong economic progress, the North as a region lags behind London and the South East with respect to its economic performance. A significant and widening performance gap between the North and the rest of the UK has become evident and will continue to grow unless action is taken to reverse this trend.

3.6 Investment in transport infrastructure is required to support transformational growth in the North and subsequently increase the potential for national economic growth due to:

- **The size of the North's economy:** being the second most productive region in the UK in absolute terms demonstrates the North's importance to national productivity.
- **Poor productivity performance:** When considered on a GVA per hour worked basis the North's productivity level is 88% of the UK average. The North also performs poorly when productivity is measured on a GVA per worker or per capita basis and this productivity gap is growing.
- **A need to invest in and support the NPIER Prime and Enabling Capabilities[38];** The Capabilities are key differentiators of the North's economy on an international level, which are highly productive and capable of competing on national and international stages. Support for these capabilities is required to achieve the ambition for transformational growth.
- **Transport infrastructure's contribution to economic growth;** Transport can contribute to achieving transformational growth

[38] The prime and enabling capabilities were identified in the Northern Powerhouse Independent Economic Review (2016). They have been identified as differentiated and distinctive at a Pan-Northern level, highly productive and able to compete at national and international scales. Prime and enabling capabilities are as follows: Advanced Manufacturing, Energy, Health Innovation, Digital, Financial and Professional Services, Logistics, and Education (primarily Higher Education)

particularly through agglomeration, labour market expansion, connectivity to global markets and encouraging skills investment.

3.7 The success of the UK in the global marketplace and the success of the Government's Northern Powerhouse Strategy and Industrial Strategy depends upon transforming the economy of the North.

East Coast – Scotland SDC's contribution to the North's Economy

3.8 The SDC corridors and the STP stem from the NPIER work (June 2016) done to capture the benefits of a transformed North of England. The projections presented below comparing the 'Business as Usual' and 'transformational' scenarios represent a sustained better long-term performance for the North than has been seen in any period in the last four decades. They include a period in which the North's growth is projected to exceed that of the UK as a whole, as the benefits of the improvements in the various drivers of productivity and output growth, including transport connectivity, allow some degree of closing of the productivity gap. The projections imply a substantial restructuring of the North's economy.

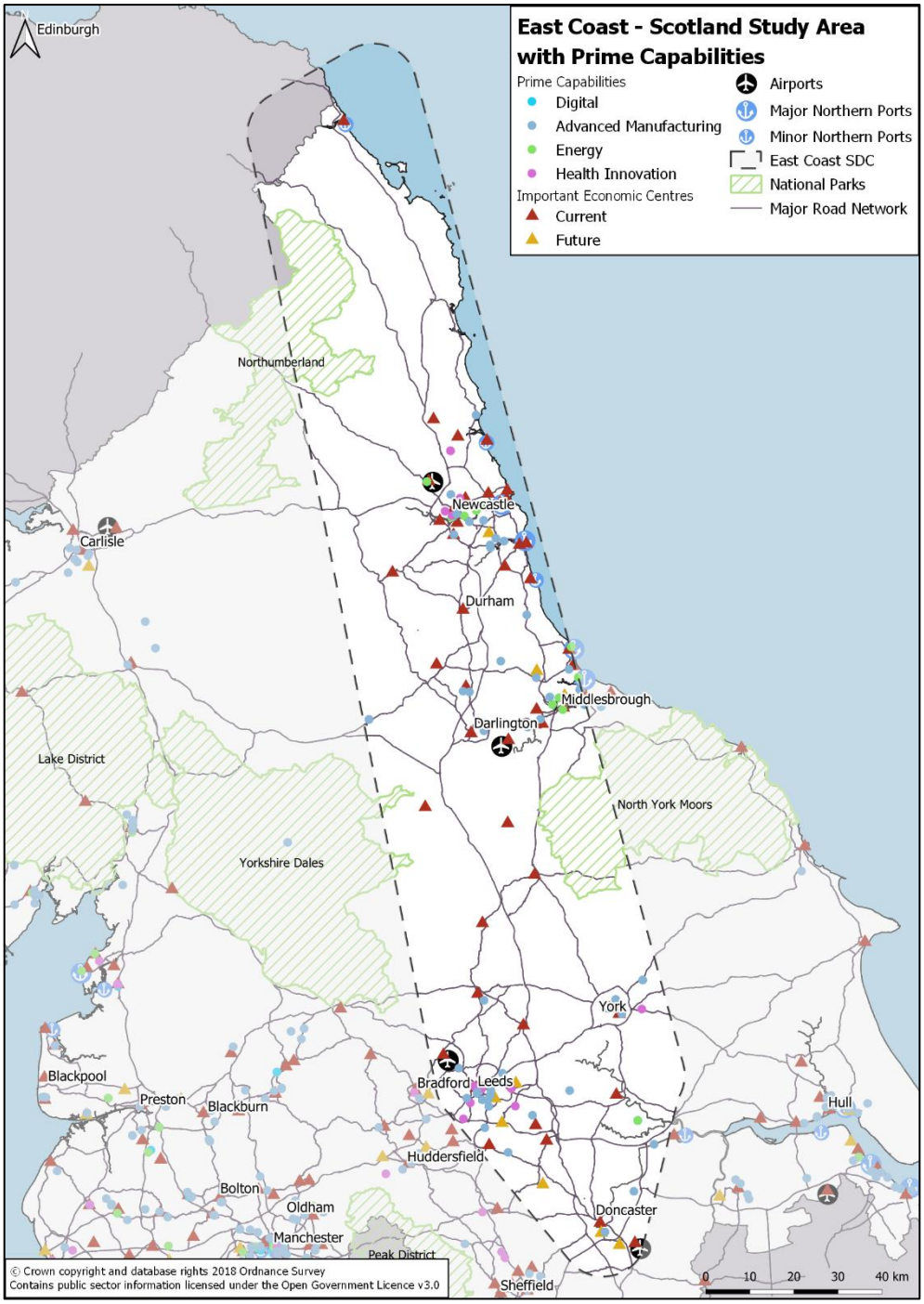
3.9 This East Coast – Scotland SDC looks to strengthen the significant economic development in this corridor.

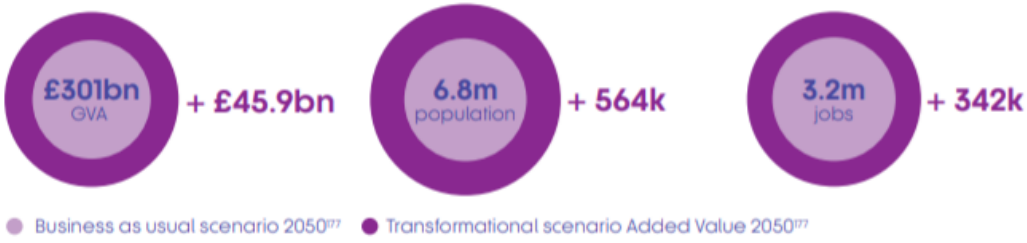
3.10 From a rail perspective, these developments include:

- major ports, including the port of Tyne, Tees and Hartlepool;
- airports including Newcastle, Durham Tees Valley, Doncaster Sheffield and Leeds Bradford;
- major rail hubs, such as Darlington, Middlesbrough, Newcastle and York; and
- strategic rail freight interchanges and intermodal terminals.

3.11 From a road perspective, this corridor looks to strengthen and complement the existing highway network whist examining the transformational requirements to better connect the economic centres in this corridor, beyond the current Road Investment Strategy commitments.

Figure 3.1: Prime Capabilities in East Coast – Scotland SDC





3.12 The IER[39] identified four areas where the North is highly skilled and globally competitive. These are called 'prime capabilities - promoting, growing and connecting the North's prime capabilities could result in higher productivity:

- Advanced manufacturing – capitalising on the North's industrial heritage and strengths in advanced materials. Manufacturing was worth £46bn in the North in 2014, over a quarter of the UK's total manufacturing output.
- Health innovation - pioneering clinical research and trials particularly in life sciences, cancer and ageing, pharmaceuticals, research and development. The North exported £7.3 billion worth of pharmaceutical products in 2015, accounting for 45% of all medicinal exports from UK.
- Energy - new technologies for energy security, production, distribution, storage, carbon capture, decommissioning and grid management. 31% of the UK's total renewable electricity was generated in the North in 2015.
- Digital - linking digital capabilities such as cognitive computation, simulation/modelling, financial technology, cyber security, high performance computing, data analytics (big data), and strengths in media. The North is home to seven of the UK's 27 key tech clusters.

3.13 The prime capabilities are supported by three 'enabling capabilities':

- Education (particularly higher education providing research capability and technical expertise for supplying skilled labour and export strengths);
- Financial & Professional Services (key business, legal, insurance and financial services); and
- Logistics.

3.14 The corridor also contains several nationally significant assets, such as the International Advanced Manufacturing Park (IAMP), in Sunderland and South Tyneside, Tees CCPP NSIP and York Potash Harbour Facilities. There is potential for future longer term investment at Hartlepool nuclear power station and major renewable energy assets at Dogger Bank and Blyth, with links to those within Hull and the Humber.

3.15 Advanced manufacturing is a particular strength with a strong automotive sector in the North East and the Tees Valley and advanced manufacturing in the Sheffield City Region. There is also a growing renewable energy sector

[39] The prime and enabling capabilities were identified in the Northern Powerhouse Independent Economic Review (2016). They have been identified as differentiated and distinctive at a Pan-Northern level, highly productive and able to compete at national and international scales. Prime and enabling capabilities are as follows: Advanced Manufacturing, Energy, Health Innovation, Digital, Financial and Professional Services, Logistics, and Education (primarily Higher Education)

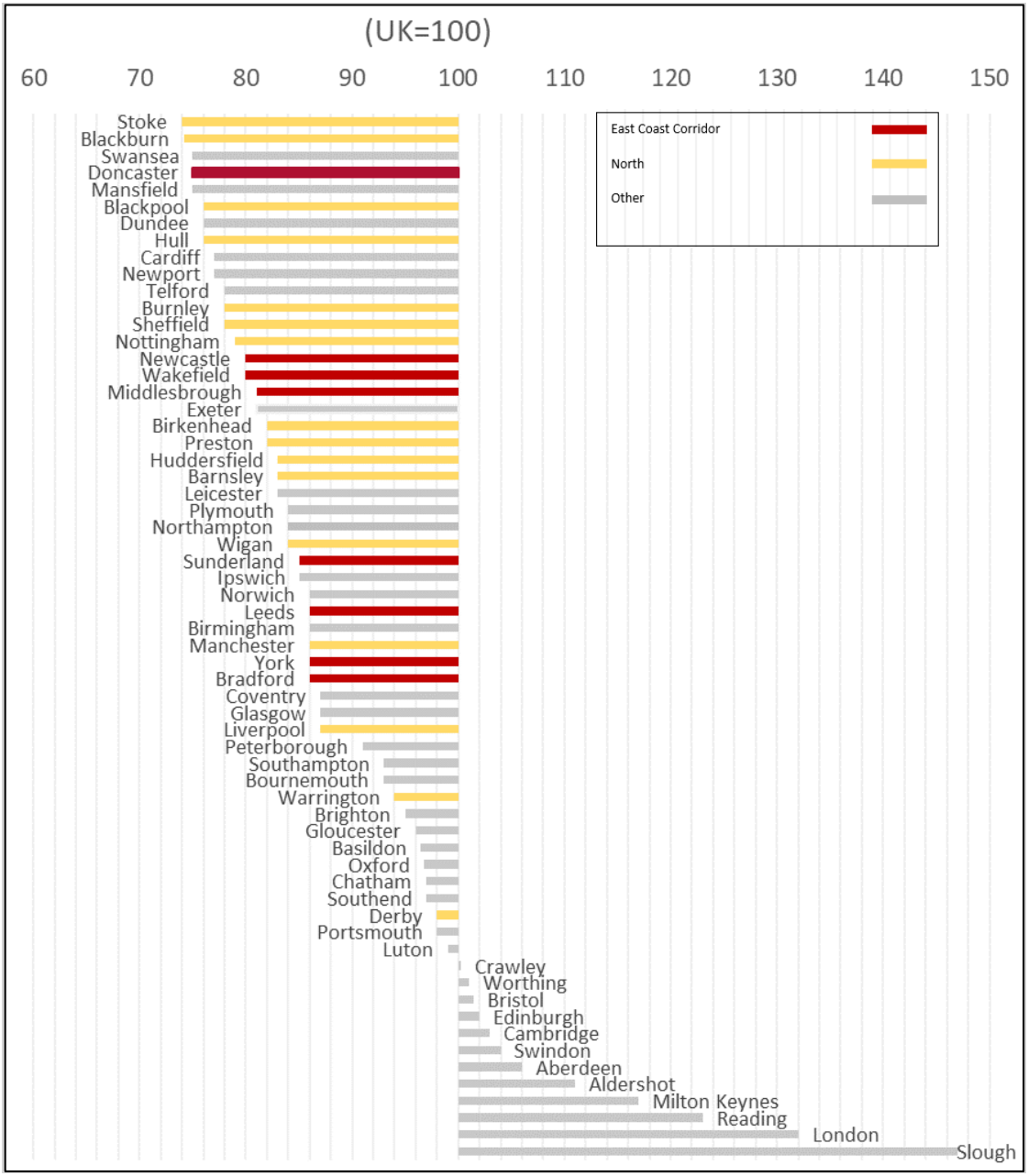
along the east coast, requiring collaboration and connectivity across the corridor.

3.16 The North East also has particular strengths in the health sector, which are complemented by emerging growth areas within the Tees Valley, and Sheffield City Region, and a strong and growing health and life science sector in the Leeds City Region. These prime capabilities are supported by strengths in the enabling capabilities including professional services (particularly in the North East and Leeds City Region) and logistics associated with the corridor's ports, airports and freight hubs.

3.17 The Independent Economic Review (IER) demonstrated that there is a gap in the North's prosperity and productivity (that is, a performance 'gap', measured by GVA per capita) that is persistent and entrenched, being consistently 25% below the rest of England average and around 10-15% below the average when London is excluded.

3.18 Considering the relative productivity of the major centres in the North of England it can be seen in Figure 3.2 that many of those that are under performing are located in the East Coast – Scotland SDC.

Figure 3.2: Relative Productivity of major centres within the East Coast - Scotland SDC, North of England and other parts of the UK (GVA per head index 2015)[40]



3.19 The consequence of this long-term imbalance is that London and the South East have become a magnet for investment, business and skilled workers. Meanwhile much of the rest of the country (including the North) lags behind, with the former industrial powerhouses of the North among the worst performers. With a higher share of people with lower skills (a problem

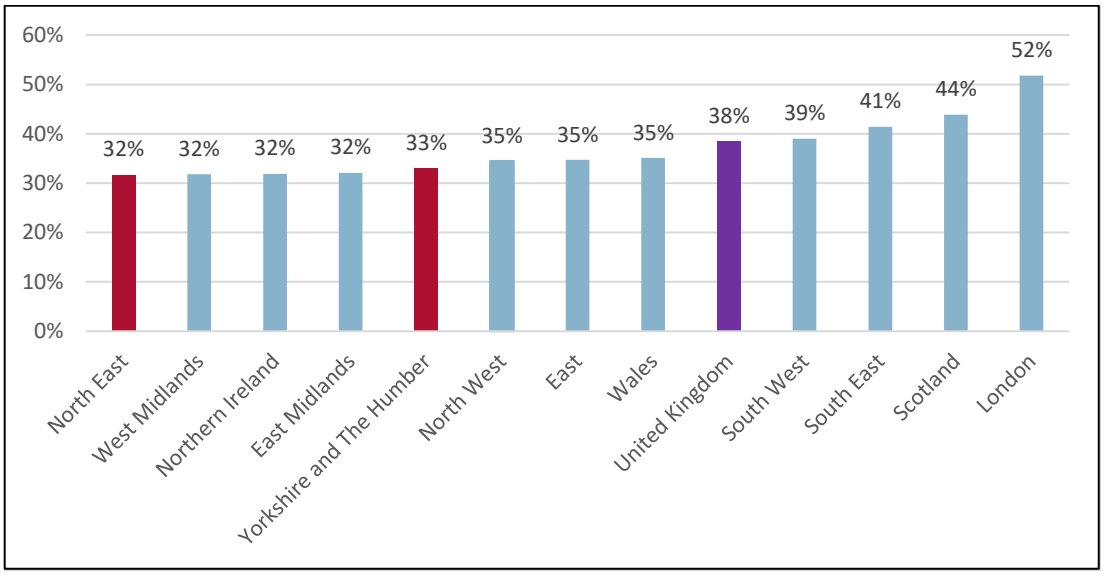
[40] Source: Author's analysis of Centre for Cities, the role of place in the UK's productivity performance, 2-17, productivity performance based on 2015 ONS data (GVA per head index) East Coast cities highlighted in red and other North of England cities highlighted in orange.

which has worsened in the post-recession period), the North has suffered from a range of inter-related issues which can also be used to indicate the significance of the performance gap in the North.

3.20 While the employment gap is likely to be the result of large numbers of people becoming detached from the labour market as they are not able to find the right job opportunities for them[41], the skills gap is likely to be the outcome of both demand and supply dimensions. From a demand perspective, low educational attainment (especially among younger cohorts) and low employment rates are the key factors contributing to a limited pool of talent that employers can access. From a supply perspective, limited job prospects and an insufficiently dynamic economy to attract and retain higher-skilled workers are critical aspects that influence the attraction and retention of talent.

3.21 This is reflected in the proportion of working age population with high levels of qualifications, shown in Figure 3.3, which is below the UK average in Yorkshire and the Humber and significantly below London, the South East and Scotland. All these factors play a key role in the development of the labour market[42].

Figure 3.3: Proportion of working age population with NVQA+ qualifications in 2017(Regions within the East Coast – Scotland SDC are highlighted red)[43]



3.22 An analysis of UK skills demand demonstrates that the North West is one of the regions with the highest numbers of job vacancies in the UK, according to analysis from the UK Visa Bureau's 'UK Shortage Occupations List' by Small Business Prices, which is in accordance with the findings of the IER. The North West has particularly high demand for financial sector jobs, directors and CEOs, nurses, social workers, mechanical engineers and

[41] Transport for the North, the Northern Powerhouse Economic Review (2016)

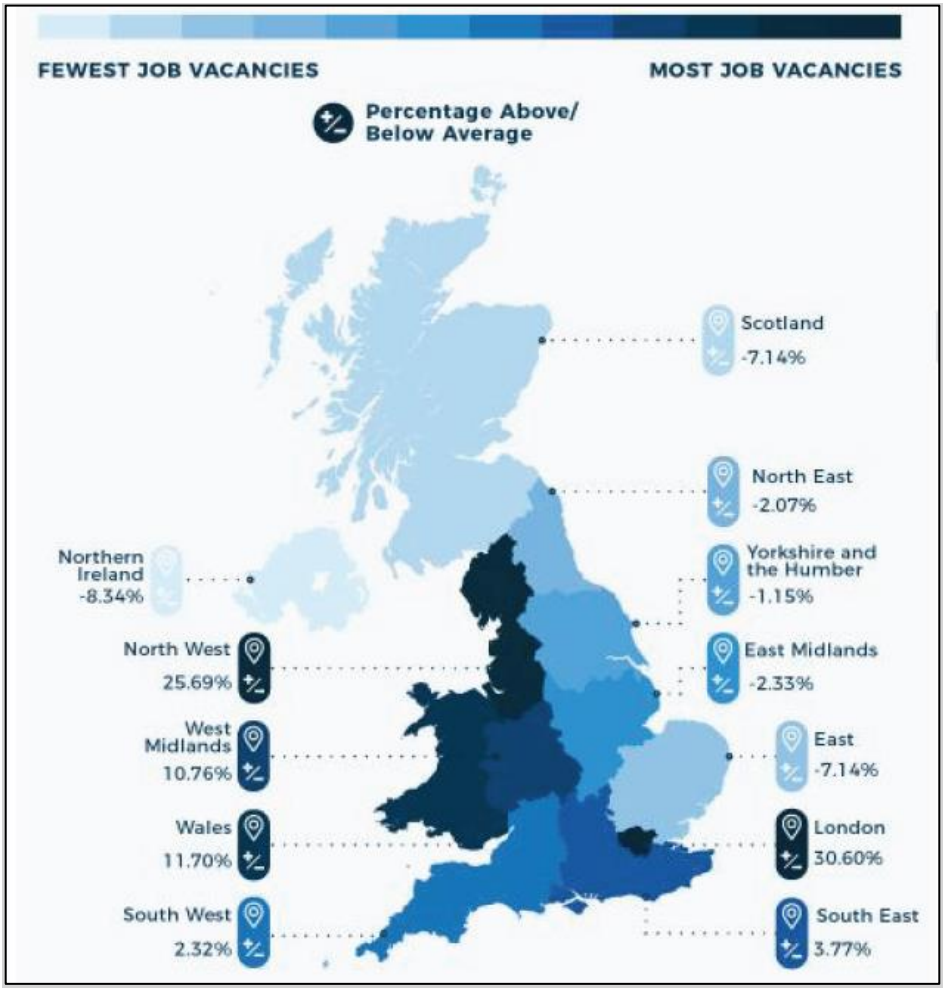
[42] Transport for the North, the Northern Powerhouse Economic Review (2016)

[43] Annual Population Survey (December 2017 data)

welding professionals. This suggests that improving access to jobs from areas with fewer vacancies (such as Yorkshire and the Humber and the North East) and attracting talent are key priority areas to improve the functioning of labour markets across the East Coast – Scotland SDC. This is a contrast to the areas of the East Coast – Scotland SDC where there are fewer job vacancies than the national average. This is most facilitated by the remoteness of these areas of the North East and North Yorkshire due to the lack of connection to the economic centres in the area.

3.23 The areas of labour demand are also shown in Figure 3.4 below, which reflects that outside of London the highest proportion of job vacancies is in the North West while the East Coast – Scotland SDC region fares poorly to the average vacancies.

Figure 3.4: Skills demand UK by region[44]

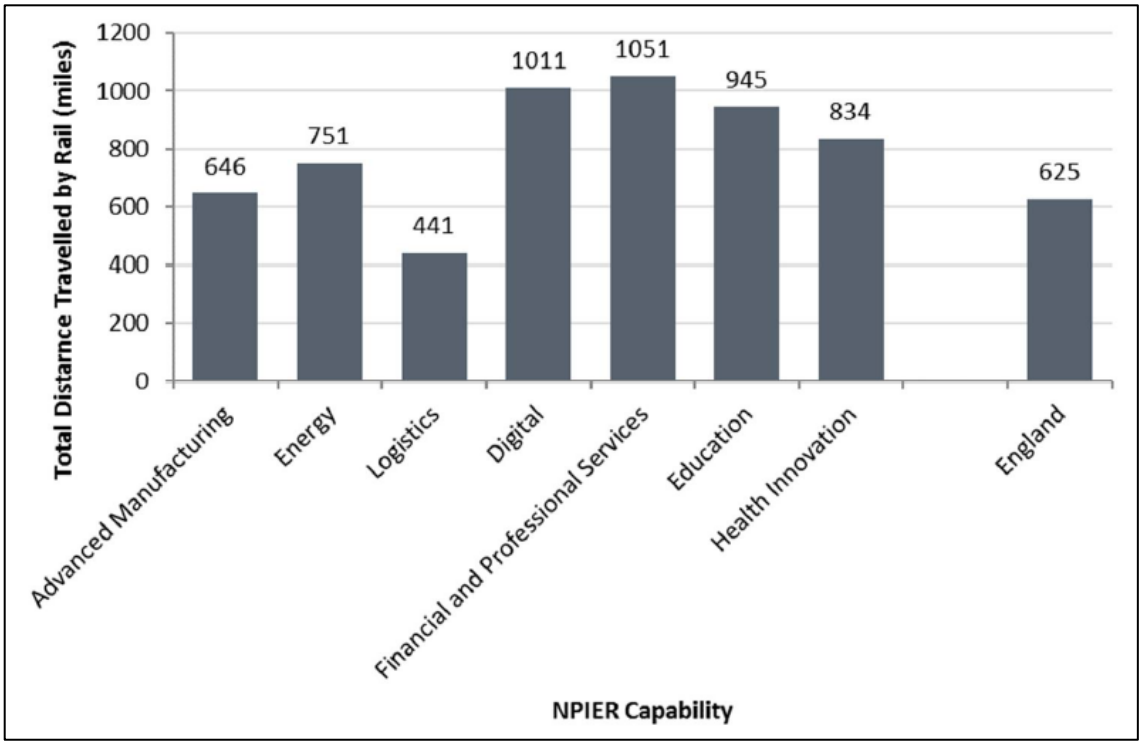


3.24 The Prime and Enabling capabilities identified in the North are the services or skills that provide the expertise and support for the North's economy to flourish, as well as significant generators of travel demand:

[44] Source: http://smallbusinessprices.co.uk/uk-skills-shortages/

- Workers within each of the seven capabilities have distinctive travel patterns, in part a result of the different geographies and occupational breakdowns within each capability, but also because of the different mix of people who work in each capability.
- Since those employed in the four prime and three enabling IER capabilities are typically more highly skilled, better qualified and in higher occupational groups, they would be expected to have a greater propensity to travel, especially by rail.
- Similar trends can be observed in terms of total distance travelled, illustrated in Figure 3.5. Workers within all IER capabilities travel greater distances than the England average, with those in the digital, financial and professional and educational capabilities travelling the greatest distances. Notably, workers within Finance and Professional Services travel 65% further by rail than the England average.

Figure 3.5: Weighted average total distance travelled by rail per person per year by NPIER Capability in England[45]



3.25 The four "Prime" capabilities and three "Enabling" capabilities, collectively represent approximately 30% of all jobs in the North and over 35% of GVA.

3.26 In a 'transformed future' scenario, the Northern economy would become more productive, partly through increasing the skills of its workforce and lowering levels of economic inactivity - both these factors are associated with an increased propensity to travel. All other things being equal,

[45] Source: Analysis of National Travel Survey (2013) and Business Register and Employment Survey (2015) data

increased productivity would therefore be expected to lead to marked changes in both the travel patterns of individuals and aggregate patterns across the entire North.

3.27 North-South connectivity across the corridor will need to be transformed in order to support the forecasted economic and population growth. Within the corridor, freight and logistics connectivity can continue to strengthen the operations and investment at the corridor's ports, airports and inland ports. Enhancing strategic connectivity to the growth plans of the airports and the Ports of the Humber and along the Tyne can have associated economic growth benefits along the corridor and the wider Northern economy. Grimsby and Immingham ports are the busiest in the UK by combined freight tonnage.

3.28 Investment in the East Coast – Scotland SDC will also need to be sensitive to environmental and sustainability considerations, particularly those affecting the Areas of Outstanding Natural Beauty, as well as identifying the visitor economy benefits and quality of life from the enhanced strategic connectivity.

Transport's influence on economic growth

3.29 Better connections at a Pan-Northern level, particularly connections between the North's existing and future economic assets, will help provide the conditions in which jobs can be created and growth achieved. To realise the benefits of agglomeration, the North requires its networks of railways, roads and also the main inland waterways, to provide effective, resilient and reliable connections. These connections should meet standards of journey time and frequency set by the North. Sufficient capacity will also be required to accommodate the increased passenger and freight travel demand that growth will bring.

3.30 The work undertaken by the NPIER highlighted that transport connectivity is a key enabler of economic growth. This is true for the North of England, as research shows that the key growth sectors cluster in its city centres. Better transport connectivity is important because:

- Investment in skills is more likely to occur where there is access to well-paid jobs and training
- Foreign investors are more likely to be attracted to locations that are well connected to global markets and which have access to a well-qualified workforce
- Firms are more likely to specialise and innovate in areas with deep and extensive labour markets
- Firms can start to cluster and agglomerate more effectively

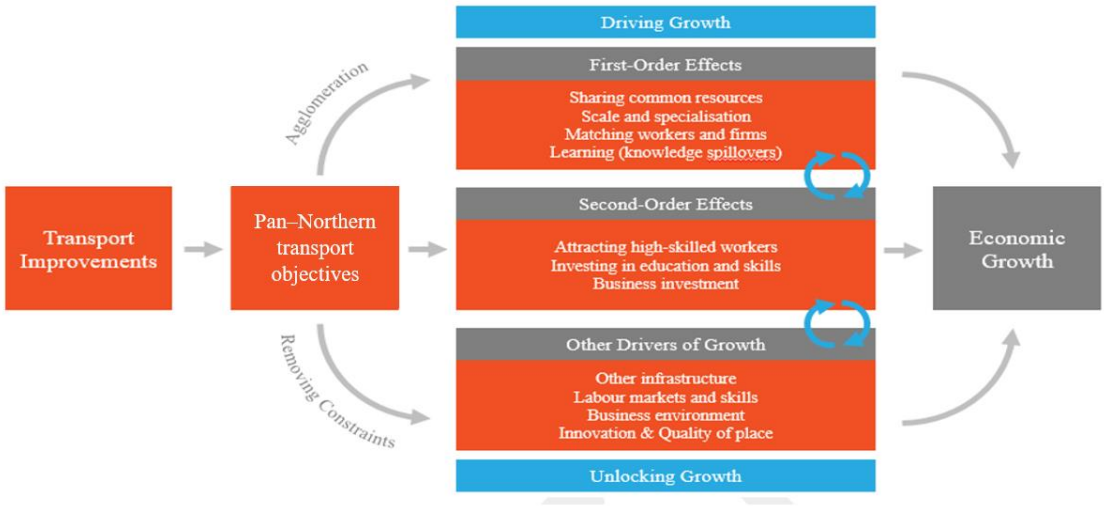
3.31 Overall, the impacts of transport are wide-ranging and can be grouped into three types: user benefits, productivity, and investment and employment

impacts[46]. A logic chain showing how investment in transport infrastructure could flow through to wider economic impacts in the North is shown as Figure 3.6.

3.32 Investment in transport benefits both rail passengers and all road users, as well as industry. The forecast growth within the NPIER shows an increase in road and rail usage. This also links to the road and rail freight moved within and out of the North. The key increases in freight flows are currently north - south routes. Additional investment in east - west connectivity would bring opportunities for more people and goods to be moved in those directions and growth in traffic through Northern ports which could see growth in containers and construction goods being moved around the North generating warehousing and processing capability. Close working with the private sector and our partners will be required to see progress made.

3.33 Improving transport connectivity in the North of England (both between and within cities) and to/from Scotland, the East Midlands and the South will support and enable growth in the key growth sectors and their high value jobs by bringing towns, cities and economic centres across the North closer together, creating the agglomeration benefits of a much larger, single economy.

Figure 3.6: Transport interventions and economic performance



Source: Adapted from frontier economics: Assessing the productivity benefits of improving inter-city connectivity in Northern England (2016), Figure 2.

3.34 Markedly improved Pan-Northern connectivity is required to facilitate the development of bigger and more agglomerated labour markets across the

[46] Anthony J. Venables et al., *Transport investment and economic performance: Implications for project appraisal* (2014) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/386126/TIEP_Report.pdf

North. Closing the transport investment gap will help to address connectivity issues, especially between cities.

Transport Baseline

Highway Network

3.35 The Major Roads Report (MRR) was produced in 2016 as part of the evidence to support the STP. As part of that process, a Major Road Network (MRN) was defined, encompassing the existing Strategic Road Network (SRN), as well as key connections between Important Economic Centres on local authority-controlled roads. It was defined with the objective of improving the performance and resilience of the network across multiple authority boundaries and was subject to rigorous consultation with partners before being ratified at TfN's Partnership Board.

3.36 Based on NPIER and current clusters of economic activity in the North, the MRN connects approximately 200 Important Economic Centres across the North, including towns, cities, ports, airports, enterprise zones, universities and other key employment sites. It is not a 'fixed network', but a network that will adapt as the North's economy itself develops and progresses ahead.

3.37 In the East Coast to Scotland corridor, the road network is at its most dense in Leeds City Region, Tees Valley, Tyne and Wear and Sheffield. The MRN plays a key role in serving long distance travel and providing last mile connectivity to the SRN.

3.38 The A1 and A19 are of strategic importance in terms of providing the only key routes for the north-south connectivity in the corridor. Other key roads on the network within this sub-corridor include the A697, A68 and A696 (each providing alternative routes between Tyne and Wear and Edinburgh) and both the A184 and A1056 which link the A1 and A19 within Tyne and Wear. The A1231 and A690 provide important strategic connections to and from the cities and Ports of Sunderland and Durham whilst supporting the SRN.

3.39 Key road-based issues include congestion, safety and accessibility issues on the A19 as well as a lack of technology to actively manage incidents, and congestion. There are AQMA issues on sections along the A1 and A1(M).

3.40 The North East is of significant importance in the context of the wider economy of the north contributing approximately £33bn in GVA to the economy in the north. In addition, the North East LEP boasts prime capability concentrations within advanced manufacturing, health innovation and digital capabilities.

3.41 There has been a long-term local political desire to provide a complete dual carriageway in Northumberland on the A1 to link Scotland and England to improve connections, reliability and safety and there are currently three schemes under development by Highways England to improve the A1 in Northumberland.

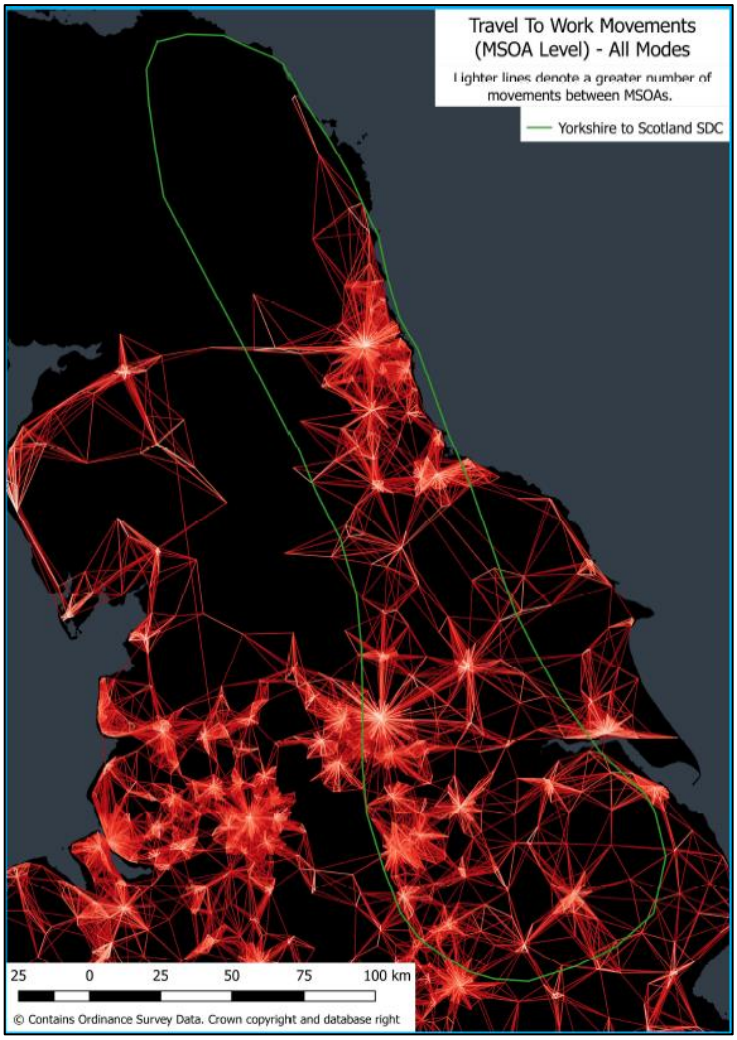
3.42 Existing congestion issues in urban areas include Durham City Centre, Harrogate Town Centre, York City Centre and ring road, Leeds City Centre and ring road. On strategic routes, congestion occurs on the A19 Tees Crossing and A66 in Tees Valley, and the SRN through Leeds. There is a lack of technology on both the A19 and A66 to assist with incident management. Access to the trans-peninne route of the A66 is via the A1 for Tees Valley / North Yorkshire and the A688 from Durham.

3.43 The Highways England A1 Leeming to Barton improvement scheme is now complete; this was previously the only section of non-motorway on the strategic M1/A1(M) route between London and Gateshead. The A19 needs to be explored in terms of whether interventions such as gap closures, expressway ideas and defined diversion routes would have any benefit in reducing frequency of accidents.

3.44 The East Coast – Scotland corridor serves to provide both a north-south (A1) and east–west (M62, M180) function. The corridor is constrained by the physical barrier of the Humber Estuary preventing more connections between North Yorkshire & East Riding to North and North East Lincolnshire where collectively there is a large agglomeration of prime capabilities.

3.45 Travel to work patterns within the East Coast – Scotland SDC area is shown in Figure 3.7, including trips by the road and rail network.

Figure 3.7: Travel to Work movements -All Modes (2011 Census Data)



3.46 Current travel patterns indicate a high level of inter-urban trips in Tyne and Wear, Tees Valley, Leeds City Region and a spinal cluster of trip activity along the M1 from Leeds to Nottingham. Hull, Grimsby and Scunthorpe display trip patterns that are interconnected within these areas, with a high level of commuters to/from Lincolnshire.

3.47 The east coast of North Yorkshire has very few commuters beyond York and the Tees Valley, although connections to Hull provide links towards Bridlington.

3.48 Within the corridor, east-west movements play an important role for commuters accessing jobs in the Humber, Lincolnshire, and the North Yorkshire Coast. York plays an important function in facilitating east west traffic at the heart of the corridor providing a commuter hub that 'spokes' to Hull, Scarborough, Harrogate and Leeds.

3.49 Within the corridor, car trips are by far the most dominant, with journeys by rail primarily focused along the East Coast Mainline and the Trans Pennine Route centred around Leeds between Liverpool, Manchester, Hull and the North East. Other key rail movements are focused in Doncaster,

Hull and Middlesbrough. As such, it is evident that there is a reliance on the road network, especially for connections between centres.

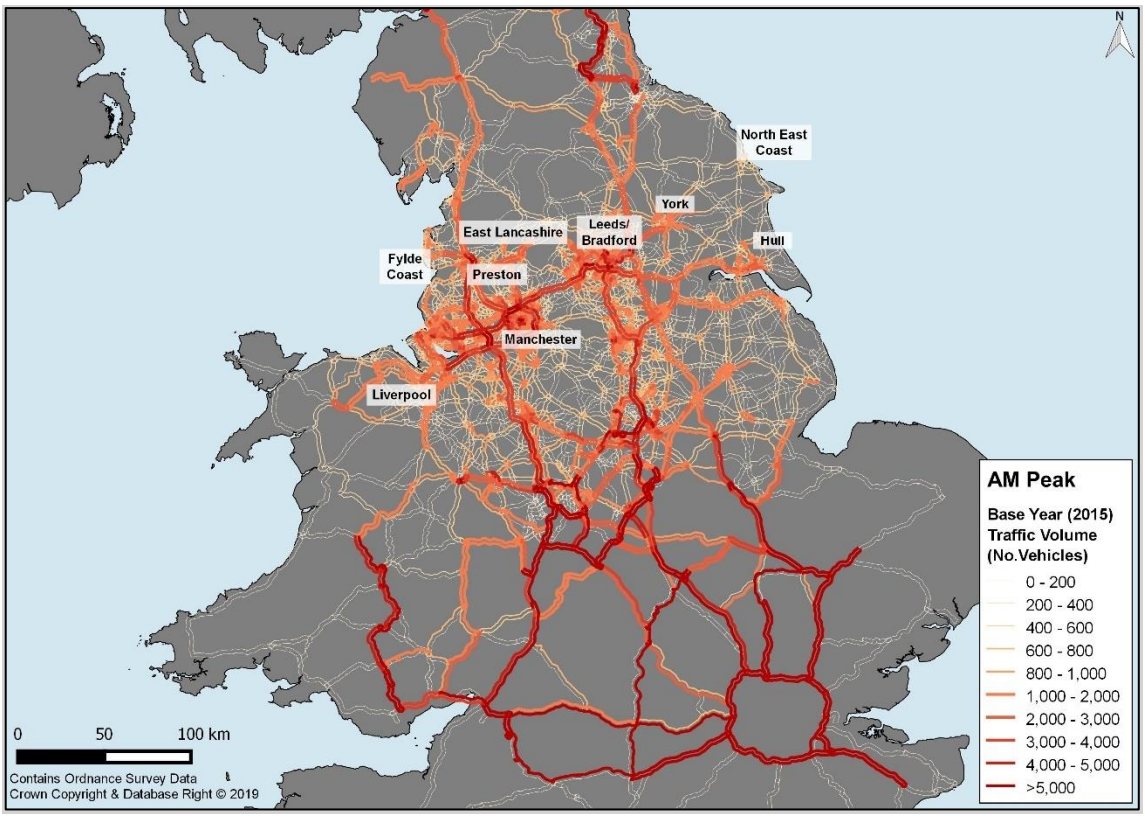
3.50 There are a high number of north south car commuter movements along the A1(M), A19 and M1 spanning from Doncaster to Newcastle and beyond. The A1 to Scotland shows commuters to/from Berwick. There are other rural towns that demonstrate commuting patterns to major urban areas such as the towns along the A68 and A696 corridor in Northumberland, and Consett and Barnard Castle in Durham.

3.51 Looking elsewhere across the North, Partners such as the Sheffield City Region are supporting enhanced connectivity to the Humber Ports to build on the established links via the M1 and the M18 to the specialist freight hub of Doncaster Sheffield Airport for the very same reason. Easily accessible locations to major roads and container ports are key to supporting the Sheffield City Region's ambition for logistics, building on existing investment by the likes of Aldi and ASOS in the Dearne Valley and Markham Vale to the south as well as the Doncaster iPort, the intermodal rail terminal at Junction 3 of the M18.

3.52 Much of the MRN for the North, is currently operating at or close to capacity during peak periods. Average inter-urban speeds between important economic centres are low, typically less than 30 mph during peak periods, and below 40 mph during peak periods.

3.53 The key routes of the north's network are shown to have certain points of Daily Traffic volumes exceeding 2,000 vehicles as seen in the Figure 3.8 below.

Figure 3.8: Daily Traffic Volumes[47] on the TfN Major Road Network



Rail Network

Passengers

3.54 The North currently has a modal share for rail for commuting of 3.4%, defined both in terms of residence and workplace. Whilst this is comparable with the rest of England outside of London and the South East, and potentially masks concentrations of higher rail modal share on key routes to/from the North's larger urban centres, it still indicates that overall a relatively small proportion of the North's population use rail to commute, and that there is significant scope for rail to increase its share of the market as the economy grows.

3.55 Passenger services are, as elsewhere in the UK, primarily delivered under franchise agreements between transport operators and the DfT. The North of England's two largest self-contained franchises, Northern and Trans-Pennine Express, were re-let by DfT in 2016. In the first such arrangement of its type, the two franchises are being jointly managed between the DfT and TfN, under a Partnership Agreement defining the roles and responsibilities of both parties.

3.56 Northern and Trans-Pennine Express provide the majority of inter-urban and local passenger connectivity within the North of England. Longer-distance connectivity is generally delivered via the region's principal North -

[47] Source: Highways England's Trans-Pennine South Regional Highway Model

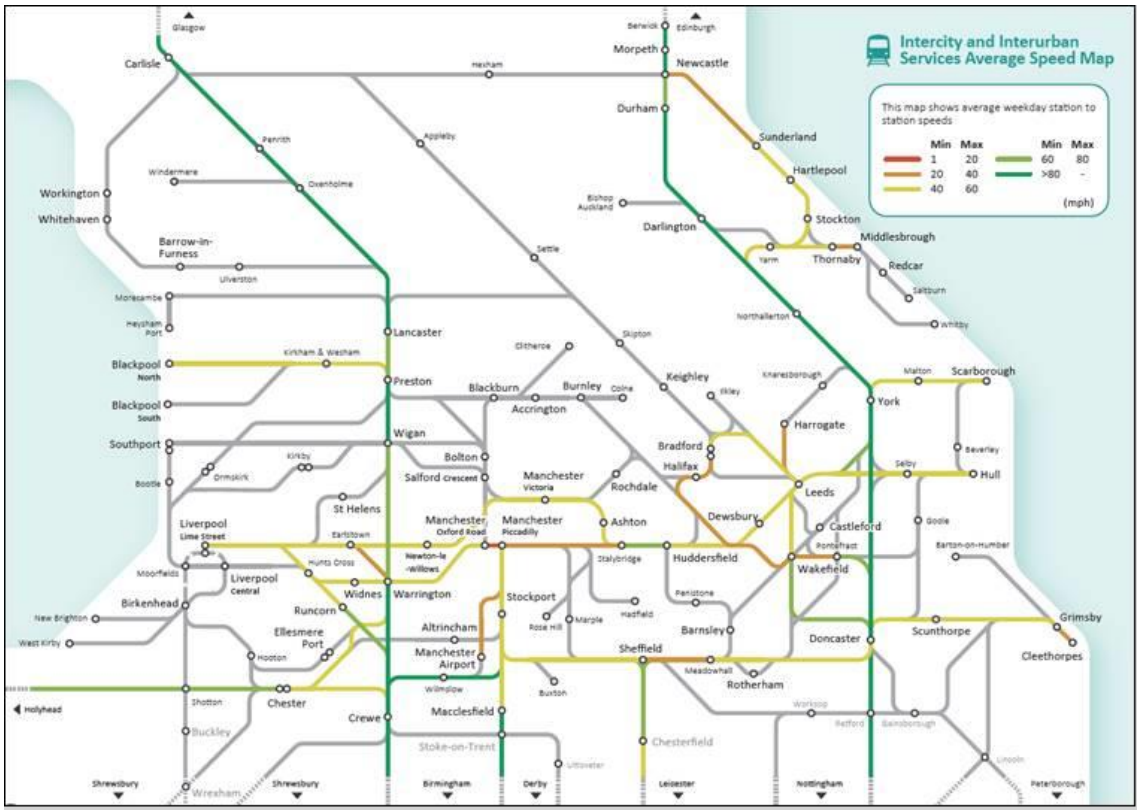
South corridor, the East Coast Mainline. The Intercity East Coast franchise is now operated as the London North East Railway (LNER) by the DfT, which took over from Virgin Trains East Coast in 2018. The Cross Country franchise also operates an important number of services between York and Newcastle. In addition, multiple open-access operators are operating or will start offering long-distance services in the near future. Grand Central operates from Sunderland and Bradford to London and is currently bidding for a service between Cleethorpes and London. Another open-access operator, Hull Trains, operates long-distance services between Hull/Beverley and London. East Coast Trains will offer services from London to Edinburgh via the East Coast Main Line from 2021.

3.57 The East Coast Main Line (ECML) connects London to Scotland via Peterborough, Doncaster, York, Darlington, Durham and Newcastle, with a westwards connection to Leeds (Wakefield Line). Although the ECML provides a key spine for North-South freight and passenger movements, the corridor is wider than a single route, encompassing parallel rail lines, including the Durham Coast Line where journey time and peak capacity are key issues that constrain opportunities. It also provides the final part of many East/West journeys across the North, including from the North East to Manchester, Liverpool and the Midlands.

3.58 It is important to the North that its businesses can readily access important suppliers, markets and collaborators beyond the North of England, particularly in key centres such as London, Edinburgh and Birmingham, as well as Economic Centres such as Cambridge. Under current conditions. some major Northern cities such as Bradford, Sunderland and Hull lack direct connectivity to other major cities, such as Birmingham and others have no direct link to London.

3.59 Aside from the ECML, the East Coast – Scotland SDC contains several low-speed, infrequent and unreliable intercity and interurban rail services, which serve to extend the perceived distance between Important Economic Centres for commuters, and act as a barrier to travel. Figure 3.9 illustrates the variations in speed on the rail network.

Figure 3.9: Intercity and Interurban Services Average Speed Map



3.60 Furthermore, issues such as overcrowding and unsuitable rolling stock can make rail travel unproductive, effectively removing one of rail's key advantages over other modes. The poor perception of rail within the north serves to increase the pressure on the road network since travelling by car represents a major travel time incentive, especially on the following east / west inter-urban corridors:

- North Trans Pennine
- Hope Valley
- Tyne Valley
- Calder Valley
- Leeds – Hull via Selby
- Doncaster – Hull via Goole
- Doncaster – Grimsby/Cleethorpes via Scunthorpe (which also provides direct connectivity between North and North East Lincolnshire and Manchester Airport)
- Sheffield – Lincoln via Worksop.

3.61 The network of routes in the North East and Tees Valley provide important connectivity between urban economic centres. At the northern end of the Durham Coast route, the Tyne & Wear Metro operates in parallel with heavy rail services, providing a high frequency service between Sunderland and the wider Tyne & Wear area. However, this means the route is heavily

utilised. In the Tees Valley, passenger services operate across the Darlington, Stockton, Middlesbrough and Redcar axis, with Middlesbrough station forming an important node connecting services from the Durham Coast, Esk Valley and Tees Valley corridors, as well as longer-distance services.

3.62 Investment at rail stations and the surrounding networks at locations including Darlington, Durham, Middlesbrough, Newcastle, York, Hartlepool, Morpeth, Doncaster and Sunderland would help to increase capacity, promote economic growth, and make the most of the opportunities to be provided by HS2. There are existing capacity, operability, timetabling, and reliability constraints along the corridor, which is limiting economic growth and the movement of people. Effectively resolving these competing demands, particularly in the context of HS2 and Northern Powerhouse Rail is crucial to realising the potential of the rail network in this corridor.

3.63 With regard to tourist connectivity, timetables and capacity provision are not always aligned to seasonal demand patterns and special events, with evidence of overcrowding at key times, and poor direct links to rural or peripheral tourist destinations. Furthermore, the configuration of rolling stock is often not suited to larger groups or significant luggage requirements.

Currently, rail service provision from Important Economic Centres to their catchments in the evening is inconsistent, with a more sporadic timetable unable to service the burgeoning night time economy of cities such as Leeds, York and Newcastle, especially on Sundays. Service improvements committed in the Northern and TransPennine Express franchises will go some way towards addressing these issues, but gaps will remain.

3.64 With regards to international connectivity, passenger rail provides:

- surface access (either directly or via interchange with other modes) to the North's airports (particularly Manchester, Newcastle, Liverpool John Lennon, Leeds Bradford, and Doncaster Sheffield), ensuring that airports can draw upon the widest possible catchment areas, making it attractive for airlines to expand global connections.
- wider rail connectivity to continental Europe via the HS1 Link and the Channel Tunnel.

3.65 Rail can play a significant role in addressing the barriers to travel faced by a diverse section of society. Accessibility both to/from and at rail stations and on trains should not be barriers to travel and TfN is committed to supporting improvements to stations and trains and influencing new franchise commitments to reduce the barriers to travel for all.

3.66 HS2 Phases 1 and 2a will provide a step-change in north - south connectivity once completed in 2026/27. Current proposals for Phase 2b of HS2, intended for completion in 2033, will create a further line which will link Leeds and Sheffield to London via the East and West Midlands. From this, link to the East Coast Main Line at York will allow high speed services

to serve destinations north of York, including Darlington, Durham and Newcastle.

3.67 The North of HS2 to Scotland Working Group (comprising of representatives from DfT, TS, HS2 Ltd, NR) was set up to conduct a feasibility study looking at two key options for HS2 connections from Newcastle to Scotland[48]. This option would see a single optimal route corridor which could be built in three phases and help deliver 45 min journey time between Newcastle and Edinburgh and a three-hour journey time between Newcastle and Aberdeen. (in combination with Aberdeen to Edinburgh improvements). Transport Scotland has commissioned Network Rail, LNE Route to identity options for, and the feasibility of, extending two or more 400m platforms within Newcastle Station accessed from an extended footbridge.

Domestic Freight Connectivity

3.68 Most rail freight services are operated on a commercial basis, with competition both between operators and between different mode options (road, waterways etc). Key rail freight nodes in the North of England include the international gateways – ports and airports, Wakefield Europort and Selby, and intermodal terminals including those at Leeds Stourton, Doncaster and Teesport. Intermodal terminals are operated by private freight & logistics companies.

3.69 The major freight flows are concentrated from the Port facilities on the Humber and Tees, across the Pennines towards Manchester and Liverpool and to the south to other parts of England. Therefore, rail freight access to ports is critical. The following ports all are accessible via the rail network:

- the Port of Hull, Grimsby & Immingham
- the Port of Tees & Hartlepool;
- the Port of Tyne; and,
- smaller ports at Goole, Seaham, Sunderland and Blyth.

3.70 Major intermodal rail freight terminals are located in Leeds, Wakefield, Doncaster and at Teesport where onward journeys by road are required to deliver containers to their intended destinations or pick them up to begin their journey to one of the UK's major ports. Encouraging more freight by rail and water (rather than road) will require enhanced and / or additional freight terminals at strategic locations.

3.71 The most significant freight routes in the study area are on the M62, M1, A1(M), A63 and M180/A180 corridors. Immingham & Grimsby are accessed by the M180/A180 and A160. The M180 terminates several miles west of the Immingham & Grimsby ports. The A19 and A66 are also major freight routes, particularly for traffic to and from the ports of Tyne, Tees & Hartlepool, both roads also feed freight on and off the A1(M). Freight is especially vulnerable to resilience issues on the MRN as the primary users

[48] **https://news.gov.scot/news/cross-border-rail-improvements-planned**

of the network and due to operational needs for timeliness of deliveries and the cost of delays.

International Freight Connectivity

3.72 The GB freight industry processes around a billion tonnes of goods per annum moved between producers (or importers) and consumers, not including the pipelines that carry water, gas, petroleum and chemicals. For around 40% of that tonnage, one end of the supply chain is outside Great Britain. These goods are carried by various combinations of road, rail, sea and air and in many cases involve multiple legs by passing through intermediate distribution centres. When these additional legs are taken into account, a figure of around 1.97 billion tonnes of goods lifted emerges, including both the road and rail legs where there are transfers between modes.

3.73 Approximately one third of this activity takes place to, from, within or through the North of England. Northern Ports account for approximately 35% of all GB ports traffic. Of the 2,254 warehouses that exceed 8,000m2 of floor space and account for most non-bulk freight in Britain, 34% are in Northern England. However, the North's share is not entirely uniform. Only 24% of all container and trailer trade is through Northern Ports because of the dominant position of Dover and the Channel Tunnel for European trade and the three south east container ports of Felixstowe, London and Southampton. There is scope for the major Northern ports' share to rise to use the capacity they have available.

3.74 Freight and logistics are a key element of the East Coast to Scotland corridor, connecting the major ports on the Tyne, Wear, Tees and Humber with the strategic road network via the A1(M) and M1 to the rest of the North and beyond to southern England and Scotland. At the UK level, approximately 37% of freight tonnage uses ports in the North, contributing nearly 20% of GVA (£4.4 billion). In contrast to the heavy volumes of port goods, the volume of high value air freight makes up only a very small percentage of freight to/from the UK (around 2.3 million tonnes of freight).

3.75 There are seven major freight ports within the East Coast to Scotland corridor and its wider catchment area, along with a number of minor ports. These ports account for almost 23% of all UK sea freight in 2016 with Grimsby and Immingham being the largest, handling 11% of all UK port volumes and Tees and Hartlepool the second largest, handling 6% of UK total sea freight.

3.76 In the UK, port volumes have fallen by approximately 17% since 2005; the ports within this corridor area have seen volumes plummet by up to 27% since 2005. This is primarily due to the reduction in bulk cargo such as coal with ports now looking to alternative revenue streams such as Intermodal (forecast to grow by over 75% between 2010 and 2030) and alternative fuels such as biomass. Ports, including the minor ports across the SDC, have significant potential to grow as connectivity to them is improved from

the national road and rail transport network and as the political landscape changes to permit the establishment of Port Free Trade Zones for example.

3.77 Surface access to the North's five key rail-connected port areas on major estuaries (Humber, Immingham, Tees, Mersey, and Tyne), and several rail-connected sub-regional ports. In 2017, 176 million tonnes of freight were transported through ports in the North, 37% of the Great Britain total.[49] In addition, the North boasts a network of inland waterways (such as the Manchester Ship Canal access to Trafford Park, access to Hull via the Humber, etc.), where rail may play a role in improving intermodal connectivity.

3.78 The corridor area has a relatively small international airfreight market, with airports outside of the corridor providing greater international connectivity. There are however significant international airports within the SDC at Newcastle, Durham Tees Valley, Humberside, Doncaster Sheffield and Leeds Bradford. The only notable air freight volumes are carried out of Newcastle Airport (5,482 tonnes in 2017) and Doncaster Sheffield (8,657 tonnes in 2017). Newcastle Airport recorded 20% growth in freight volumes in 2017, whereas Doncaster Sheffield's freight volumes fell by 7% in 2017 but there are plans for growth in air freight within their vision plan. Newcastle's long-haul route (Emirates to Dubai) has recently increased freight volumes significantly.

3.79 Increasing the opportunities for freight to be shipped via northern airports could contribute to traffic reductions on north-south routes as well as increasing competitiveness.

Visitor Economy

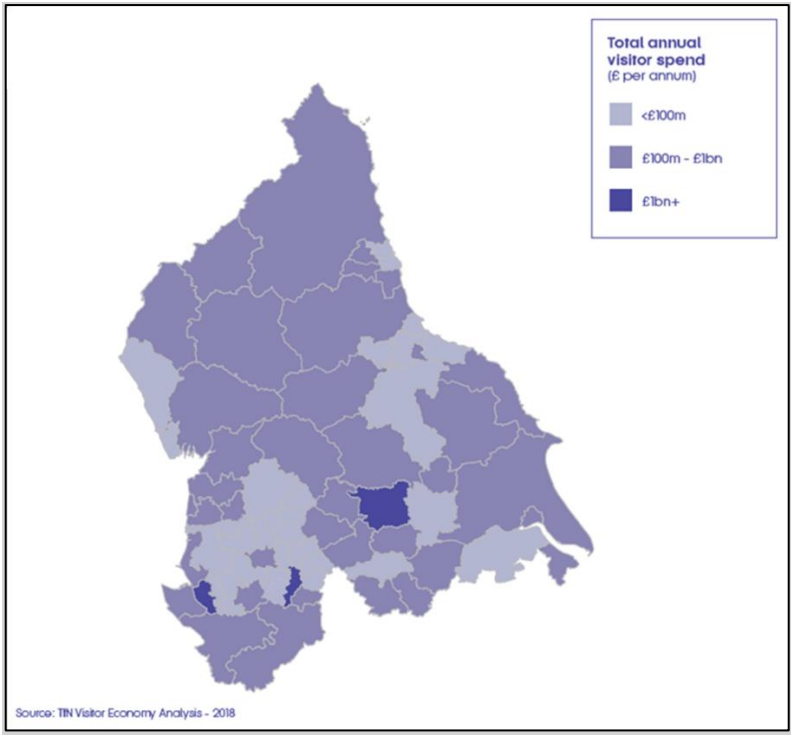
3.80 The visitor economy is a significant employer in some parts of the North, with over 25% of employment. These areas tend to be, but not exclusive to, the more rural areas of the North. The NPIER capabilities do not explicitly cover the economic value added to the north of England by tourism. It is therefore identified within this report on the basis of the significant and increasing role that it plays in maintaining the vitality of Important Economic Centres.

3.81 The North's visitor economy currently consists of over 369 million visitors per year, contributing more than £17 billion to the economy, including over £2 billion from overseas visitors[50]. The total visitor spend is currently distributed across the North as shown in Figure 3.10 below.

[49] DfT 2018 - Port and domestic waterborne freight statistics, PORT0101

[50] TfN Visitor Economy Analysis - 2018 – Undertaken by Merseytravel

Figure 3.10: Total Visitor spend[51]



3.82 The East Coast – Scotland SDC largely consists of England's North East and Yorkshire regions. Combining the areas of the East Coast – Scotland SDC, around 170,000 people have found employment within their respective tourism industries[52]. Key visitor hotspots include York, Northumberland, Hull, East Riding of Yorkshire, North York Moors National Park, Leeds, Sheffield, Newcastle and Durham[53]. Leeds, Newcastle and York are captured within the top 20 most visited destinations in the UK for overseas and domestic visitors[54].The Flamingo Land Theme Park and Zoo and the Yorkshire Wildlife Park are the only top 20 paid visitor attractions in the East Coast area.

3.83 The visitor economy and transportation share a symbiotic relationship in where the visitor economy creates demand for a good transport network whilst transport links concurrently sustaining long term growth for visitor destinations. This is evident between October and December of 2018,

[51] Data sources: Great Britain Day Visit report 2013- 2015&2017, GB Travel Survey 2013-2015, International Passenger Survey, ONS/Visit Britain, 2015 and 2016

[52] **http://www.tourismalliance.com/downloads/TA_395_420.pdf**

[53] **https://www.visitengland.com/destinations/north-east-england**

[54] **https://transportforthenorth.com/wp-content/uploads/Visitor-Economy-and-Transport-Demand-in-the-North-Analysis-min.pdf**

where 3.91 million tourist trips were made to Yorkshire, The Humber and the North East, accounting for £662 million in expenditure[55].

3.84 In 2013, the GVA added by the combined tourism industries of the North East, Yorkshire and The Humber accounted for £4.8 billion.

Transport and the Environment

3.85 The transportation sector accounts for 24 percent of the UK's greenhouse gas emissions. The pollutant causing most concern is nitrogen dioxide (NO2), which is emitted by road transport and is subsequently driving the development of Clean Air Plans. In October 2017 the Government published 'The Clean Growth Strategy'. This includes measures to accelerate the shift to low carbon transport. Poor air quality impacts large parts of the East Coast study area.

3.86 Currently 70 Air Quality Management Areas (AQMAs) have been declared in the East Coast corridor[56]. These include:

- 8 throughout South Tyneside, Newcastle, Gateshead and County Durham
- 2 throughout Scarborough and Ryedale
- 9 throughout Harrogate and York
- 3 throughout Selby and Leeds
- 10 in Wakefield
- 8 in Barnsley
- 1 in Sheffield
- 11 in Rotherham
- 7 in Doncaster
- 6 throughout Hull, Lincoln, North and North East Lincolnshire
- 4 throughout Chesterfield and Bolsover

3.87 City wide AQMAs have been declared in Sheffield and Wakefield. Sections of the M1 passing through Wakefield, Barnsley, Rotherham and Sheffield have been designated as AQMA's. There are additional AQMA's of significance including the M62 through Wakefield and the A1(M) and M18 through Doncaster. Even with improved emission characteristics of the national vehicle fleet, there is some concern that any further traffic growth has the potential to impact these areas.

[55] **https://www.visitbritain.org/sites/default/files/vb-corporate/Documents-Library/documents/England-documents/gbts_-_quarterly_regional_summary_-_q4_2018.pdf**

[56] **https://uk-air.defra.gov.uk/aqma/maps**

3.88 The East Coast - Scotland SDC contains four Areas of Outstanding Natural Beauty (AONB), a statutory designation given to landscapes highly valued for their visual amenity.

3.89 Features of historic importance are located throughout the corridor; and include those protected by international, national and local designations. Of these, the most highly valued are World Heritage Sites, of which the SDC contains three: Durham Castle and Cathedral, Studley Royal Park including the ruins of Fountains Abbey, and Frontiers of the Roman Empire (Hadrian's Wall). A wide range of other historic and cultural heritage features are located throughout the corridor, especially located within or around the main urban areas. These include Historic Battlefields, Scheduled Monuments, Registered Parks and Gardens and Listed Buildings.

3.90 Throughout the SDC there are several sites designated at the International (European) or National (United Kingdom) level for nature conservation purposes. The sites protected at the International level are Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Wetlands of International Importance (Ramsar) sites. There are 22 SACs, 12 SPAs and 6 Ramsar are located within the SDC. Many areas contain multiple designations; where much of the Northumberland coast line is designated as a Ramsar, SPA and SAC. Of national biodiversity designations, there are also 266 Sites of Special Scientific Interest (SSSI) and 13 National Nature Reserves (NNR).

3.91 Where possible, proposed interventions should avoid sensitive areas, and where this is not feasible, measures should be implemented to mitigate the negative impacts or consider options which might enhance the environment alongside the stated objectives. In national planning policy there is a strong presumption against any significant road widening or the building of new roads through a National Park, unless it can be shown there are compelling reasons for the new or enhanced capacity. In order to satisfy these tests any schemes will need to contribute positively to the local environment by achieving net benefits to the wildlife and landscape qualities of the area and finding opportunities to promote access to the National Park.

3.92 The aim is to increase opportunities for people to experience the landscapes and special qualities of the area. Such an approach will require exceptional standards of design from the outset to achieve an exemplar solution which contributes positively to the sustainability and quality of life in the area. An assessment of environmental impacts would be required as schemes are developed further.

Growth Forecasts

3.93 Transport for the North has produced a Northern Transport Demand Model that estimates how changes in employment, population and the transport network could affect travel patterns across the North. The model uses the transformational growth in population and employment from the Northern

Powerhouse Independent Economic Review to forecast transport demand on the road and rail networks in 2050.

3.94 To reflect uncertainty regarding key factors affecting travel demand, Transport for the North has developed various future scenarios representing the potential variation in travel markets in the North by 2050. The assumptions have been grouped so that each scenario represents a coherent and plausible future. No single scenario is more likely than any other but taken together they represent the likely range of outcomes in travel demand in the North.

3.95 The future scenarios of the transformational growth are set out in the Northern Powerhouse Independent Economic Review. All scenarios are possible, and indeed may manifest themselves differently across the North depending on spatial planning policies, but this initial forecasting provides a base understanding of the potential future transport demand in a transformed North.

3.96 In a transformed North, total demand for road travel is forecast to increase by up to 54% by 2050. This would mean an increase from the current level to 193 billion vehicle kms travelled in the North by 2050. In a more connected North, the growth in road travel demand between the main urban areas is greater than within those areas. In 2015, approximately 34 billion vehicle kms were travelled between these areas in the North, and by 2050 this is forecast to increase to between 37 and 68 billion vehicle kms.

3.97 Using the forecasts from the recent research into the North's labour market, further analysis has been undertaken to understand how improved transport connectivity could change commuting patterns and labour markets across the North. The analysis considers alternative patterns of spatial clustering of jobs, either clustered around towns and city centres or more dispersed across urban areas, and how jobs are undertaken, using either face-to-face interaction or digitally, in multiple scenarios.

3.98 Total demand for rail travel is expected to be up to four times higher than today, which would mean an increase in the current total to around 760 million trips in the North by 2050. The strongest growth in rail demand is between the largest urban centres in Greater Manchester, Liverpool, Sheffield, Leeds, Hull and Humber, and the North East. In 2015 approximately 43 million trips were made between these centres. By 2050 this is forecast to increase to between 105 and 281 million trips, which is between four and six times the level today. In a more connected and integrated North, the level of rail commuting could increase by up to eight times the level today.

3.99 Across the demand scenarios, analysis suggests an increased propensity for people who live in the North to commute to work outside of their home local authority. This is driven by the strong growth projected for high skilled workers in the transformational scenario through to 2050 and the assumption that high-skilled and high-paid workers are much more likely to commute and travel longer distances than lower-paid workers.

Highway Network

3.100 The strongest road growth in the East Coast - Scotland SDC is forecast between the areas of Tyne and Wear and the Tees Valley. Growth between York, North Yorkshire and East Riding and the Humber is also forecast. Total demand for road travel between the North East and Tees Valley LEP areas is expected to increase by up to 131% by 2050 over the course of a typical weekday inter peak period.

3.101 Total demand for road travel between Leeds City Region and York, North Yorkshire & East Riding LEP (excl. Humber) areas is expected to increase by up to 60% by 2050 over the course of a typical weekday inter peak period

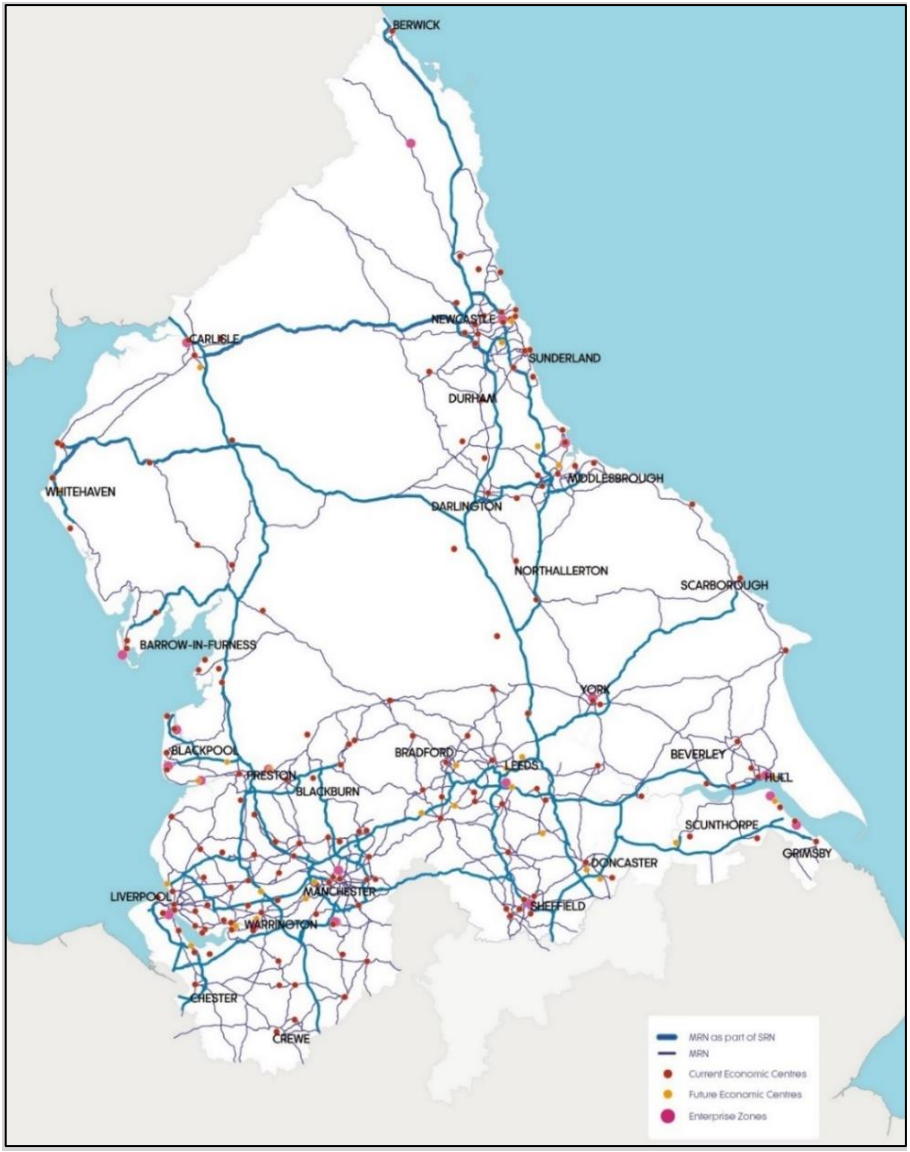
3.102 Total demand for road travel between the Leeds City Region and York, North Yorkshire & East Riding LEP areas is expected to increase by up to 60% by 2050 over the course of a typical weekday inter peak period NTDM transformational growth forecasts material increases in road trips. Underlying these growth forecasts are assumed supporting improvements in the northern transport network. Without such intervention, the forecast growth will not occur; the present road network in the East Coast to Scotland SDC has neither the capacity nor the capability to accommodate the additional trips.

3.103 In the absence of intervention, the growth that does occur is more likely to be focused on those parts of the highway network which has the greatest capacity and benefits would be less well distributed. The outcome would not support TfN's STP objectives, underpinning a clear Need for Intervention and justification of TfN's promotion of pan-Northern transport schemes to address its objectives.

3.104 The various routes within the East Coast strategic development corridor in its present state experience major road congestion and exhibit restrictions to accommodate the huge future growth that is predicted.

3.105 Figure 3.11 illustrates the roads which are included in TfN's Major Road Network (MRN).

Figure 3.11: TfN's Major Road Network (MRN)



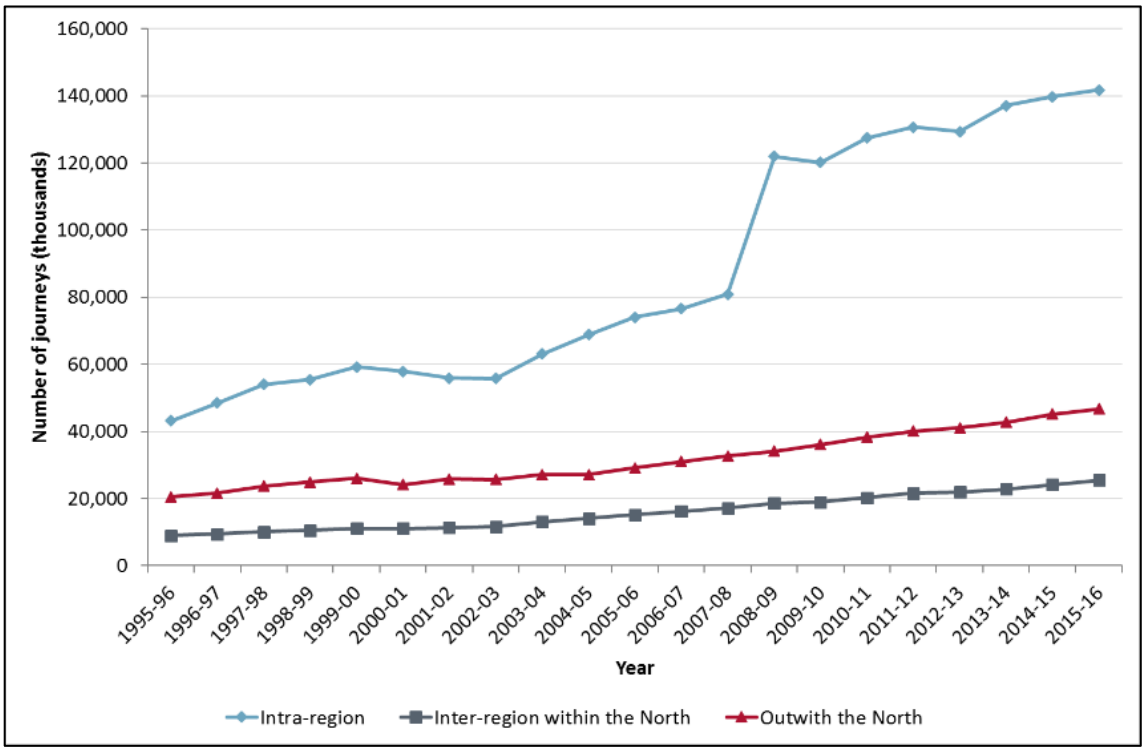
Rail Network

3.106 Based on TfN's forecasts, the strongest rail growth in the East Coast – Scotland SDC is forecast between the North East and Leeds City Region / Tees Valley. Growth between York, North Yorkshire and East Riding / Leeds City Region and the Humber is also forecasted over the constrained rail network.

3.107 Total demand for long distance rail travel (> 50km) between the North East and Tees Valley LEP areas is expected to increase by up to 314% by 2050 for a typical weekday. While the total demand for long distance rail travel (> 50km) between Leeds City Region and York, North Yorkshire & East Riding (excl. Humber) LEP areas is expected to increase by up to 301% by 2050 for a typical weekday. Total demand for long distance rail travel (> 50km) between the Leeds City Region and York, North Yorkshire & East Riding LEP areas is expected to increase by up to 195% by 2050 for a typical weekday.

3.108 Between 1995/96 and 2015/16 total rail demand across the North increased by 195%, with the largest increases observed in intra-regional trips - journeys which both began and ended wholly within one of the North East, North West or Yorkshire & Humber sub-regions. This change in demand is illustrated by Figure 3.12 below:

Figure 3.12: Passenger journeys in the North



Source: SDG analysis of ORR Data Portal, Tables 15.5, 15.6 and 15.12 for the Integrated Rail Report

Freight Movements within the North

3.109 With the proposed rise in freight traffic from 2016 to the forecast year of 2050 with NPIER Growth, there are significant concerns regarding regional air quality and contribution of emissions to the atmosphere in the North. Within the Corridor, the largest road freight growth is predicted to be on the M1 south of Sheffield. The routes to the North including the A1(M) will experience lower growth overall.

3.110 There are also significant industrial facilities clustered around the Humber and the Tees which generate a number of freight movements. Resilient connectivity to and from the ports on the road, rail and inland waterway networks remains an important focus to ensure effective access to all markets and to ensure that options are available to use rail and water for the movement of goods when appropriate.

3.111 We have therefore considered this intervention that could re-route rail freight onto less congested routes and to alternative terminals. Northallerton to Newcastle: via Eaglescliffe and then via a reinstated Leamside line between Tursdale Jn and Pelaw Jn and gauge clearance

upgraded Stillington Line, instead of the East Coast Main Line (ECML). This means that the increased frequency of passenger services envisaged will not be forced to operate at the speed of freight trains.

3.112 This re-routing would require: The loading gauge (bridge heights) to be improved on some lengths of route to the W10 or W12 standard - to cater for intermodal containers on standard metre-high wagons and potentially signalling to be improved to cater for larger volumes of traffic.

3.113 Figure 3.13 and Figure 3.14 provide an illustration of the forecast growth in rail and road freight cargo respectively in the East Coast – Scotland SDC.

Figure 3.13: 2016 to 2050 Difference in Rail Cargo Tonnes in East Coast - Scotland SDC

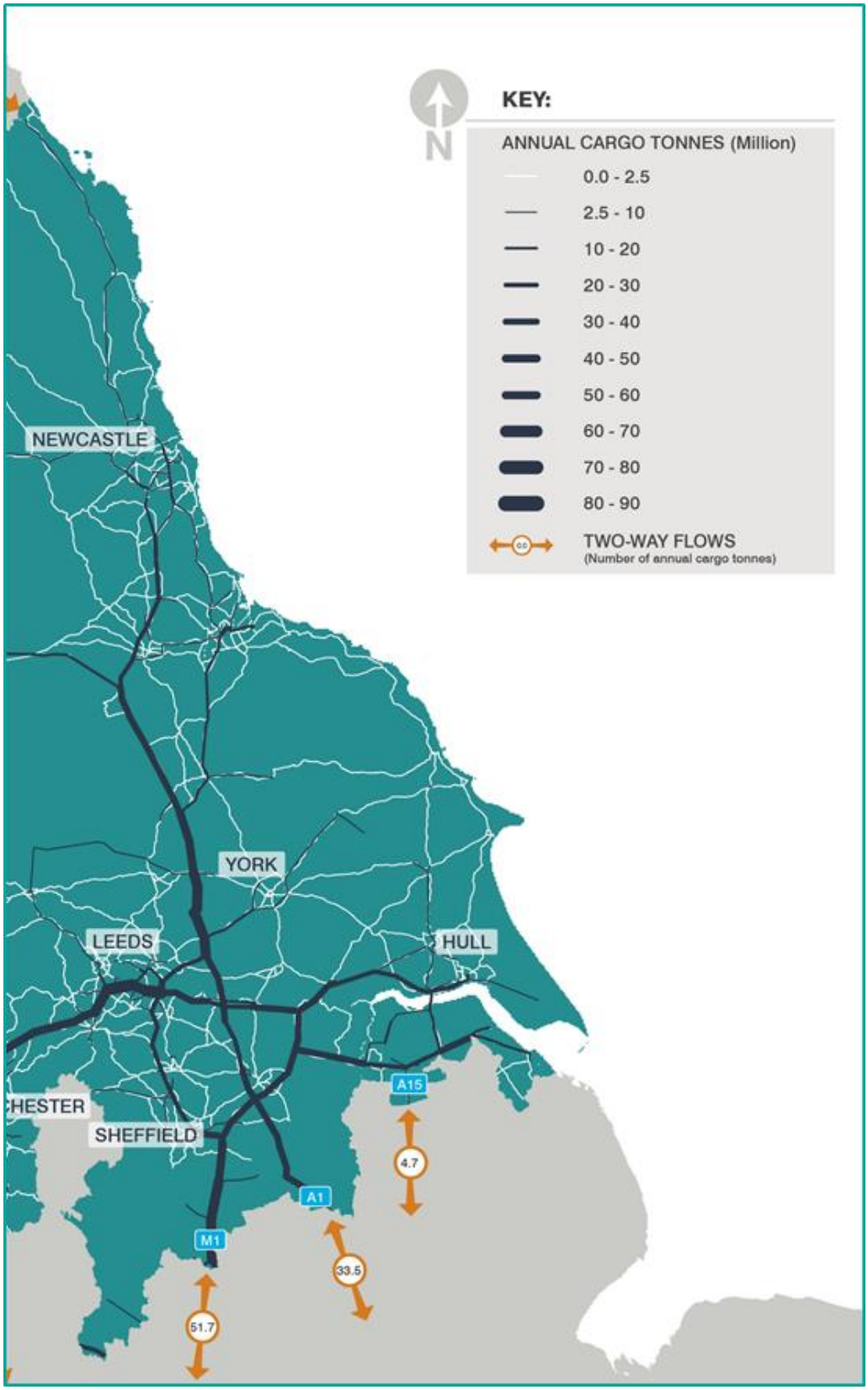
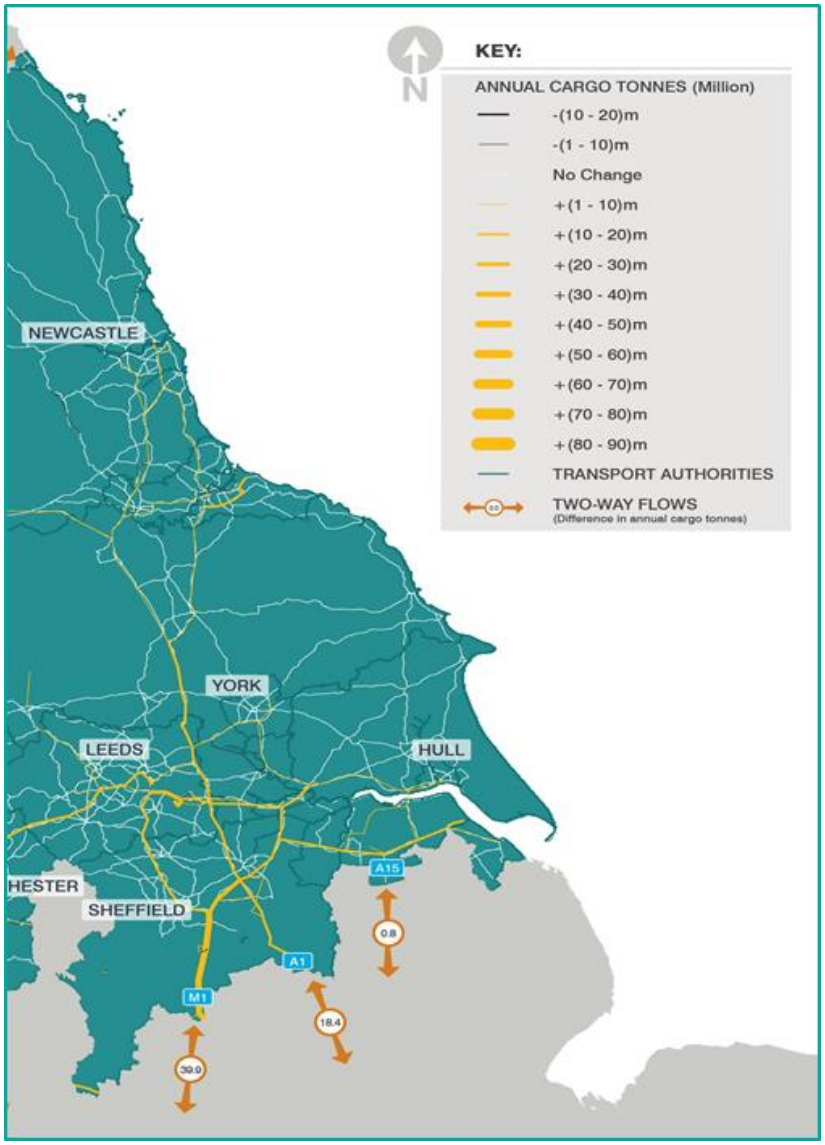


Figure 3.14: 2016 to 2050 Difference in Road Cargo Tonnes in East Coast – Scotland SDC



Future Technologies and Societal Change

3.114 We are potentially at the start of profound change in how we move people, goods and services around. This is driven by innovation in engineering, technology and business models. The gathering pace of technological change through the delivery of higher speed and capacity digital networks, the connection and automation of vehicles, the adoption of robotics, zero emission propulsion, sharing of transport assets and new approaches to payment could transform the travel and the provision and management of infrastructure and services. Globally, nationally and locally, vehicle, infrastructure and service providers, across both the public and private sectors are investing in and adopting a range of new technologies and will disrupt current travel markets; however, the scale and timing of transformational change is unclear.

3.115 Furthermore, these disruptors to transport will not only affect the way transport networks are used, they will also shape whether and when people make journeys. The ability to operate remotely from the traditional work place, access health, education and other daily needs from home, and the ability to work while travelling may lead to shifting travel patterns and reductions in the need to make journeys during the established and narrowly defined weekday morning and evening peak periods.

3.116 With specific reference to this SDC, partnerships have been established which are seeking to promote and enhance emerging technology relating to transportation. These partnerships and initatives are already reaping success, with Tees Valley recently receiving a £1.3m grant to build refuelling stations for hydrogen-powered vehicles at Middlesbrough and Redcar, whist a similar initiative is being promoted to make Teesside a 'hydrogen powerhouse'. The 'Establishing the UK Hydrogen Corridor,' initative has also been shortlisted by the government for funding, with an award announcement due in late 2019.[57]

3.117 There are significant variations in digital connectivity across the North. The fixed and mobile network coverage is primarily strong in the main centres, with the latter having greater coverage through the delivery of 4G into more remote areas. However, there is a considerable gap in connectivity the further away populations are from the North's main conurbations. This limits opportunities for e-commerce, home education and tele-working in areas already suffering from poorer levels of physical connectivity, damaging the North's ability to reach local, regional, national and global markets from less connected areas.

3.118 The Infrastructure Commissions report into 5G and telecommunications technology suggested that high speed communications should be installed along all major transport corridors. With a digital backbone associated with road and rail networks, provided through fixed and mobile infrastructure facilitated by a number of providers, as well a consistent 'utility' of digital provision to all homes, business and centres for services, the true potential for hyper-connectivity can start to be realised. Major infrastructure upgrades implemented in the corridor should consider the potential to contribute to the 'digital backbone'.

3.119 The national transport infrastructure providers are continuing to roll out digital technologies to their networks with both Highways England and Network Rail delivering both operational and monitoring systems to provide efficiency improvements users. However, at the local level there are varying levels of uptake of digital and smart systems for network management and providing services to users. Furthermore, issues in the Corridor associated

[57] **https://www.ukri.org/news/sipf-strong-bids-will-be-taken-forward-to-final-decision-stage/**

with transport connectivity and the associated environmental impacts may be reduced through technological advances in:

- Connected Vehicles;
- Automation and robotics;
- Zero emission propulsion;
- Shared assets;
- On account payment systems; and
- Additive Manufacturing.

3.120 Whilst uncertain, technology has the potential to reduce the demand for travel as well as enabling significant benefits to both those using the transport network and to network operators. Further work on transport interventions will need to take account of the potential impacts of technological and societal changes.

Transport challenges and economic opportunities

3.121 The fundamental challenge for the North's economy is to improve the economic interaction between the key economic clusters and assets of the North to improve the sharing of knowledge, supply chains, resources, and innovation to drive agglomeration benefits and productivity. Physically connecting the North's towns, cities, economic centres and international gateways will facilitate this. It can also create agglomeration economies centred on areas of commercial and industrial specialisation.

3.122 There are distinct economic strengths in each of the SDCs that require support from future transport investment as well as important connectivity challenges that need to be overcome, if the North as a whole is to deliver transformational growth. While significant investment in transport infrastructure is currently planned for the region, there is a need for a programme of further Pan-Northern investments to maximise and realise the opportunities from the major transformational infrastructure projects such as HS2 or NPR.

3.123 Better transport connectivity increases the physical proximity of firms, workers and consumers and concentrates economic activity into clusters. Improving transport connections between the North's cities, towns, economic centres, infrastructure and assets allows for greater opportunities. This will be supported by a strong logistics industry. This section presents the key transport challenges and economic opportunities that can be realised with a programme of investments in the East Coast – Scotland SDC.

Supporting business interactions within the North

Current Scenario

3.124 In spite of the North's strengths, there remain persistent and entrenched gaps in the North's GVA per capita and productivity performance compared to the rest of the UK. The North's GVA per capita gap has been consistently some 25% below the rest of England average (or 10-15% below when London is excluded) since the 1980s.

3.125 In 2014, this economic gap equated to a £4,800 per person difference in income between the North and the UK average, and a £22,500 per person difference between the North and London. Understanding the components of the performance gap helps to contextualise why the North continues to face these persistent challenges and thus how to challenge them. The performance gap is accounted for partly by an 'employment gap' – where low levels of unemployment impact on the North's GVA – but mainly by the 'productivity gap', which accounts for the largest proportion of the performance gap and is associated closely with a widening of the gap which has taken place during the post-recession period.

3.126 This performance gap has been driven in the North by a combination of factors such as:

- Insufficient high-skilled workers and too many low-skilled workers
- Not enough exploitation of innovation and technology
- Lower levels of investment
- Lower levels of enterprise (measured by business start-ups per capita)
- Lack of agglomeration
- Sub-optimal transport links and underinvestment in transport

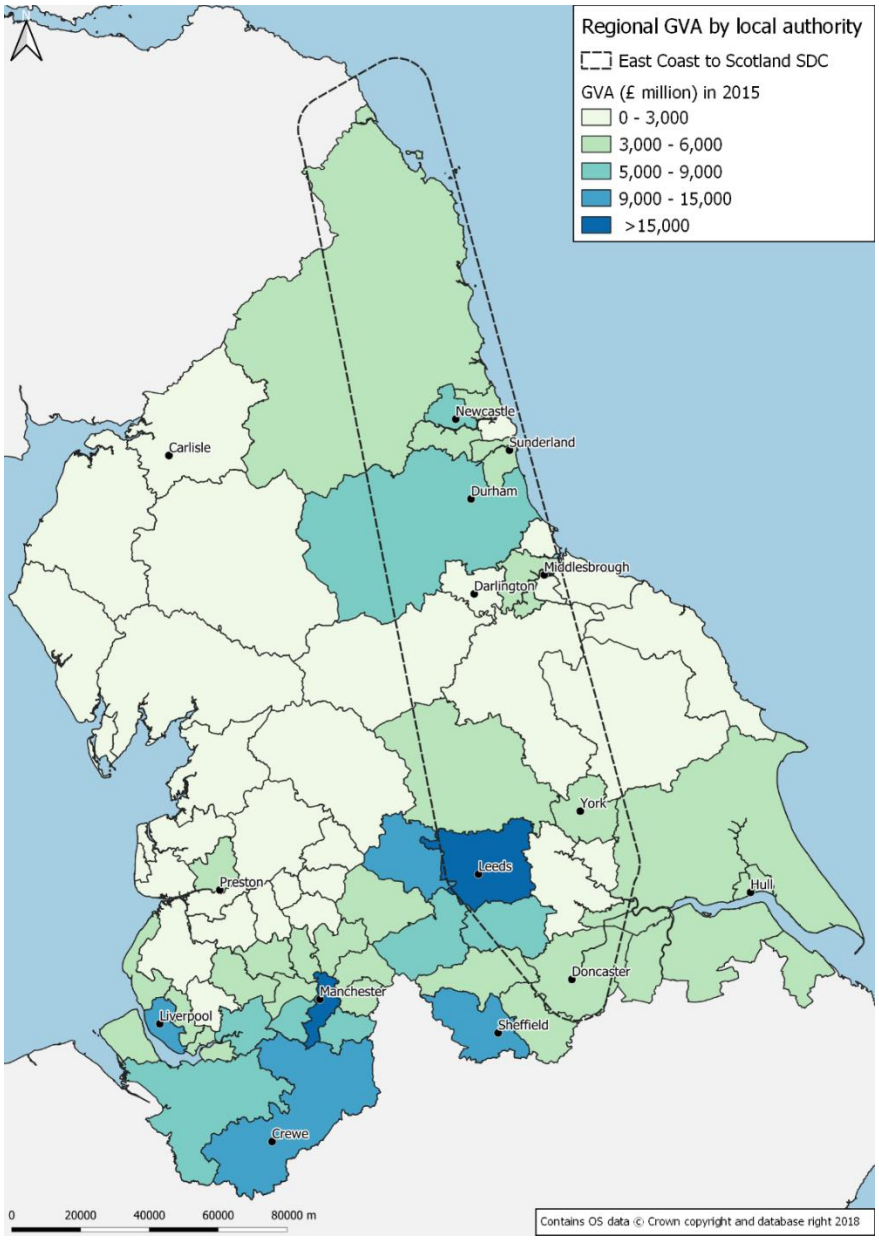
3.127 The majority of the North's workers live and work in the same local authority district. Without transformational investment in the North, these commuting patterns are not expected to significantly change in the future. However, in a transformed North, the proportion of workers taking employment outside of their home district is expected to markedly increase, from around 35% of workers to almost 60% by 2050. The greatest change is expected for highly skilled workers, which could see cross boundary commuting increase to over 70% of workers. These forecasts are a result of transformational investment in the transport system, but also growth in the North's prime and enabling capabilities, which support the benefits of agglomeration.

3.128 Whilst each city is already in relatively close proximity to each other (around 40-50 miles apart, except for Newcastle), at present there is limited interaction between cities in the North.

Future Opportunities

3.129 Increasing the effective density of each individual city, through improved transport links for example, could help foster greater agglomeration and boost productivity in those cities. Doubling the size of a city alone can increase productivity by 3-8%. Creating more dynamic places where people and businesses thrive will be an important factor in boosting productivity and jobs and realising the economic opportunity of the North's economy.

Figure 3.15: GVA change (000s) 2015-2050 for East Coast – Scotland SDC



3.130 Figure 3.15 above highlights the distribution of forecasted increases in GVA along the corridors. What is notable along the East Coast – Scotland SDC is the distance between the locations with the highest forecast growth in GVA; Leeds and areas within Newcastle including Sunderland. Areas along this corridor with the lowest change in GVA include National Parks and AONB which does account for lower economic activity and productivity compared to urban centres.

3.131 Young people and people of working age are more inclined to live near areas with more employment opportunities, with key employment sites unlikely to be within rural areas. Darlington, within County Durham, also shows low GVA change. Although being a large market town and located adjacent to the A1(M) with transport links to the East Coast Main Line, this distribution could account for the boroughs demographic population where

unemployment is high and younger people or people of working age have moved elsewhere for employment opportunities.

Supporting the needs of the North's residents

Current Scenario

3.132 A relatively small proportion of the North's population commutes by rail. This is due to factors such as the cost, convenience and perception of the rail network, as well as capacity constraints on both intra and inter-urban rail services. Many of the current journeys between Northern economic assets and clusters are slow and infrequent, both in absolute terms and compared with journeys to and from London. For example, it currently takes longer to travel by rail between Liverpool and Hull than it does to travel twice the distance between London and Paris.

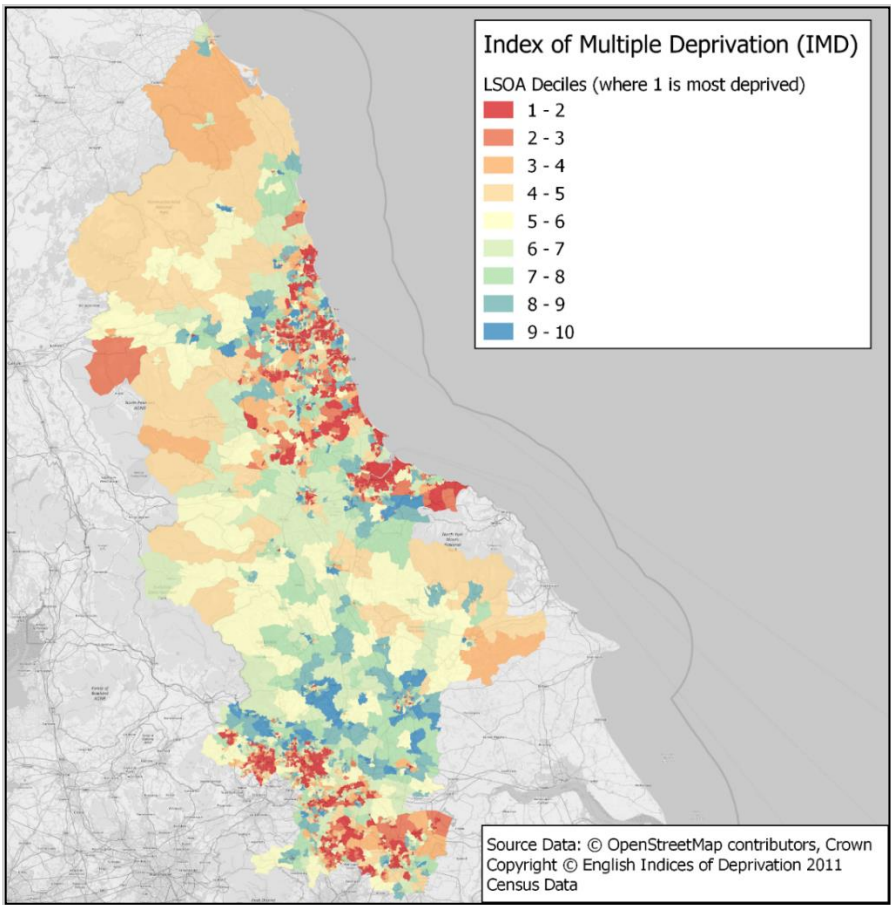
3.133 The North's transport system needs to be accessible, resilient, safe, well-maintained and accommodating for the free-flowing movement of people for work, leisure, education and other personal business trips. Better transport links make jobs more accessible, provide greater choice and can deliver a better quality of life. This will also help the North's deprived areas reach their full economic potential. For an employee seeking work, better links increase the number and range of job and career opportunities available. For an employer, better connectivity increases the ability to access and compete across a larger labour market catchment area.

3.134 Index of Multiple Deprivation (IMD) data shows that 14 of the 20 English towns and cities with the highest levels of deprivation are in the North. Furthermore, 14 of the 20 English local authorities with the lowest healthy life expectancy (both male and female) are also found in the North. Boosting the economy of the North would reduce the deficit, by reducing work-related welfare benefits and by increasing real wages and spending power.

3.135 In Figure 3.16 below, deprivation is presented on an LSOA level for areas along the East Coast – Scotland SDC. The distribution of this data ranks every small area in England from 1 being the most deprived, to 32,844 being the least deprived which are then divided into 10 equal groups, ranging from the most deprived 10% to the least deprived 10% nationally, forming into deciles. So, the most deprived 10% areas are within decile 1 and the least deprived 10% areas are within decile 10. The areas within the East Coast – Scotland SDC (as identified in Figure 20), shows that there are more than double the number of areas that are considered most deprived (594 areas in decile 1) compared to areas that are least deprived (250 areas in decile 10).

3.136 Clusters of the most deprived areas are prevalent along the North East Coast, within Newcastle, Sunderland, Peterlee and Hartlepool and surrounding Leeds, Bradford, Barnsley and Doncaster. Although Leeds shows the highest forecast increase in GVA within the East Coast – Scotland SDC, nearly 22% within the Leeds geographic area are the most deprived.

Figure 3.16: Index of Multiple Deprivation (IMD) Deciles within Lower Layer Super Output Areas (LSOA) along the East Coast – Scotland SDC



3.137 People's wellbeing can also be adversely impacted by a reduction in a 'sense of place'. This can be caused by vehicle emissions leading to dirty deposits on buildings and the corrosion of some building materials, to the transport network and associated high levels of traffic causing severance that makes it difficult or prevents people from easily accessing the services that they require in their local area.

3.138 High levels of traffic may also reduce opportunities for physical activity, for example by making it unpleasant or dangerous to walk or cycle along a route, or even by causing the perception of danger. As well as this reduction in physical activity having a direct effect in terms of health through measures such as obesity, it also helps to prevent people enjoying their locale and can also lead to reduced social cohesion.

3.139 It is important that all members of society feel able to use the transport network with confidence. Issues such as affordability, security and physical accessibility, as well as ease of navigation and ease of use, are crucial. Improving the journey experience, for example through smart ticketing and more accessible rail rolling stock, will help with this.

Future Opportunities

3.140 Rail can play a critical role in matching skilled workers with appropriate employment as a result of its specific characteristics – notably the capability

of transporting large numbers of workers into town and city centre locations without being subject to highway congestion and its associated impacts on journey time, the environment and quality of life.

3.141 For these longer-distance journeys, rail will have key journey time advantages relative to road travel, as well as enabling direct access to central locations. In some cases, particularly to/from London, connectivity is currently strong, and will undergo a further step-change improvement with the introduction of HS2.

3.142 Investment being delivered through the TransPennine Express franchise will go some way toward addressing overcrowding and improving service frequencies, and the introduction of the 'Northern Connect' brand in the Northern franchise will complement the inter-urban network by delivering a distinct customer offer and improved service quality.

3.143 As set out in the STP, a step change in the level of rail connectivity between the North's largest cities is required to support opportunities and choices to the next generation of workers and businesses. It would support economic transformation in the North by delivering faster and more frequent rail journeys linking the North's six main cities with each other and Manchester Airport. It also has potential to provide much improved connectivity for other significant economic centres, and the potential to release capacity on the existing rail network for freight and other local services. NPR will help deliver the integrated Northern labour markets that are necessary to achieve economic transformation, unlock investment potential and create opportunity and new economic choices for millions of people across the North.

3.144 Making the North's airports more accessible by public transport will allow the benefit of these assets to be felt across the North. Whilst the provision of direct rail connectivity to airports is not always achievable nor desirable, interchange between rail and other forms of public transport must be made quick and simple.

3.145 Connectivity on the wider network must enable fast and seamless journeys across the North. While some gains to airport accessibility could arise from HS2 Phase 2b and NPR schemes, they are neither currently committed nor planned to be delivered until the 2030s, and even then, will not fully address connectivity to the North. Given the constraints on rail services to the existing Manchester Airport rail station, and their importance to the wider northern economy, it is a priority to improve rail accessibility to the airport during the 2020s.

3.146 Aside from Manchester Airport, the North's other regional airports provide for direct access between international destinations and markets and their catchment areas across the North. None of these airports are served directly by the national rail network, with interchange to other forms of public transport required to complete the door-to-door journey. This requirement can pose a barrier to use, particularly for those travelling in

family groups and with luggage, and good quality information and through-ticketing is not always available.

3.147 Disruption to facilities and services can have a big impact on both the accessibility of rail services to disabled people, and on disabled people's confidence in travelling by rail. TfN will work with train operators to ensure that the needs of those with reduced mobility and hidden disabilities and appropriately and courteously provided for.

3.148 The Digital Railway programme has the potential to significantly improve both capacity and reliability through the implementation of digital signalling systems and traffic management. Harnessing this technology will enable the rail network to be more flexible and responsive to changes in demand and improve the reliability of key assets such as signalling.

International Passenger Connectivity

Current Scenario

3.149 Overall, some 43.7 million air passengers were carried on all flights to/from the North's airports in 2017, around 15% of the UK total.

3.150 The TfN International Connectivity Report (TfN 2017) stated that International passenger connectivity provided by the North's airports contributed over £5.5 billion towards the North's GVA in 2016 and this is anticipated to have increased in 2017. The largest proportion of air passengers consists of outbound leisure trips, which contributed around £0.5 billion to GVA in 2016. The bulk of the GVA contribution from passengers (£5 billion) comes from the boost to business productivity brought about through direct international air connections to/from the North's airports. In total, there were around 2 million return business related air trips to/from the region in 2016.

3.151 Whilst the North currently accounts for around 25% of the UK's population, its seven airports handle around 15% of all airport passengers in the UK and the ports around 6% of all ferry passengers. This suggests a degree of underperformance in the connectivity provided given the relative scale of the population and economic base. Based on current airport masterplans and DfT assessment, the North has potential capacity for an additional 60 million air passengers. The performance of the ports is largely dictated by geography with ports in the south of England being much closer to Continental Europe and therefore much more viable for passenger connections by sea. Annual passenger movements and their share of the UK total are shown for airports and ports below in Figure 3.17.

Figure 3.17: Annual Passenger Movements and Percentage of UK Total[58]

3.152 Within the East Coast to Scotland corridor, the major airports include Newcastle (11th largest in the UK), Leeds Bradford (15th largest in the UK), Doncaster Sheffield (20th largest in the UK), Humberside (30th largest in the UK) and Durham Tees Valley (34th largest in the UK). Passenger movements at the key northern airport for 2018 are shown in Table 3.1.

Table 3.1 Passenger movements in 2018 at Northern airports[59]

Airport	Domestic Services	%	European Services	%	Other Intl Services	%	Total
Doncaster Sheffield	58,931	5%	1,140,009	93%	22,900	2%	1,221,840
Durham Tees Valley	25,919	19%	112,685	81%	-	0%	138,604
Humberside	21,874	12%	145,580	77%	21,920	12%	189,374

[58] Source: Based on UK Civil Aviation Authority - rolling year ending October 2017; and DfT UK international and domestic sea passenger crossings (excluding passengers temporarily disembarking 'port calls' in the UK), 2017

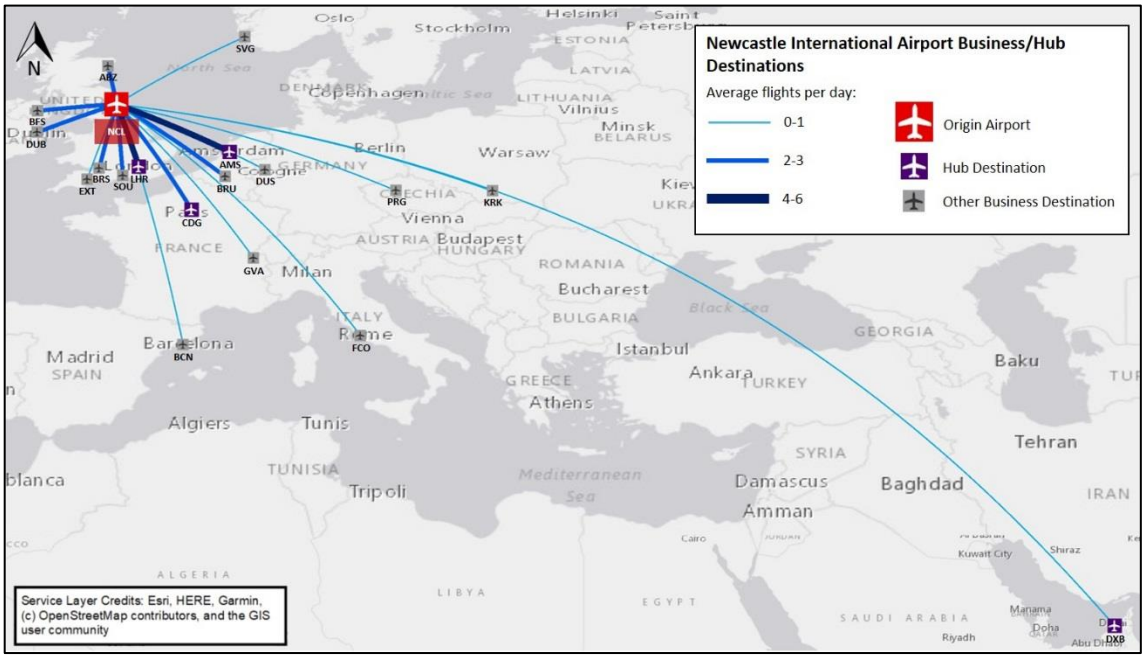
[59] Civil Aviation Authority Airport data 2018, Table 10.1 & 10.2

Airport	Domestic Services	%	European Services	%	Other Intl Services	%	Total
Newcastle	1,172,010	22%	3,552,932	67%	604,939	11%	5,329,881
Leeds Bradford	351,106	9%	3,515,579	87%	170,935	4%	4,037,620

3.153 Passenger movements via the ports are also substantial, with for example 587,000 passengers leaving Newcastle per annum via the DFDS Seaways route to Amsterdam (Ijmuiden).

3.154 Regarding access to air travel directly within the EC SDC, Newcastle International Airport is the region's largest and sees over 5 million passenger movements per year[60]. As seen in Figure 3.18 below, the airport offers a broad range of regional destinations but lacks in direct long-haul connectivity, instead connecting to hub destinations like Amsterdam, Paris and London.

Figure 3.18: Newcastle Airport Business/Hub Destinations



3.155 Easier access to the North's airports can also support additional economic growth by enabling increased development of sites near or adjacent to the North's airports. Newcastle International Airport and Leeds Bradford Airport are major employers in the Corridor, contributing £280 million and £102

[60] **https://www.newcastleairport.com/media/1289/new-master-plan.pdf**

million GVA yearly to the regional economy and 3,450 and 2800 direct jobs respectively[61].

Future Opportunities

3.156 Foreign investors are more likely to be attracted to locations that are well connected to global markets and that have access to a well-qualified workforce. The dominant airport in the North is Manchester, which offers a more extensive range of both regional and long-haul flights when compared to airports within and around the East Coast SDC. Given this greater range of direct connectivity, many people within the East Coast SDC opt to utilise Manchester Airport over their local airports. Therefore, alongside considerations for the growth and expansion of Leeds Bradford, Newcastle International, Durham Tees Valley, Humberside and the Doncaster Sheffield Airports, good connectivity between the Corridor and Manchester Airport is vital in providing destinations currently not served by them.

Moving Goods: Connectivity between the North's economic assets

3.157 At the UK level, approximately a third of freight tonnage uses ports in the North and contributing nearly one fifth of the GVA (£4.4 billion, in 2016). In addition to dedicated freight and logistics companies within the North, freight movements are an important part of supply chains for most businesses including the North's prime capabilities. The North has significant amount of distribution centre capacity covering all types of warehousing.

3.158 The growth of the online retail sector is putting enormous pressure on the transport infrastructure as the volume of goods being delivered increases and the expected service level requires same or next day deliveries. Road freight is often inherently less expensive to handle goods by road, by comparison with rail freight, since it is free at the point of access, not restricted to a timetable, and there are lower handling charges. However, a more congested, less reliant road network could hinder this.

3.159 Freight and logistics is a key element of the East Coast to Scotland corridor, connecting the major ports on the Tyne, Wear, Tees and Humber with the strategic road network via the A1(M) and M1 to the rest of the North and beyond to southern England and Scotland. The port facilities on the south bank of the Tees are also adjacent to the A66. At the UK level, approximately 37% of freight tonnage uses ports in the North, contributing nearly 20% of GVA (£4.4 billion). In contrast to the heavy volumes of port goods, the volume of high value air freight makes up only a very small percentage of freight to/from the UK (around 2.3 million tonnes of freight).

3.160 There are seven major freight ports within the East Coast to Scotland corridor and its wider catchment area, along with a number of minor ports.

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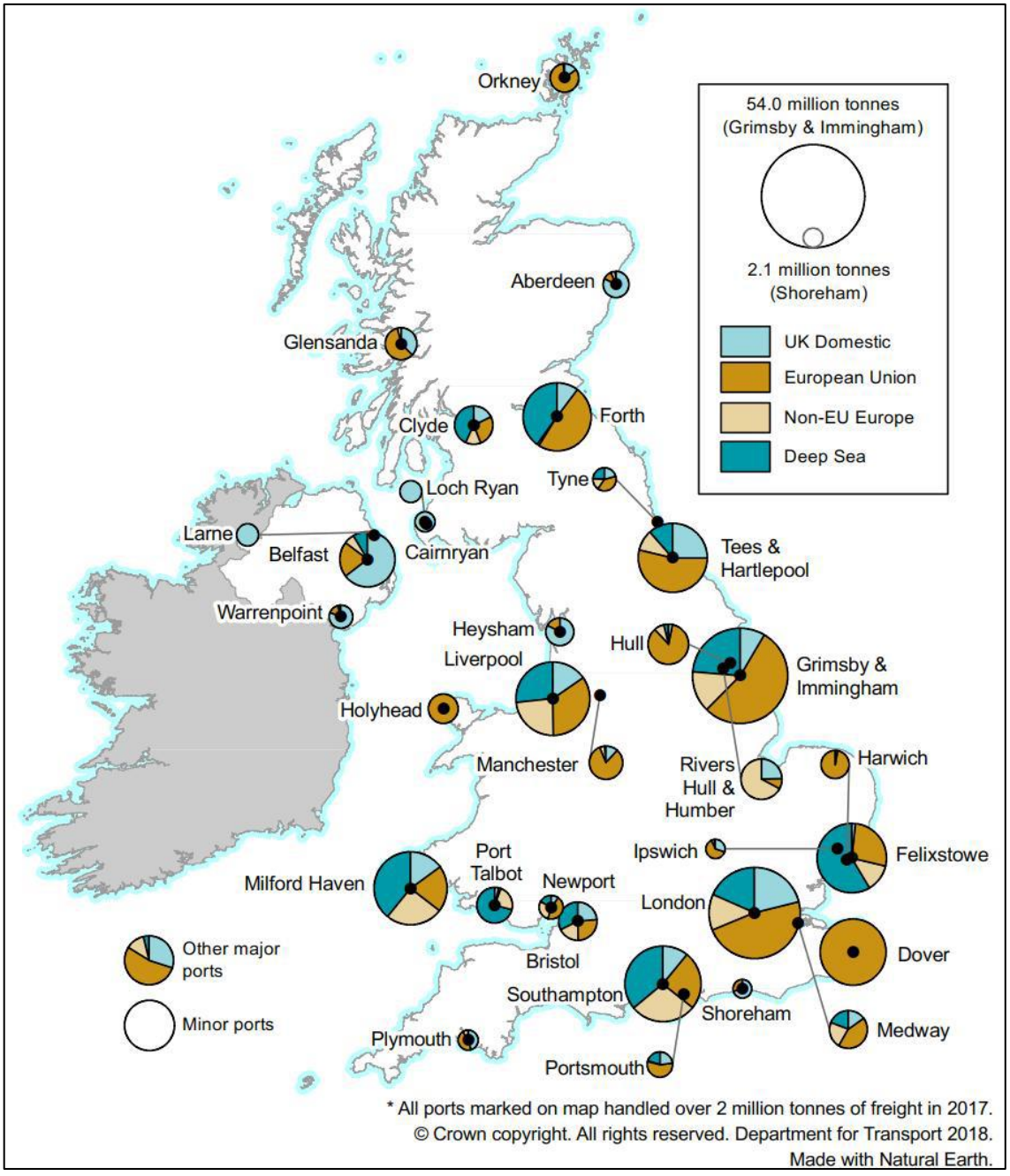
61 **https://democracy.leeds.gov.uk/documents/s133968/LBIA%20DTZ%20Report%20-%20Growth%20Hub%20Assessment.pdf**

Annual freight tonnage for the UK's major ports is shown below in Figure 3.19. These ports account for almost 23% of all UK sea freight in 2016 with Grimsby and Immingham being the largest, handling 11% of all UK port volumes and Tees and Hartlepool the second largest, handling 6% of UK total sea freight.

Figure 3.19: UK Major Ports – Domestic and International Annual Freight Tonnage[62]



[62] Source: DfT UK Port Freight Statistics, 2017 (Statistical Release August 2018)

3.161 The Enhanced Freight and Logistics Analysis[63] considers the future of road freight operations, where new technologies including Connected Autonomous Vehicles stand to revolutionise the movement of goods and has the potential to deliver improvements in emissions levels across the North.

3.162 Currently, the commodities that arrive at Northern ports stay primarily within the North, with the biggest flows to and from the ports using east – west routes. Biomass represents a significant market for the Northern ports, with Liverpool and Immingham handling large volumes to support Drax, which generates 8% of the UK's electricity. To see the Northern ports' opportunities maximised, there needs to be strong connectivity to and from them via the major transport networks.

3.163 In the UK, port volumes have fallen by approximately 17% since 2005; the ports within this corridor area have seen volumes plummet by up to 27% since 2005. This is primarily due to the reduction in bulk cargo such as coal with ports now looking to alternative revenue streams such as Intermodal (forecast to grow by over 75% between 2010 and 2030) and alternative fuels such as biomass. Ports, including the minor ports across the SDC, have significant potential to grow as connectivity to them is improved from the national road and rail transport network and as the political landscape changes to permit the establishment of Port Free Trade Zones for example.

3.164 The corridor area has a relatively small international airfreight market, with airports outside of the corridor providing greater international connectivity. There are however significant international airports within the SDC at Newcastle, Durham Tees Valley, Humberside, Doncaster Sheffield and Leeds Bradford. The only notable air freight volumes are carried out of Newcastle Airport (5,482 tonnes in 2017) and Doncaster Sheffield (8,657 tonnes in 2017). Newcastle Airport recorded 20% growth in freight volumes in 2017, whereas Doncaster Sheffield's freight volumes fell by 7% in 2017 but there are plans for growth in air freight within their vision plan. Newcastle's long-haul route (Emirates to Dubai) has recently increased freight volumes significantly.

3.165 Increasing the opportunities for freight to be shipped via northern airports could contribute to traffic reductions on north-south routes as well as increasing competitiveness.

3.166 Where modal shift from road to rail may not currently be seen as economically viable, there is the opportunity to create the right conditions for a paradigm shift in the way that freight is viewed in the North. To achieve this, freight routes must be direct and not circuitous which is a significant constraint at present. Freight routes and paths must be planned alongside passenger rail not as an afterthought.

[63] Source: TfN Enhanced Freight and Logistics Analysis, January 2018

Supporting the Built/Natural Environment

Current Scenario

3.167 Poor air quality impacts parts of the SDC, particularly within the urban areas of Yorkshire and Tyneside. Currently 70 Air Quality Management Areas (AQMAs) have been declared in the Corridor. These AQMAs are predominantly localised extents covering specific junctions or road sections, although also include larger extents, such as Sheffield Citywide AQMA.

3.168 The transportation sector accounts for 24 percent of the UK's greenhouse gas emissions. In October 2017 the Government published 'The Clean Growth Strategy'. This includes measures to accelerate the shift to low carbon transport.

3.169 The East Coast to Scotland corridor includes 120 different National Character Areas (NCA) within England and Scotland. Designated high value landscapes within the East Coast to Scotland corridor includes four National Parks, five Areas of Outstanding Natural Beauty (AONB) and two Heritage Coasts.

3.170 The corridor also includes high value heritage assets such as Hadrian's Wall, Durham Castle and Cathedral and Studley Royal Park. Numerous other designated and non-designated heritage assets are located within the corridor. Large numbers of sites designated for nature conservation at the European, national and local level are located within the corridor. Many of these are located within the designated landscapes on the periphery of the corridor, although many high value nature conservation sites also fall within the central corridor in proximity to existing transport infrastructure.

Future Opportunities

3.171 Promoting and supporting the natural environment and built environment with respect to sustainable travel options associated with the major transport networks will be a key opportunity and necessity of future transport initiatives. This is also a key objective in the TfN STP. This will include making best use of existing transport infrastructure before investing in new capacity; and ensuring that new infrastructure is designed to minimise the negative impacts on both the natural and built environment

3.172 Additionally, reducing the impact of transport on local communities and environmentally sensitive areas will be become a priority to ensure high levels of quality of life and a healthy ecosystem.

3.173 While transportation contributes to substantial socioeconomic benefits, transport is also heavily impacting environmental systems. Congestion, noise pollution and air pollutants have been increasingly monitored (several Air Quality Management Areas have been established in the UK and identified as a serious threat to quality of life and local ecosystems. The North has experienced an increase in severance, noise and visual impact of rail.

3.174 Poorly located or designed transport infrastructure has the potential to degrade landscape character and visual amenity, and have adverse impacts

on biodiversity, the historic environment and water environment. Where possible, schemes should avoid sensitive areas, and where this is not feasible, measures should be implemented to mitigate any negative impacts. An assessment of environmental impacts would be required as schemes are developed further.

4 The Need for Intervention

Introduction

4.1 The Need for Intervention builds on the Case for Change set out in Chapter 3. It focusses on the problems and opportunities identified as being key to the unlocking of transformational growth. It firstly shows why investment is needed beyond the interventions assumed to be delivered in the Reference Case. It then identifies why TfN is the appropriate promoter for the additional infrastructure investment required and what objectives, subordinate to TfN's STP[64] objectives, TfN aims to achieve with a programme of investment in the East Coast – Scotland SDC.

Why further investment is needed

4.2 Across the North there are both physical (such as highway connectivity, journey times and reliability) and economic barriers restricting trade and business interactions. These barriers limit clustering of businesses, i.e. agglomeration economies, causing under-utilisation of the potential knowledge/innovation spill-overs resulting from improved efficiencies. When the transformational growth is factored in, synergies between road and rail will be critical to addressing these challenges and opportunities, as will an understanding of how transport demands will change in the future.

4.3 In a 'transformed future' scenario, the Northern economy would become more productive partly through increasing the skills of its workforce and lowering levels of economic inactivity - both these factors are associated with an increased propensity to travel. All other things being equal, increased productivity would therefore be expected to lead to marked changes in both the travel patterns of individuals and aggregate patterns across the entire North.

4.4 Under the transformational scenario, growth is expected in high and medium-skilled occupations (an increase of 35,300 and 1,600 jobs per annum by 2050 respectively), while jobs in low-skilled occupations are expected to stabilise from 2030 after a decline since 2015. In a transformed North, by 2050:

- total demand for rail travel is expected to be up to four times higher than today, to around 760 million trips.
- total demand for road travel is forecast to increase by up to 54% by 2050, to around 193 billion vehicle km travelled.

4.5 The major transformational infrastructure projects included in the Reference Case (including HS2, Northern Powerhouse Rail, Northern Trans-Pennine Routes, Trans Pennine Tunnel & Wider Transport Connectivity Assessment and Manchester North-West Quadrant), are focussed on delivering improved connectivity between the North's city regions. A significant

[64] Provided in the Regional Policy Section of this report (SPOC January 2019)

proportion of the growth catalysed by these projects will therefore be focussed on major towns and cities. To achieve transformational growth across all parts of the North, not just in the large urban conurbations, and realise the necessary rebalancing of the northern and UK economies will require further transport intervention.

4.6 Building on these foundations, the SDCs represent an economic area where the evidence to date indicates most progress towards the transformational growth scenario would be made by bringing forward Pan-Northern road and rail investment over the lifetime of the STP, with investment in all corridors critical in achieving TfN's and Partners collective ambitions.

Why TfN is the appropriate promoter

4.7 TfN's remit is focused on the identification and recommendation of strategic transport interventions (set out in its STP), which generally support longer distance trips and have a pan-northern impact. TfN will also work with partners to support complementary investment at a local level to ensure that a 'whole journey' and 'total network' approach to improving transport is followed.

4.8 There is no other authority or organisation with a remit that would make them an appropriate alternative; which is not to say that Highways England and Network Rail, which come closest, would not have a role in delivering interventions.

The sub-objectives of the SDCs

4.9 Subordinate to the four objectives set out in the STP, a set of sub objectives were set at the SDC level, to ensure that TfN's aims for investment are achieved. These sub objectives were developed in consultation with stakeholders, including one to ones with industry, to support both the STP's objectives and the aspirations for Pan-Northern interventions. Sub objectives underwent a rigorous process of approvals including Transport Appraisal Guidance (TAG) and SDC Project and Programme Boards.

4.10 These sub objectives are set out in the following Table 4.1: together with their performance measures.

Table 4.1: SDC Sub-objectives

STP Objectives	Sub Objectives	SDC Performance Measures
Transforming the economic performance	Improving productivity across the North	Does the scheme improve the connectivity for people and/ or goods?
	Improving links between the North's ports, airports, and strategic transport interchanges and the major transport networks for people and goods	
	Supporting, informing and influencing present and future land-use development in the North	Does the scheme improve accessibility to [any of] the North's four prime capabilities?
Increase efficiency, reliability, integration and resilience in the transport system	Improving efficient operational performance of existing major transport networks	Does the scheme improve the throughput of existing transport networks?
	Increasing the capacity and capability of the major transport networks for people and goods	
	Improving the reliability of the major transport networks for strategic transport movements of people and goods	Does the scheme improve the predictability of journey times?
	Improving travel choices and user experience for the movement of people and goods across the North	Does the scheme improve customer/ driver experience including via increased choice?
	Increasing the resilience of major transport networks	Does the scheme improve the resilience/ recovery of major transport networks?
Promote and enhance the built, historic and natural environment	Improving sustainable travel options and making best use of the North's existing major transport network. Supporting the reduction of transport-related Greenhouse Gas (GHG) emissions and improvement of air quality across the major transport networks	Does the scheme increase use of sustainable travel options associated with the major transport networks and reduced transport-related emissions (CO2, NOX, PM)?
	Reducing the impact of transport on local communities and environmentally sensitive areas	Does the scheme reduce the impact of transport in environmentally sensitive areas?
		Does the scheme reduce the impact of transport on local communities?

STP Objectives	Sub Objectives	SDC Performance Measures
Improve inclusivity, health, and access to opportunities for all	Supporting the delivery of Transformational Infrastructure and employment projects	Does the scheme improve access to economic assets of National of Pan-Northern significance?
	Supporting and enhancing the visitor economy	Does the scheme improve access to major tourist destinations?
	Supporting and enabling the delivery of strategic housing sites	Does the scheme improve integration with local transport networks?
	Supporting an affordable inclusive transport network with enhanced access to key opportunities, education and skills.	
	Improving integration and coordination with local transport networks	

5 Wider Context

Introduction

5.1 This section summarises the wider context of the proposed programme of interventions for the East Coast corridor. By outlining the programme's delivery constraints, as well as interdependencies with other implemented or planned projects as well as wider stakeholder needs and views, this section aims to provide a bigger picture with regards to the ease of implementation, its relation to other projects and the wider public opinion.

Delivery Constraints and Opportunities

5.2 A number of specific and more general constraints have been identified that may affect the delivery of the programme.

Transport Model Limitations

5.3 The future travel market scenarios available for use in the transport modelling are as follows:

- National Trip End Model (NTEM)[65] Core – in line with WebTAG guidance;
- NTEM Core with spatial plans and TEMPRO constrained at Local Enterprise Partnership (LEP) level;

[65] The National Trip End Model forecasts the growth in trip-origin destinations (or productions / attractions) up to 2051 for use in transport modelling. The forecasts accounts for national projections in population, employment, housing, car ownership and trip rate. The analyst is able to vary these forecasts to take into more granular data at a local level, such as from local plans or local industrial strategies, by constraining growth at lower spatial scales.

- NTEM Core with IER land use uplift, constrained at LEP level; and
- Northern Transport Demand Model (NTDM) derived transformational high growth.

5.4 The models developed are explained further in the Economic Dimension.

5.5 Transport modelling has focussed on the NTEM Core scenario during this stage of work. Plans are currently being made to resolve technical issues experienced with additional scenarios through follow-on commissions.

5.6 Notwithstanding, the NTEM Core scenario represents a lower travel market than TfN's transformational growth demand forecasts in terms of volume of movements and can therefore be seen as a conservative representation of the benefit to cost ratio (BCR) for a given intervention /programme of interventions.

Interdependencies

Reference Case

5.7 As set out in the reference case definition, the basis against which the programme of interventions in the East Coast - Scotland SDC is assessed includes some improvements which are not yet committed. Therefore, the basis of the assessment and conclusions reached in this SPOC are dependent on implementation of the reference case. That is not to say the programme does not have benefits in its own right, however this has not been examined as part of this stage of work.

Major Transformational Infrastructure Projects

5.8 Part of the rationale for the SDCs is to build on and extend the benefits of other significant investments in TfN's wider programme. Schemes such as NPR would benefit from the implementation of the proposed programme of interventions. As the major transformational infrastructure projects and SDC projects target the improvement of inter-city transport links, it can be expected that complementary benefits can be achieved. Furthermore, as HS2 is expected to function as an additional catalyst for NPR[66], the integration of both projects with the proposed programme of SDC interventions will have additional complementary benefits. That is not to say the programme does not have benefits in its own right; however, this has not been examined as part of this stage of work.

5.9 An overarching programme perspective is required to ensure the view of these complementary benefits is retained as various packages and interventions move forward in the delivery process.

[66] Global Railway Review (2018) https://www.globalrailwayreview.com/news/67419/hs2-npr-ambitions-greater-manchester/

Wider Policy Context

5.10 The proposed programme of interventions is not only closely aligned with key national, regional and local policies, but it is also expected that these policies are interdependent with regional interventions as suggested here. Notably, the programme of interventions will also lead to strong complementary benefits for non-transport policies.

5.11 Key national non-transport policies and strategies such as the UK Industrial Strategy or the Making our Economy Work for Everyone report[67], also identified the need for investing in strategic infrastructure to improve the country's productivity and increase economic growth and overall wellbeing. As a result, it is expected that the proposed programme of interventions will play a central complementary role for achieving the objectives of these strategies.

5.12 The NPIER identified poor connectivity and transport as one of the factors driving the productivity gap in the North. Forecasts anticipated that a 'transformed' North, where there were improvements to transport connectivity, as well as the skills base and innovation, would lead to an additional 850,000 jobs, 4% Increase in productivity and a GVA 15% higher than a business as usual scenario.

Business Case and Funding Approval

5.13 The costs associated with the development and construction of the programme are significant and the programme is currently in the early stages of business case development. To secure any government funding toward the scheme the DfT's Transport Business Case process will need to be adhered to. This SPOC is the first step, followed by:

- Strategic Outline Business Case (SOBC) development and approval
- Outline Business Case (OBC) development and approval
- Full Business Case (FBC) development and approval

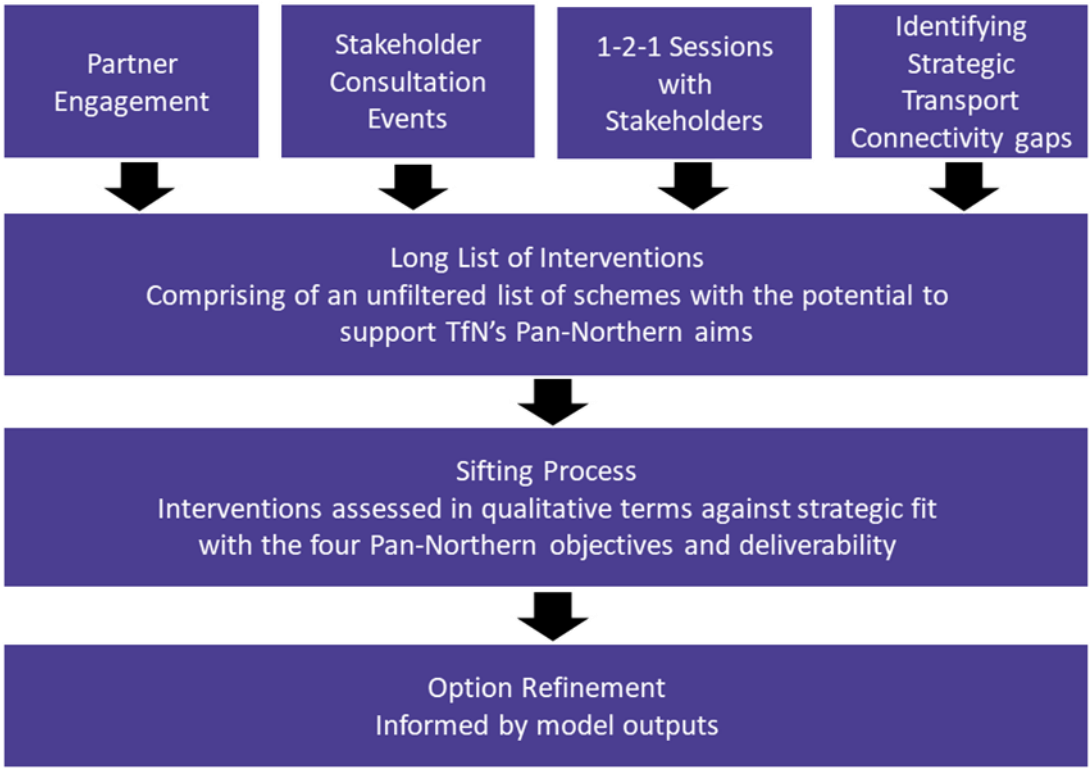
[67] ibid

6 Option Assessment Process

Introduction to Highway Options Assessment

6.1 A staged approach has been taken to the identification of Pan-Northern Highway interventions in the corridor as shown in Figure 6.1.

Figure 6.1: Staged Approach to Pan-Northern transport scheme identification



Introduction to Rail Options Assessment

6.2 TfN have undertaken a staged approach to allow the identification of 'Pan-Northern' Rail interventions in both the East Coast - Scotland and West Coast - Sheffield City Region SDC study areas. This has included:

- Partner Engagement
- Workshops to identify strategic transport issues across the corridors and
- Liaison with other longer-term studies (High Speed 2, Northern Powerhouse Rail, other SDC studies and Scottish Borders)

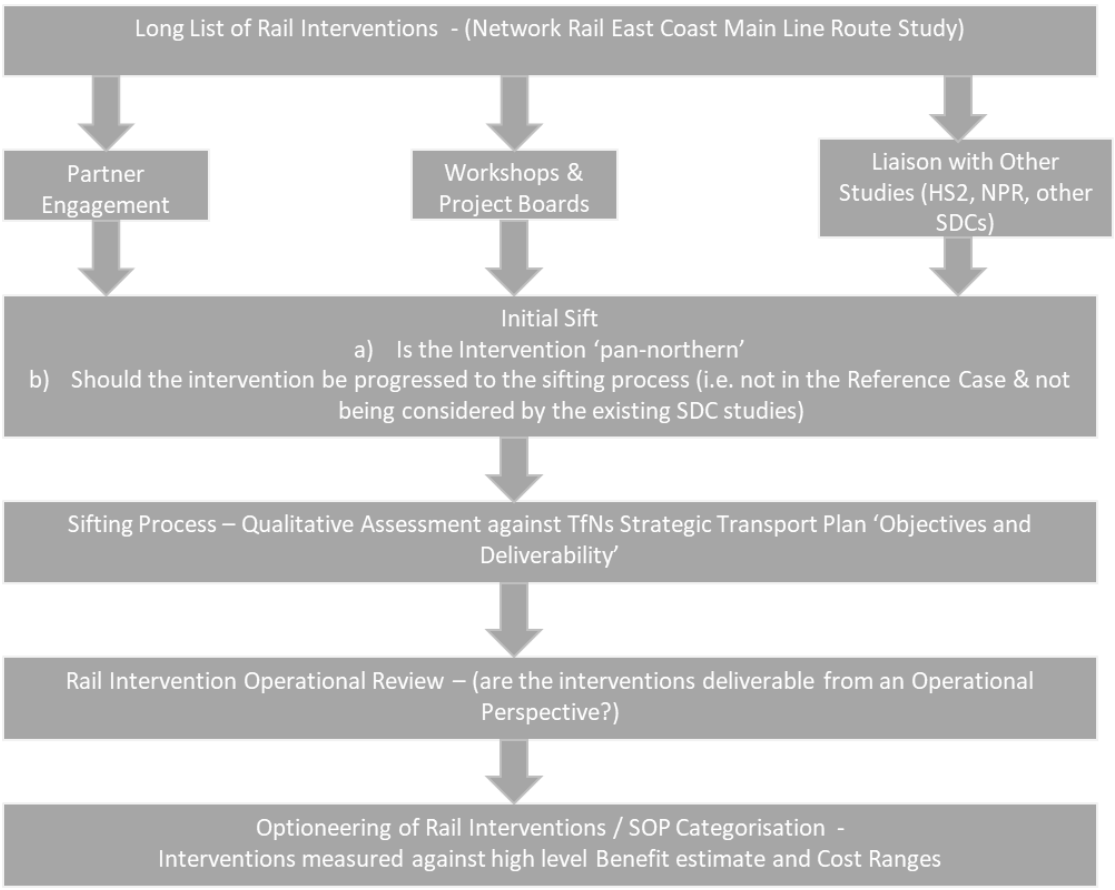
6.3 The East Coast - Scotland Rail Corridor builds on work done by Network Rail to develop the *East Coast Main Line Route Study: Railway Investment Choices* published in June 2018. This aims to provide a rail industry view of what the investment needs on the East Coast Main Line and parallel routes are over a 30 year horizon. The route study presents a series of "Choices for Funders" which are investment programmes and schemes identified. The Route Study is consistent with the work done for Northern Powerhouse Rail and HS2, recognising that the ECML forms parts of these networks in

the Sheffield – Hull and Leeds – Newcastle NPR corridors, and north of Church Fenton it will be the route for HS2 trains to the North East.

6.4 Based on the Route Study, Network Rail has developed a Phased Timeline of Investments which sets out what it considers needs to be done on the ECML and parallel routes up to the introduction of NPR and HS2 in 2033. This timeline is equivalent to the OARs produced by other SDCs and has been derived from an extensive industry and public consultation process and is informed by substantial technical work similar to that outlined above. It is also consistent with the Investment Programme within the Strategic Transport Plan.

6.5 As a result of this process a 'long-list' of Rail Interventions were identified for consideration for the East Coast - Scotland SDC. This list was then subject to an 'initial Sift' which is based on a number of agreed criteria such as 'does the intervention meet the TfN Strategic Transport Plan Objectives', 'is it pan northern' and 'should the intervention be progressed to the sifting process (i.e. it isn't already considered as part of the reference case set of interventions and / or it has already been considered by an existing SDC study). Following this exercise, the refined list of rail interventions is progressed to the option assessment stage. This process is outlined in Figure 6.2 below.

Figure 6.2: Long list to option assessment process



Stakeholder Consultation

6.6 Two phases of stakeholder engagement events were conducted during the preparation of the option assessment process for the East Coast - Scotland SDC. The stakeholder engagement workshops focused on gathering intelligence around the issues most pertinent to the corridors and also sought to identify the strategic interventions that are required.

6.7 Phase 1 of the engagement was used to explain the SDC process and gave partners an opportunity to share problems and issues in the corridor and suggest potential interventions. These suggested interventions formed the long list of interventions which were subsequently assessed in the Option Assessment Report (OAR). Consultations took place in Warrington, Grimsby, Doncaster, Northallerton and Berwick from June 11th – 20th 2018. The workshops lasted for three hours at each location and included 58 attendees in total.

6.8 A wide range of issues were raised across the stakeholder events. However, there were a number of consistent themes that are summarised below:

- *Surface Access to Ports and Airports:* With a desire to support economic growth in their areas, stakeholders agreed that reliable access to local ports and airports was hugely important. There was concern that the infrastructure was lacking which resulted in road freight trips to ports in the South of England. The need to look at alternatives to traditional freight movements were discussed including the use of inland water ways and rail.
- *HS2 Connectivity:* It was widely recognised that there was a need to capitalise on the benefits that HS2 would bring to the corridor and ensure that the investment opportunities were maximised. Improved connectivity is required by road and rail to the proposed HS2 stations.
- *Trans Pennine links:* Capacity and reliability concerns were raised about existing trans Pennine links, both road and rail. It was widely accepted that the M62 was at capacity and was considered to be hindering economic growth. There was also notable discussion about poor links between South Yorkshire and Greater Manchester.
- *Clean Air:* Stakeholders were concerned about the clean air targets identified for Leeds and Manchester and the lack of new vehicle technology and infrastructure in place to facilitate.
- *Public Transport:* Stakeholders raised concerns about a lack of suitable alternatives to travel by car. As well as rail journey times, rail frequencies and reliability were identified as poor, especially between Manchester – Leeds, Manchester - Preston and Manchester – Sheffield. It was also noted that there was huge variation in frequencies across the corridors.

6.9 In addition to the above key themes raised in the engagement sessions, various table discussions at the workshops also helped to generate several issues across the East Coast corridor. These issues were used to further define the outcomes that these interventions would help address.

6.10 Further discussions were held with 'key industry representatives' who were offered a 1-2-1 telephone discussion. Ten interviews were conducted with those who took up the offer. These discussions focused on specific issues relevant to the stakeholder but echoed the themes from the workshops. Discussions advocated specific road or rail projects to enhance connectivity between different areas. Poor public transport connectivity to town fringes, employment centres, and airports was also frequently raised.

6.11 The Phase 2 stakeholder engagement for the corridor programme consisted of five briefings across both corridors in Scunthorpe, Sheffield, Leeds, Durham and Manchester. The objective of the briefings was to provide an update on the progress made so far, present the evidence and feedback gathered in Phase 1 and set out the high-level outcomes which have been identified for each corridor.

6.12 In total, 112 people attended the Phase 2 briefings. Phase 2 engagement was also used to report back on the type of interventions which had been shortlisted in the Option Assessment Report. It also gave partners an opportunity to ask questions about the process and find out about the next steps of the study.

6.13 Consultation events for the Draft STP were also undertaken in parallel and responses shared across the different TfN work streams.

6.14

Option identification and shortlisting

6.15 For each SDC, a process of identifying and shortlisting interventions with Pan-Northern impacts was carried out. The initial long list of interventions was developed through engagement with stakeholders, complemented by reviewing policies and scheme proposals within the study corridors. Sources included: Highways England's Road Investment Schemes, Network Rail's Enhancements Delivery Plan, TfN STP, Long Term Rail Strategy, Welsh Government's National Transport Finance Plan and local authority schemes. The longlisting exercise took account both of Pan-Northern outcomes, emerging policy and future technology developments.

6.16 Following creation of the longlist, a sifting process was undertaken considering each intervention's strategic fit with the four STP objectives and SDC sub objectives (as set out in Table 6.1:).

6.17 This was based on a qualitative appraisal of each transport input's likely contribution to the relevant performance measures and deliverability using a four-point scoring scale as set out in Table 6.1: and aided through application / reference to a set of metrics (covering the four-point scale) for each performance indicator.

Table 6.1: Assessment scoring scale

Performance Measure	Deliverability	Rating
A strong fit with the desired outcome with large beneficial and/or Pan-Northern or national scale impacts	Strongly deliverable	
A good/reasonable fit with the desired outcome with beneficial and/or sub-corridor level impacts	Likely to be some deliverability issues but are not considered to be insurmountable	
A neutral/marginal impact with the desire outcome and/or with local impacts	Not applicable	
Conflicts with the desired outcome and/or conflict with other interventions, with risk amelioration/mitigation in place	Significant barriers to deliverability that need to be overcome through risk amelioration	

6.18 The sifting tool also provides a 'performance rating' for each of the four STP objectives. This does not represent a summation or weighting of the individual performance indicator ratings ('scores'); but rather takes an informed risk-based view of how well/ poorly the potential intervention met the strategic objective when considered across the respective performance indicators.

6.19 In order to ensure a consistency of approach the sifting tool was subject to verification and moderation across all SDCs. The outcome of the initial sifting exercise was to classify potential interventions into one of three categories:

- **Potential Core SOP Intervention:** An intervention that has the potential to support transformation improvement, measured against the four Strategic Plan objectives, in its own right
- **Potential Complementary SOP Intervention:** An intervention that as part of a package of interventions that together have the potential to support transformational improvement (but is not Pan-Northern in its own right). Sequenced delivery could mean that complementary interventions come earlier, they could be the quicker wins.
- **Non-Pan Northern Intervention:** An intervention that would only have limited benefits as part of a package of interventions but may have local benefits

6.20 All STP objectives have been treated with equal importance. Interventions that have the potential to strongly support one or more of the STP objectives may be considered a potential core intervention as part of a balanced SOP for the SDC as a whole. It is fully recognised that some potential interventions are likely to face barriers to deliverability and these challenges will need to be overcome as part of the scheme development process.

Option refinement

6.21 Phase 1 of this study concluded with an Option Assessment Report (OAR) and an initial sifted list of interventions, representing a draft SOP. This draft SOP was appropriately coded into the regional highway and rail models for more detailed appraisal, refinement and package optimisation.

6.22 It was the intention to base the optioneering process on a transformational travel market, derived from the NTDM but as described previously this has not been possible owing to technical difficulties encountered during this stage of work.

6.23 Due to the reliance on a NTEM core demand scenario only it has been necessary categorise SOP interventions for each SDC in the following manner:

- interventions that have a strong strategic case and are supported by the NTEM model outputs;
- interventions that have a strong strategic case but are not adequately represented by the NTEM Core travel market scenario and requiring further development and analysis.

6.24 The option refinement process also removed a number of potential interventions where the transport need was met by better performing alternative interventions or the intervention is not expected to make any meaningful contribution to the desired Pan-Northern transport outcomes.

Key Pan-Northern Transport Outcomes and Programme of Interventions

6.25 A final strategic outline programme (SOP) of interventions for the East Coast – Scotland SDC has been defined and is presented below in Table 6.2 for both road and rail, and shown graphically in Figure 6.3 to Figure 6.5. The Highway SOP proposals alongside the relevant Reference Case interventions are set against the key Pan-Northern outcomes within the Corridor. While all the Rail SOP proposals across the Pan-Northern Strategic Development Corridors have been shown in Figure 6.7. Figure 6.7 presents the rail Reference Case interventions across the Pan-Northern SDCs.

6.26 The transport interventions shown are indicative at this stage. They are based on the level of evidence currently available at this very early stage of assessment. For many of the Reference Case schemes there remains a critical requirement to continue with the development of cases and to secure funding and TfN will work with partners to try and achieve that. It should also be pointed out that many of these interventions require further development and a positive funding decision before they can be delivered.

6.27 Delivery of these draft transport interventions should not be relied upon for planning and development purposes.

6.28 The SOP interventions in this table are in addition to (and in some cases the same as) other SOP interventions already identified in TfN's Investment Programme and earlier SDC SPOCs. These additional schemes are detailed within the other SDC SPOCs. Further potential rail interventions being

promoted by partners within the East Coast - Scotland study area fall outside the scope defined for this study. These include high speed links from Newcastle to Scotland, improvements for commuter flows into Newcastle, and improved connectivity from Sunderland to the East Coast Main Line. These interventions will be considered in the next stage of SDC development in line with the Investment Programme.

Table 6.2: Strategic Outline Programme of Interventions

Pan Northern Outcomes	Status	Road	Rail/ Public Transport
Improve connectivity and resilience to Tyne and Wear, Durham and Edinburgh from the A1(M) / A19 Corridors	SDC Reference Case	A1 North of Ellingham; A1 Morpeth to Ellingham Dualling; Expansion of Tyne and Wear's Urban Traffic Management and Control (UTMC) Services (HIF Bid); A1 Birtley to Coal House; A1 Scotswood to North Brunton; A19/A1058 Coast Road junction improvement; A19 Testos and Downhill Lane junction improvements; A19/A194 and A19/A185 Lane gain/drop arrangement; A19 Moor Farm Junction Improvements; A185/A194/A19 Traffic Movements (The Arches Junction); A19/A182 Junction Improvements; A1/A19 Technology Improvements; Ponteland Road corridor; Durham Relief Road	
	SDC SOP intervention	A1 dualling and capacity improvements in the North East; Improved access to the International Advanced Manufacturing Park and improvements to the A19/A690 junction; A1068 improvements; A1 improvements (south of Blyth); Durham Relief Road	
Improve connectivity and resilience to Tees Valley from the A1(M) / A19 Corridors	SDC Reference Case	A66 Darlington Northern Link Road; Cargo Fleet Roundabout Capacity Improvements; A1(M) J59 Junction Capacity Improvements; A171 Swans Corner to Flatts Lane Improvement; A19 Norton to Wynyard; Darlington Growth and Enterprise Zone Connectivity; New Tees Crossing: Viaduct Option	East Coast Main Line power supply upgrade; Horden Peterlee station; Sheffield-ECML electrification
Improve the connectivity and resilience of key links between functional economic	SDC Reference Case	A66 Scotch Corner to Greta Bridge Dualling	

centres within the East Coast to Scotland SDC			
Improve access to International Gateways - Newcastle Airport, Port of Blyth, Port of Sunderland, Port of Tyne, Port of Seaham, Port of Tees, Leeds Bradford International Airport, Ports on the Humber, Doncaster Sheffield Airport	SDC Reference Case	Blyth Relief Road; Northern Gateway - Two Way Traffic Dame Dorothy Street; Sunderland Strategic Transport Corridor, Stage 3 - Dual Carriageway new Wear Crossing and St Mary's Roundabout; A63 Castle Street; A63 Garrison Road Roundabout	W12 gauge clearance between Port of Immingham and Doncaster; Freight enhancements Northallerton-Eaglescliffe/Teesport
	SDC SOP intervention	New strategic river crossing capacity of the River Tyne	
Improve connectivity and resilience to within North Yorkshire, Leeds City Region and York from the A1(M) / A19 Corridors	Reference Case	A1 Leeming to Barton improvement; A1237 York Northern Outer Ring Road Roundabout Improvements; A1237/ A64 Hopgrove Junction Improvement and A64 Dualling (Hopgrove to Barton Hill); M621 J1-7 Improvements	
	SDC SOP intervention	A19 improvements (online and junction improvements and gap closures); Safety and technology improvements	Doncaster – Leeds capacity improvements
Improve accessibility at key transport Interchanges	SDC Reference Case	A1(M) / A59 Junction 47 Improvement	
Improve access and connectivity to Growth Zones	SDC Reference Case	Holborn Strategic Transport Improvements; Doxford Park Ryhope Link Road South / Sunderland Growth Area Access Route; Local Junction Improvements to Support Great Park and Outer West developments; East Leeds Orbital Route; M1 Junction 45 Improvement & Temple Green Park-and-Ride; A19/A179 Sheraton; Aire Valley Expansion; M18 J3 improvement; Stainton Way Western Extension - New distributor road linking the A1130 and the B1380 to the west of Acklam; A19/A1130 Mandale Interchange	

		Improvements - Partial signalisation of interchange; B1380 Low Lane/Stainton - Way Junction Improvements - Partial signalisation of existing roundabout; Stainton Way Widening and Junction Improvements; B1365 Hemlington Lane Widening/Newham Way Widening and Junction Improvements; Longlands to Ladgate Lane Link Road; A172 Dixons Bank/Stainton Way Improvements; A172/A174 Stokesley Road Interchange Improvements; A168 / B1448 scheme for the slip road at Thirsk	
	SDC SOP intervention	North East port and Newcastle International Airport highway and rail access improvements;	
Improve connectivity and resilience to the Humber, Lincolnshire and Doncaster from the M1 and A1 (M) Corridors	SDC Reference Case	A1079 Roundabout Improvements at Killingwoldgraves & Shiptonthorpe; A164 & A164/ A1079 Jocks Lodge Junction Improvement Scheme; A1 Redhouse to Darrington; A1 Doncaster Bypass; Warmsworth Dualling	
Provision of high speed rail services across the North to the rest of the UK, radically reducing journey times and providing enhanced connectivity beyond the HS2 network & Ensuring the North is ready for HS2 to maximise the benefits of this nationally significant project	SDC Reference Case		HS2 Phases 1, 2a and 2b including all station works to accommodate services

Enhancing connectivity between the North's largest economic centres, with faster more frequent services, to build on HS2	SDC Reference Case		Transpennine Route Upgrade (including intermediate interventions); Northern Powerhouse Rail programme; Interventions at the major hubs necessary to realise the benefits of improved connectivity along the NPR corridors, including in this SDC: York and the Leeds Station Masterplans
	SDC SOP intervention		East Coast Main Line journey time and reliability improvements to address known issues on the route; York – Newcastle improvements to existing ECML to make best use of IEP trains
Improve accessibility at key transport Interchanges	SDC Reference Case		Northern Powerhouse Rail programme; Interventions at the major hubs necessary to realise the benefits of improved connectivity along the NPR corridors, including in this SDC: York and the Leeds Station Masterplans; Committed service frequency and rolling stock enhancements via Northern, TransPennine Express and East Midlands rail franchises
	SDC Reference Case		Newcastle Station including platform lengthening; Doncaster Station remodelling to reduce conflicts

Figure 6.3: East Coast – Scotland SDC Road Reference Case and SOP Proposals

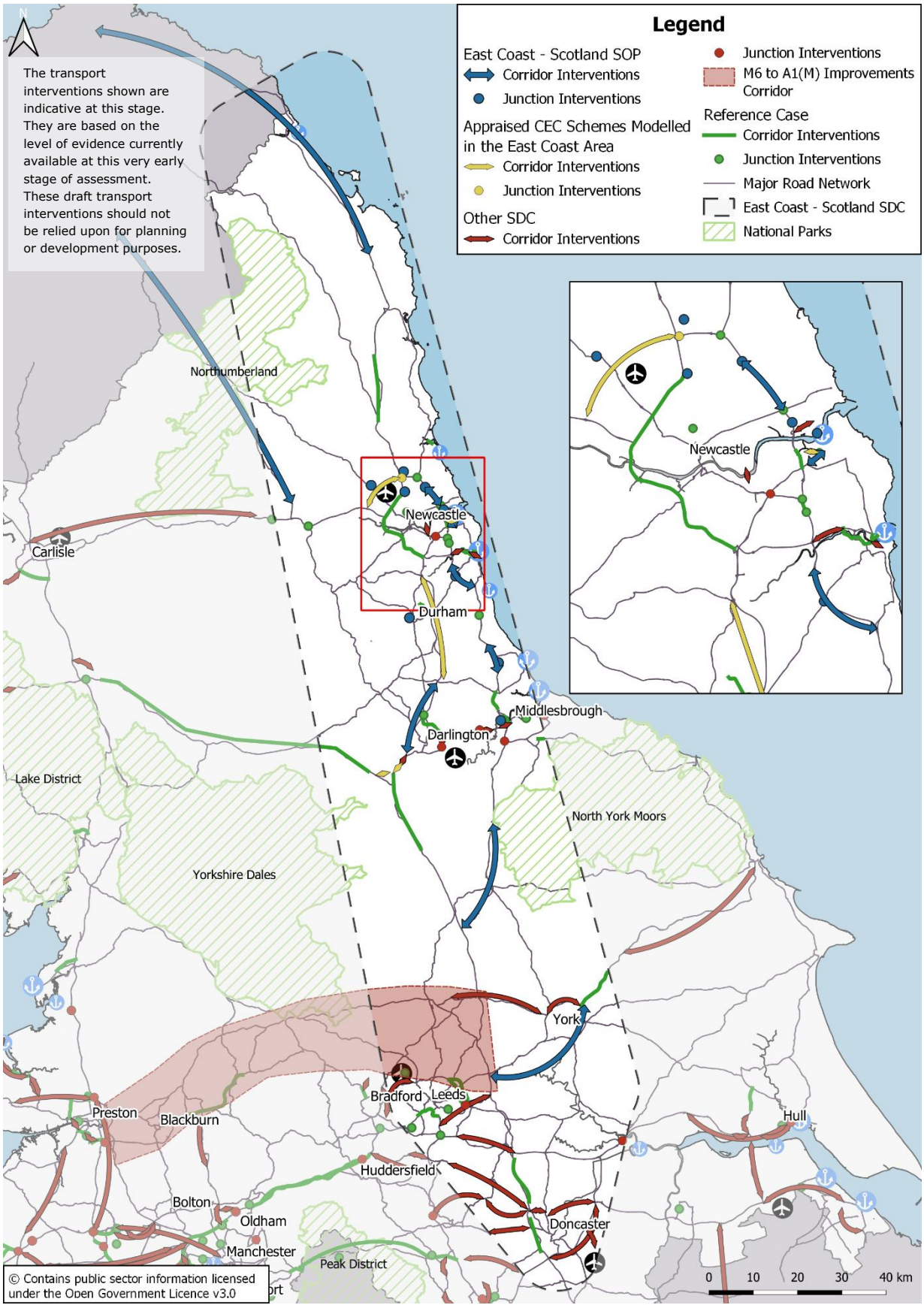


Figure 6.4: East Coast – Scotland SDC Rail SOP Proposals

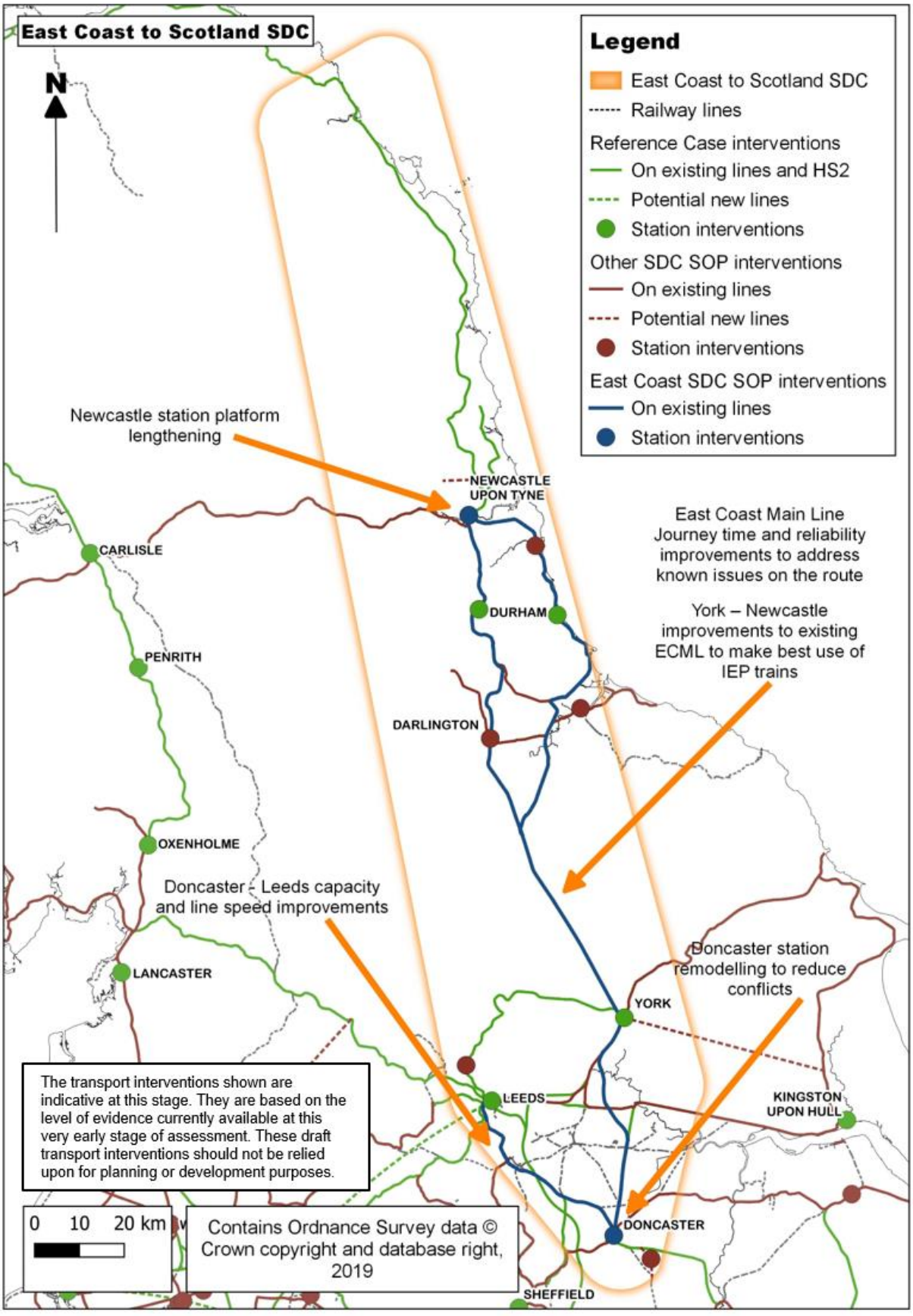


Figure 6.5: East Coast - Scotland Rail SOP Proposals

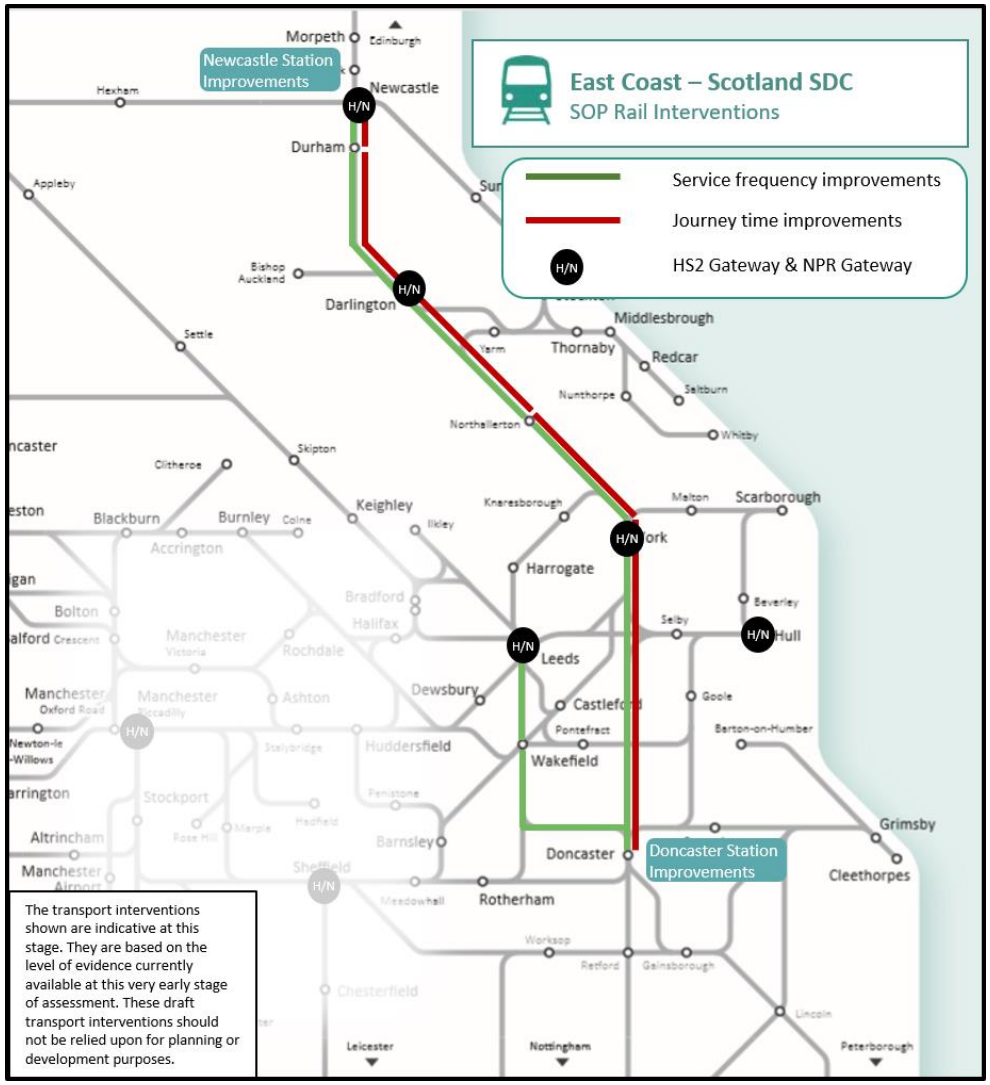


Figure 6.6: Rail SOP proposals across the Pan-Northern Strategic Development Corridors

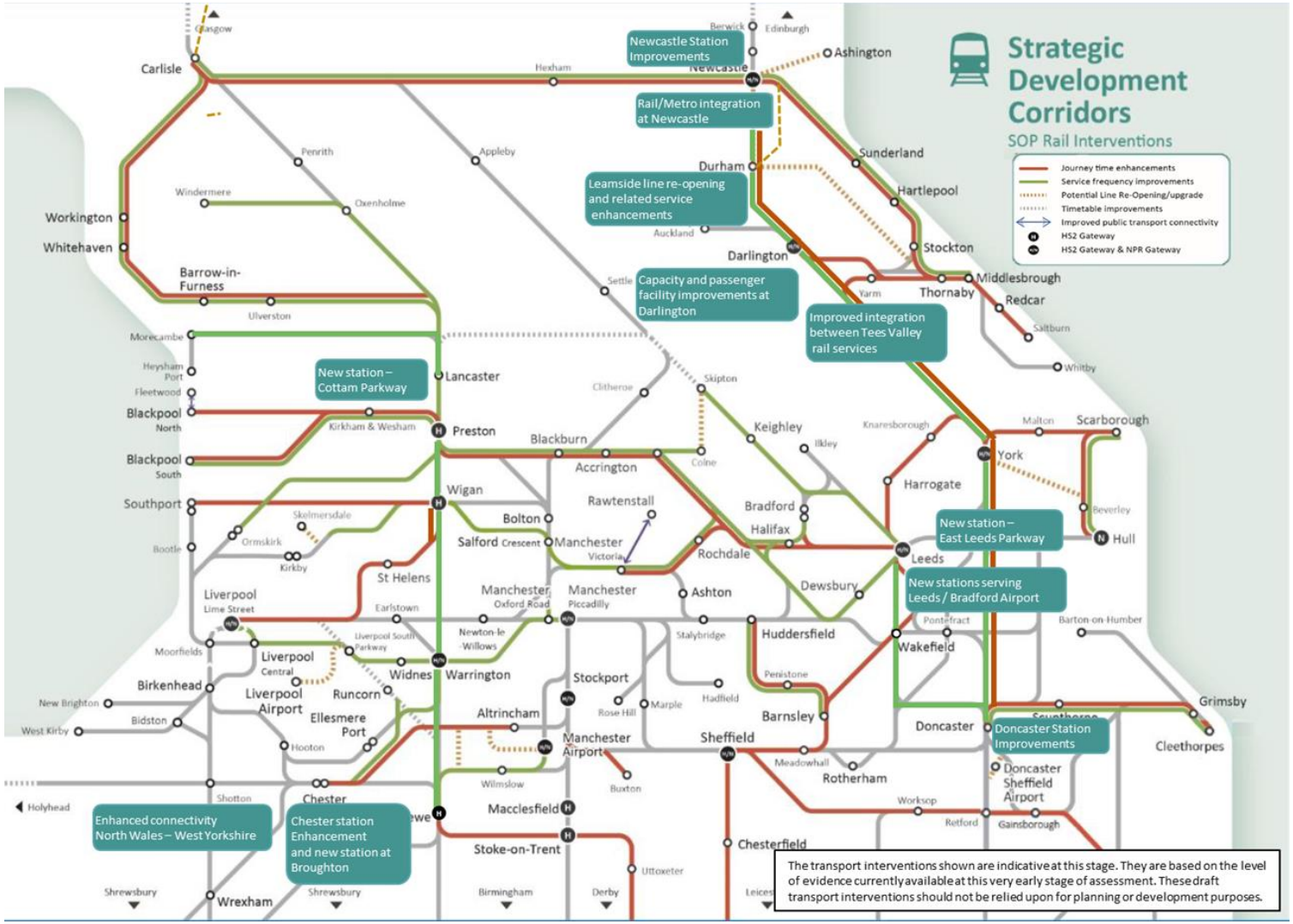
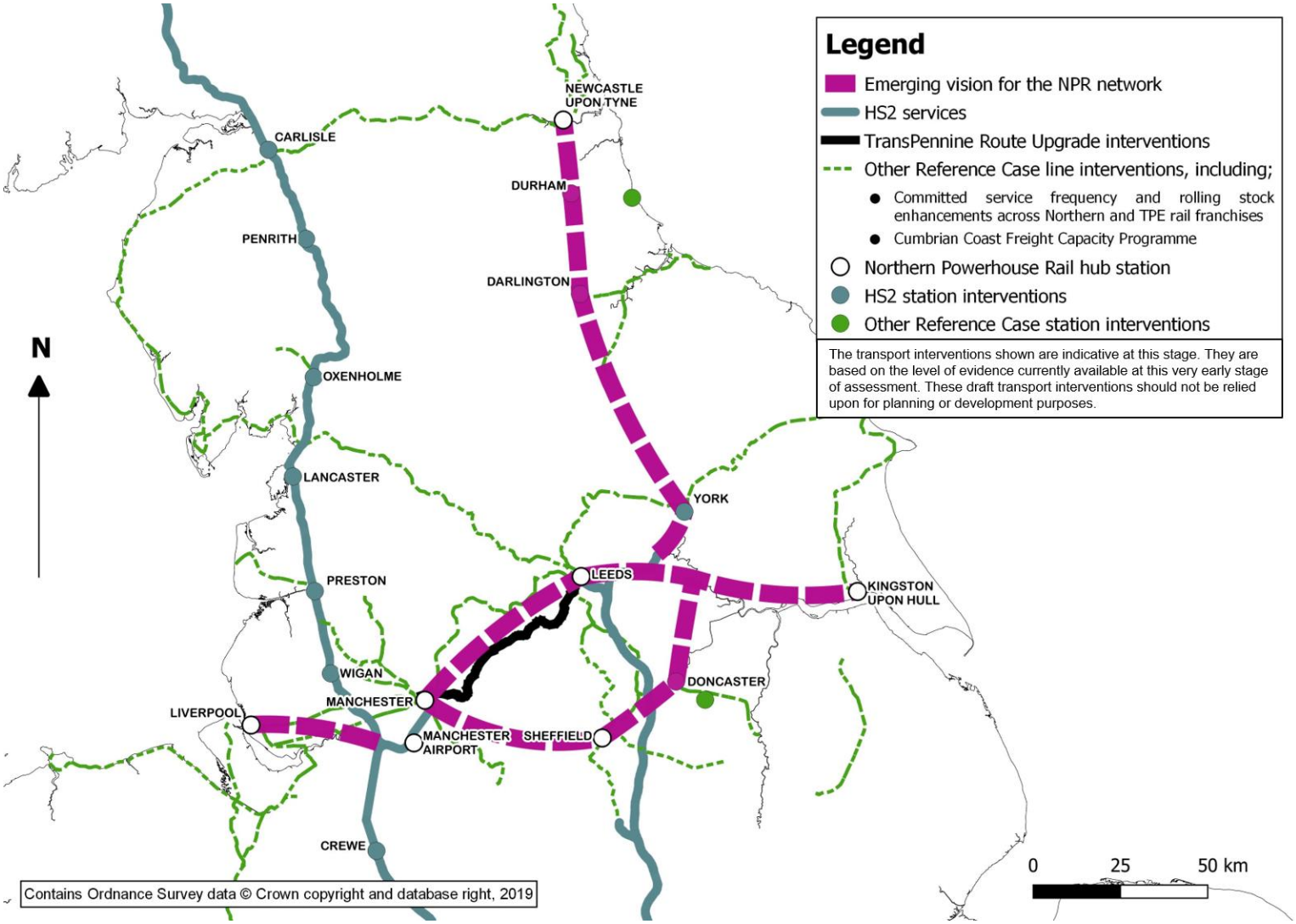


Figure 6.7: Rail Reference Case Interventions across the Pan-Northern Strategic Development Corridors



Multi modal interface

6.29 The interventions for road and rail have been developed from the perspective of promoting opportunities for integration between modes and maximising the reach of transformational infrastructure (such as HS2, NPR and International Airports) through strategically placed interface points with the MRN. They have also been considered from the perspective of forecast economic growth, and the means to which connectivity can be improved between residential and employment areas.

Anticipated impacts of the programme

6.30 As outlined in chapter 3, the economic performance of the East Coast – Scotland SDC suffers from several economic shortcomings and has been experiencing a significant performance gap with the rest of the UK. Low levels of productivity, poor connectivity and low levels of agglomeration have caused an under developed economy with respect to the UK's national performance. The implementation of the identified programme of interventions will lead to several wide-ranging impacts that aim to tackle some of the economy's shortcomings and stimulate the overall economic development of the region.

Connectivity and economic development

6.31 Connectivity improvements aimed at fostering economic activity will have the most important anticipated impact. Several interventions aim to create better transport links to facilitate economic collaboration and competition as well as to provide a larger pool of employees and employers.

6.32 Critical North - South connectivity across the East Coast area is addressed by proposed major schemes such as the A1M Smart Motorway between Chester-le-Street and the A689, the A69-A696-A1 new link road around the north of Newcastle Airport and subsequent upgrade of the A19 Seaton Burn Junction. These schemes would provide increased capacity on existing routes and enable improved connectivity to Newcastle and Sunderland from areas to the west and south. The A1 dualling SOP intervention is a continuation of the Reference Case scheme and runs from Ellingham to the Scottish border north of Berwick. This would provide improved and reliable journey times on a key strategic route between Edinburgh and Newcastle. The combination of these four interventions provide a significant improvement to existing north-south movements while also improving accessibility and provide relief to surrounding routes.

6.33 A number of interventions on the A19 are proposed including two sections with an additional lane provided in both directions, one to the east of Newcastle between Killingworth and Silverlink junctions and the other running from Chester St and Seaton Lane Junctions. These provide additional capacity on this key corridor between areas north of Newcastle, Sunderland, Hartlepool and Middlesbrough. This subsequently provides some further relief to surrounding local routes and to some sections of the existing A1 running to the west of Newcastle.

6.34 There are also a number of local interventions included in the East Coast SOP. These include relief roads at Ponteland, Durham, Portrack along with a new junction and link connection to the A19 west of Hartlepool. These interventions provide localised benefits, alternative connections and relief to existing surrounding local routes. A new link connection between the A66 & A1M bypassing the junction at Scotch Corner provides relief to this existing junction. This intervention also provides improved connectivity between the section of the A66 west of the A1M to the section of the A66 east of the A1M towards Darlington via a lane gain/ lane drop on the A1M.

Constraints and Wider Considerations

6.35 While the proposed programme of interventions demonstrates strong potential and benefits with regards to an improved economic performance and opportunities across the North and increased efficiency and resilience of the transport system, the implementation of the programme would need to carefully consider potential environmental constraints.

6.36 Improved connectivity and increased road and rail activity might have negative impacts on transport-related greenhouse gases (GHGs), noise pollution, environmentally sensitive areas and local communities. Therefore, the lever 'conserve and enhance the built and natural environment' has played a central role in the sifting process of possible interventions.

6.37 While an overall reduction of transport-related greenhouse gases (GHGs) and noise pollution is difficult to achieve by increasing the number of transport links, the programme of interventions covers a set of strategic projects that collectively aim to reduce and limit the overall impact of transport on the environment and local communities. However, it is recommended that the impact on local communities, environmental constraints and the complexity of ecosystems needs to be carefully considered at every stage of scheme development.

6.38 It is noted that technology will play a significant role in the delivery of transport improvements across northern England up to 2050, based on the understanding that current levels of congestion (especially in the major city regions) is already reaching unsustainable levels for significant parts of the day, which cannot be addressed solely by adding capacity to the network.

6.39 TfN are committed to reviewing all interventions and investigating how they can be future proofed to accommodate development in technology (such as linked autonomous vehicles) within the context of developing the MRN. Equally, there may be schemes identified within the Investment Programme that are ultimately unnecessary as a result of being superseded by changing methods of addressing travel demand.

7 Strategic Dimension Summary

7.1 This chapter has set out the case for investing in the proposed programme of interventions in the East Coast – Scotland SDC. This includes addressing significant transport challenges not covered by interventions contained in the reference case.

7.2 To achieve transformational growth across all parts of the North (not just in the large urban conurbations) and realise the necessary rebalancing of the northern and UK economies, it will require further transport intervention.

7.3 The Option Assessment Process adopted as part of the East Coast - Scotland SDC has involved a transparent review of numerous interventions, which were assessed against agreed objectives to identify the preferred multi-modal package of interventions. This process involved two rounds of stakeholder consultation.

7.4 Alongside all the technical and financial considerations to be taken in relation to any proposed interventions, it was a key aim to minimise the impact of transport on the built and natural environment and the health and wellbeing of residents, workers and visitors in the North, and where possible to deliver enhancements.

7.5 Any early assessments made as part of the development of the Strategic Transport Plan are important steps in protecting and, where possible, enhancing the environment, health and wellbeing of the North. It is important to recognise that in the development of any intervention, further health and social aspects would need to be assessed at an appropriate level for that stage of the design or planning.

7.6 The identified package of interventions is closely aligned with the proposed programme of interventions within national, regional and local policies.

7.7 Results of the further analysis and evaluation of the list of interventions is presented in the following chapter, the Economic Dimension.

Economic Dimension

The focus of the Economic Dimension is demonstrating that the proposed package represents Value for Money to the UK as a whole, in that:

- It is a justified public sector intervention, with positive impacts outweighing costs and negative impacts
- A process of refinement has been undertaken, working towards a programme which represents the strongest option

8 Introduction

Background

8.1 The Economic Dimension sets out the approach taken to quantifying benefits and costs as part of the assessment, and also provides qualitative assessments of impacts which cannot be quantified at this stage of assessment.

8.2 The evidence-led process which led to the identification of a programme of interventions for the East Coast Strategic Development Corridor (SDC) is described in Chapter 5, within the Strategic Dimension of this Strategic Programme Outline Case (SPOC). The programme combines road and rail interventions of differing scales and delivery programmes, with beneficial outcomes to individuals and organisations within and beyond the SDC area.

8.3 The economic case concludes with a Value for Money (VfM) assessment which draws together the quantified and qualitative factors, the latter including consideration of the programme's alignment with Department for Transport (DfT) and Transport for the North (TfN) strategic objectives as set out in Table 4.1:. These matters will be combined with a consideration of strengths and limitations in the level of analysis at SPOC stage, to determine a VfM category for the programme.

8.4 The economic appraisal has followed the TfN assurance process which includes:

- TfN's Technical Assurance Group (TAG) Meetings - to agree the appraisal process with partners; (which for the East Coast - Scotland SDC have been combined with the Project Board meetings); and
- Technical Assurance 'deep dive' sessions to ensure that the appraisal outputs are robustly checked.

8.5 The level of appraisal and assurance undertaken is considered to be greater than what would normally be expected at Strategic Outline Business Case.

8.6 The appraisal is documented in detail in the following supporting documents:

- Combined Modelling & Appraisal Report (KP4, September 2019, this includes the Appraisal Summary Table)

- Environmental Appraisal Report (EnvAR) (KP5, August 2019)

Rationale for Investment

8.7 The appraisal will demonstrate that further investment is required above the reference case in order to achieve transformational growth. The current case is built upon National Trip End Model (NTEM) Core growth only. Transformational growth would generate a larger demand and greater benefits. However, transformational growth scenarios have not been assessed at this stage.

Approach to Value for Money Appraisal

8.8 The VfM appraisal of the East Coast - Scotland SDC Programme has been undertaken with reference to DfT's Transport Appraisal Guidance[68] (WebTAG) using the May 2018 databook. Although this databook has now been superseded, the May 2018 databook has been used to ensure consistency in the appraisal between SDCs. The appraisal methodology and scope was previously agreed at TAG and has been applied consistently across all SDCs. Unless stated otherwise monetised impacts within the Economic Dimension are presented in 2010 Gross Domestic Product (GDP) Deflator Real Market Prices discounted to 2010 present values[69], as specified by WebTAG.

8.9 The proportionate approach to the VfM appraisal of the East Coast - Scotland SDC Programme was set out in the Inception Report for the study. The Inception report sets out how the economic, environmental and operational assessments for the project would be undertaken, and how they would be supported by traffic modelling, whilst taking into consideration budgetary, programme, political, environmental and spatial constraints.

8.10 The Economic Dimension sets out the approach taken to forecasting the demand and economic impacts resulting from the programme of highway interventions within a modelling framework which represents the specific corridor. Passenger rail interventions, which in many cases have impacts which are not contained within the corridor boundaries, have been represented in a separate exercise resulting in the production of an Initial Integrated Rail Report. Similarly, the highway and rail freight impacts, which are UK-wide, have been separately represented. Changes in travel times and costs resulting from these wider interventions, have been included within the Reference Case for the highway intervention forecasts, to limit the potential double counting of their impacts. Results from the separate analyses are brought together within the VfM statement.

8.11 The demand and economic benefits forecasting for the programmes of interventions is based on 'business as usual' travel market growth in line

[68] https://www.gov.uk/guidance/transport-analysis-guidance-webtag

[69] For further details, see paragraph 10.1 onwards

with DfT's NTEM[70]. In contrast, the option identification and selection process was based on the assumption that the transformational economic growth identified in the Northern Powerhouse Independent Economic Review (NPIER) is achieved. On balance, TfN considers the constructed case to be more credible with lower demand growth and less uncertainty, than the alternative with transformational growth at this stage of development. TfN will assess transformational impacts in any further business case development using its Analytical Framework.

8.12 Accordingly, the forecast demand and economic benefits presented in this Economic Dimension considers only at this stage those interventions that have both a strong strategic case and are supported by the NTEM Core model outputs[71].

8.13 Table 8.1: and Table 8.2[72] below list the final Strategic Outline Programme (SOP) of road and rail interventions respectively that have been appraised at this very early stage of programme development for the East Coast - Scotland SDC, alongside those interventions that have a strong strategic case but are not adequately represented by the NoRMS modelling suite and/or the forecast growth matrices used for the study, and therefore require further development and analysis. TfN are further developing the Analytical Framework to facilitate improved appraisal of the Appraised and non-Appraised schemes and plan to progress further work on a northern level economic dimension for road and rail interventions in 2019/20. The distribution of the appraised schemes is illustrated in Figure 6.3 and

8.14 Figure 6.4 in Section 6.

[70] For the programmes of highway interventions, NTEM modal growth assumptions are adjusted for network conditions within the variable demand modelling approach applied. For rail intervention, equivalent adjustments are made to forecast rail mode share by application of the rail industry's Exogenous Demand Growth Estimation (EDGE) process.

[71] TfN is developing the transport modelling tools plan to take forward further analysis and appraisal of the Strategic Outline Programme of transport interventions, including economic appraisal of schemes not adequately represented by the NTEM Core travel market scenario.

[72] Table 9 includes all Pan-Northern rail interventions, not only those specific to the East Coast Corridor.

Table 8.1: Appraisal of Strategic Outline Programme of Road Interventions

Road Interventions Appraised within the Economic Dimension
• A1 North of Ellingham to the Berwick Dualling • A19 junction and on-line improvements between Killingworth interchange and Coast Road/ Silverlink interchange • A19/ A1056 Killingworth junction improvement • A19/ B1404 Seaton Lane to A19/ A183 Chester Road on-line improvement • A19 Gap closure at Elwick and new grade separated junction • Port of Tyne Connectivity – on-line improvement • Portrack Relief Road • Durham Western Relief Road • Ponteland Relief Road • Hartlepool Western Growth Corridor Appraised schemes included from the Connecting the Energy Coasts SOP: • A69-A696-A1 link to form a NW ring road of Newcastle • A66 to A1(M) new link and junction north of Scotch Corner • A1(M) Junction 60 to Chester-Le-Street Smart Motorway • A19 Seaton Burn Junction upgrade • A185 Port of Tyne – on-line improvement
Road Interventions Not Appraised within the Economic Dimension at this stage
• A68 and A7 SRN • A1(M) Barton to Chester-Le-Street Smart Motorway • A19-A193 Howdon interchange signalisation • Durham Road (A690)/ (A19) junction improvement • A1068 Fisher Lane – on-line improvement • A1 to A1056 East Corridor (including A1 improvements and Rotary Way) • A19-A1018 on-line improvement • A19/ A168 Expressway • A64 Technology improvements

The highway appraised SOP interventions are shown in Figure 8.1.

Figure 8.1: East Coast – Scotland SDC Road Reference Case and appraised SOP Proposals

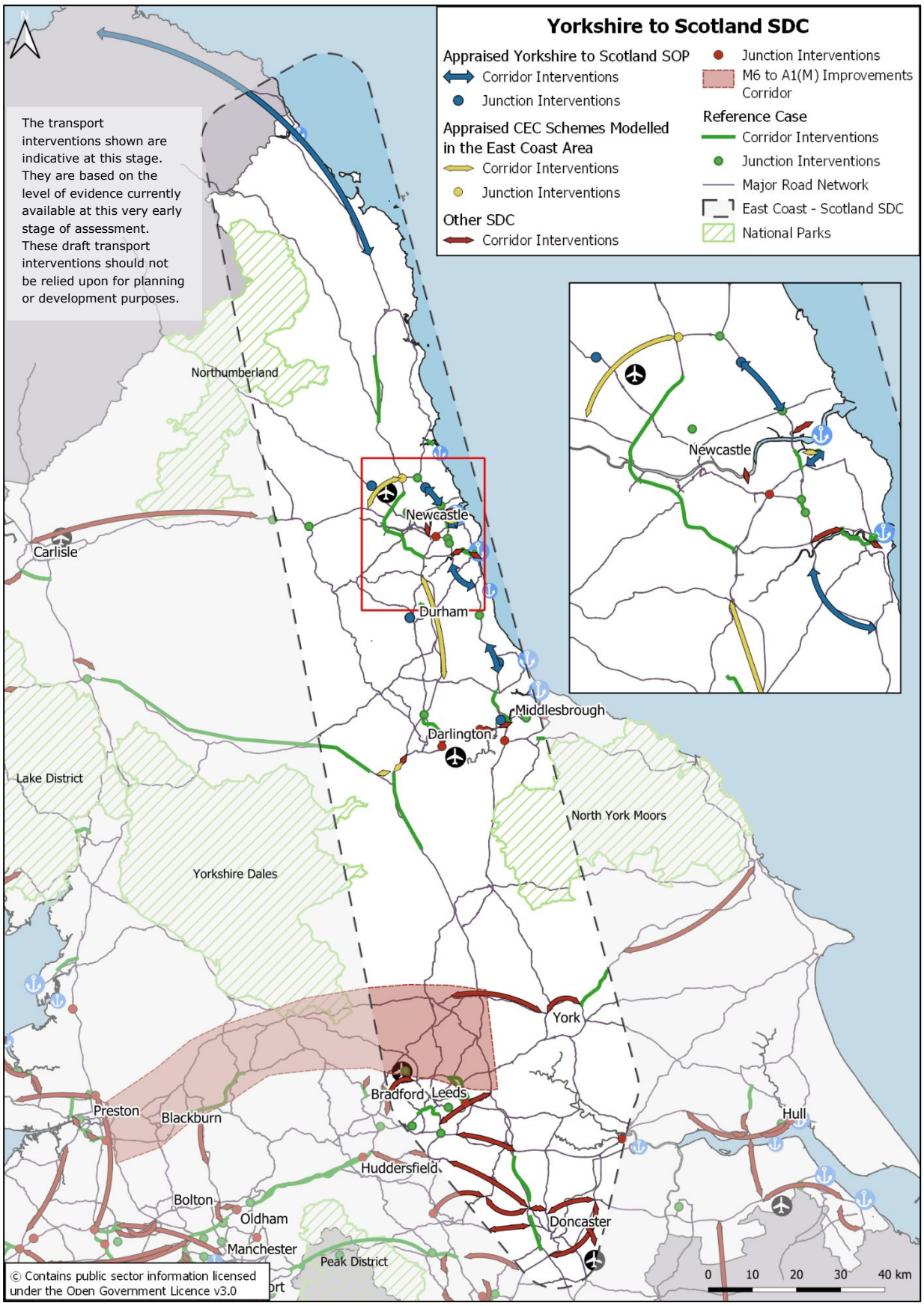


Table 8.2: Appraisal of Strategic Outline Programme of Pan- Northern Rail Interventions

Rail Interventions Appraised within the Economic Dimension
• Journey time improvements Preston to Blackpool North • Skelmersdale rail link • East Lancashire Line (journey time and capacity improvements) • Burnley to Manchester journey time and service improvements • Preston to York (journey time improvements) • Crewe – Stoke - Derby (journey time improvements) • Extension of North Staffordshire services to Nottingham and Manchester Airport • Manchester – Skelmersdale (via Wigan) service frequency enhancement • New stations at Droylsden/Littlemoss (Eastern Gateway) and Stoke park and ride • Buxton Line (journey time improvements)
Rail Interventions Not Appraised within the Economic Dimension at this stage. (Interventions in bold are within the EC SDC area)
• South Fylde Line (journey time and capacity improvements) • Service frequency enhancements between Ormskirk and Preston • Liverpool to Preston (journey time and service improvements) • Southport to Wigan (journey time improvements) • Colne to Accrington (journey time and service improvements) • York to East Coast journey time improvement • Skipton – Colne reopening • Bradford to Leeds (journey time improvements) • Harrogate Line (journey time improvements) and Harrogate – Skelton Junction • Blackburn to Manchester Victoria (journey time improvements) • Rossendale to Manchester public transport connectivity • New stations at LBA Parkway, East Leeds Parkway and Cottam Parkway • Rapid transit link between Liverpool South Parkway station and LJLA Airport • York to Hull (service improvements) • Hull to Scarborough (journey time and frequency improvements) • Cumbrian Coast Line – journey time and capacity improvements • Whitehaven to Newcastle (frequency improvements) • Furness Line – Journey time and reliability improvements • Windermere and Barrow to Manchester Airport (frequency and journey time improvements) • Windermere to West Yorkshire (service improvements) • Tyne Valley Line – route upgrade and service improvements • Durham Coast Line – route upgrade and service improvements • Middlesbrough Station • Darlington Station Growth Hub • Sunderland Station and Sunderland Station track layout improvements • Northallerton - Newcastle capacity enhancements and timetable resiliance • Newcastle Station including platform lengthening • Middlesbrough to York journey time and service improvements • Bishop Auckland to Saltburn Line journey time improvements • Increased service calls at Hartford and other WCML stations • Mid-Cheshire Line (journey time and capacity improvements) • Northwich to Sandbach reopening and new stations • Knutsford to Manchester Airport (Western Link connection) • Extension of Leeds – Chester service to Llandudno Junction • New station at Broughton • Preston/Bolton to Sheffield (direct connectivity/journey time improvements) • Rail connection and station for Doncaster Sheffield Airport • New station between Barnetby and Habrough

- South TransPennine Line – journey time and capacity improvements between Doncaster and Cleethorpes
- Sheffield to Lincoln (journey time improvements and service frequency enhancements)
- Penistone Line (journey time improvements and service frequency enhancements)
- Hallam Line (journey time improvements)
- Barnsley – Doncaster direct services
- Sheffield – Nottingham (journey time improvements)
- Stockport Station (later phases)
- Warrington Bank Quay (or integrated Station at Warrington)
- Wigan North Western (or integrated Station at Wigan)
- Gauge enhancements and journey time improvements between Selby and Port of Hull
- Port of Liverpool to West Coast Main Line enhancements
- West Coast Main Line freight capacity enhancements
- Port Salford rail freight access
- Freight prioritised gauge cleared route across the Pennines
- CLC line (Capacity and Service Improvements)
- Chester station - passenger & track capacity enhancements
- Enhanced public transport links to Fleetwood
- Continued programme of work to develop the capacity and capability of the rail network in the Leeds City Region
- East Coast Main Line spur to Newcastle Airport
- Heavy rail capacity and journey time improvement in the South Manchester area in addition to the Bus Rapid Transit Schemes connecting Wigan Borough and Salford City
- Birchwood park and ride
- **East Coast Main Line journey time and reliability improvements to address known issues on the route**
- **York – Newcastle improvements to existing ECML to make best use of IEP trains**
- **Newcastle Station platform lengthening**
- **Doncaster – Leeds capacity improvements**
- **Doncaster Station remodelling to reduce conflicts**
- Lancaster – Morecambe (capacity improvements)
- Crewe to Preston (capacity improvements)
- Borders Railway extension

Distributional Impacts

8.15 Distributional Impacts (DI) consider the variance of transport intervention impacts across different social groups. DfT guidance on Distributional Impact Appraisal[73] identifies the eight indicators where DI may apply, beneficially or adversely: user benefits, noise, air quality, accidents, security, severance, accessibility and personal affordability. Step 1 in a DI appraisal is a screening process, identifying whether any impacts which remain after mitigation actions are either significant or concentrated and therefore whether progressing DI appraisal through subsequent steps in the process is necessary.

73 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/638644/TAG_unit_a4.2_distrib_imp_app_dec2015.pdf (December 2015)

8.16 A DI Screening Pro-Forma has been completed and is included within the Transport Forecasting and Economic Appraisal Report. At the programme level, the following impacts are identified through the screening process as having the potential for significant or concentrated consumer (non-business) impacts during the operational phase[74]:

- **User benefits**: changes in consumer (non-business) journey times, including from improved reliability and punctuality. This impact area has the closest match with the rationale underlying the SDC programme, with the expected outcomes being in terms of journey time savings which effectively improve connectivity between residents and opportunities and improve accessibility by offering greater choice of in-scope destinations
- **Personal Affordability:** changes in consumer (non-business) journey costs considering highway impacts (vehicle operating costs)

The potential for the above two indicators to have a material DI impacts has been appraised within this SPOC, and can be found in Chapter 13 described under the relevant social impacts indicators. Both areas are fundamental to the strategic objectives which underpin the SDC programme in support of TfN's STP (see Table 4.1), together representing the improvement in connectivity from a more efficient transport system and resulting gain in productivity.

8.17 The screening process should not be interpreted as a suggestion that TfN does not consider the remaining DI impacts as unimportant or unaffected. As business cases for interventions within the SDC individually or in packages come forward, the DI screening process will be repeated. At a more local scale it is likely that the screening process will identify a different group of indicators to take to DI appraisal.

8.18 It is further noted that the impacts identified for consideration above, are simply where material impacts of the programme overlap with indicators which DfT has identified for their Distributional Impact potential. Elsewhere in the Economic Dimension, the material impacts of the programme are considered – with particular attention given where these align with the underpinning strategic rationale.

Structure of Economic Dimension

8.19 The remainder of the Economic Dimension of this SPOC is structured as follows:

- Chapter 9 describes the approach to costing interventions, including the treatment of optimism bias, and summarises the overall cost of the programme

[74] DfT DI Guidance excludes employers' business trips and impacts during construction

- Chapter 10 outlines the approach to quantifying the impacts of the programme, including the forecasting of demand impacts and the processes of economic appraisal
- Chapters 11 to 14 follow the format of DfT's Appraisal Summary Table introducing the SDC Programme's: **Economy** impacts (11); **Environment** impacts (12); **Social** impacts (13); and **Public Accounts** impacts (14)
- Chapter 15 brings the various impacts together, with a consideration of the robustness of the analyses completed, as a **Value for Money** statement for the programme

9 Approach to Cost Estimation

Introduction

9.1 This chapter sets out the derivation of the implementation costs of delivering the East Coast - Scotland SDC programme and the lifecycle costs, comprising renewal and maintenance costs for the interventions delivered.

9.2 The monetised Economic Appraisal, which forms the foundation of the VfM Appraisal, represents the difference between a Reference Case[75] and the interventions of the SDC programme.

9.3 Subsequent text describes the approaches to cost risk and uncertainty, including the treatment of Optimism Bias. This chapter concludes by presenting the net costs which are compared against monetised benefits within the Economic Appraisal.

Approach to Intervention Sequencing

9.4 For reasons of practicality, the approach to quantifying the impacts of the East Coast - Scotland SDC programme adopts a proportionate approach of assuming a single opening year for all interventions. For internal consistency, within the Economic Dimension the same approach has been taken with implementation costs, represented up to a 2035 assumed opening year and lifecycle costs from then onwards (over a 60 year appraisal period (2035-2094).

9.5 It is noted that this approach does not have any material effect on the results of the economic appraisal, or the robustness of any conclusions based on that appraisal. In terms of implementation costs, this approach effectively assumes that the discounted cost would not change if it was assumed to be incurred in a different year, that is that the downward effect of discounting and the upward effect of real terms inflation and increasing uncertainty would tend to cancel each other out.

[75] For further details, see paragraph 2.35 onwards

SDC Programme

Implementation Costs

9.6 The East Coast economic appraisal considers the capital cost of the SOP itself, together with any changes in the capital cost of operation and maintenance in future years. Only those schemes presented in Table 8.1: and Table 8.2 are considered within this economic appraisal.

9.7 It should be noted that the costs used in economic appraisal differ from the outturn costs used for funding decisions and to those presented within the Financial Case. For the economic appraisal of the East Coast - Scotland SDC, all monetary units are presented in 2010 discounted market prices.

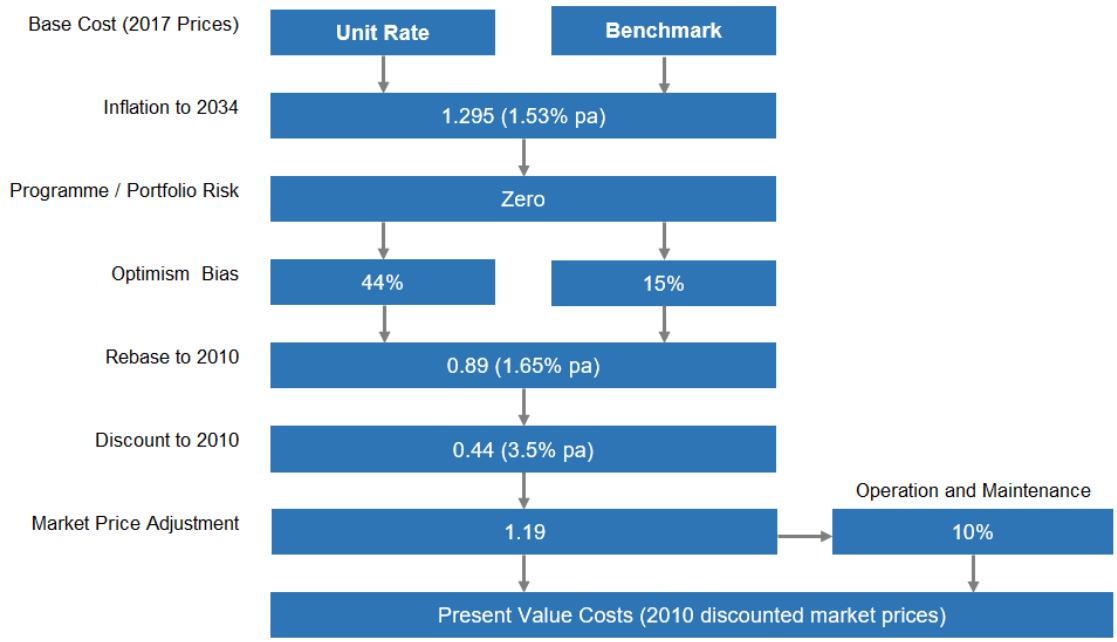
9.8 As part of the SDC programme, three sources of deriving representative base scheme costs have been used:

- Unit Rates – a series of rates per km or per intervention type provided by Benchmark which drew upon their industry knowledge and database which contained scheme cost information which was not publicly available. These unit rates include all construction costs, design and preparation, lands costs, enabling works, supervision, statutory undertakers and third-party infrastructure costs before risk and inflation.
- Benchmark – Some of the Connecting Energy Coast schemes included within the East Coast appraised SOP were not considered suitable to be costed via the unit rate methodology due to their complexity (e.g. schemes with complex structures, bridges or known engineering challenges) or anticipated high value. Benchmark prepared base costs for these interventions based upon the Highways England Major Projects standard cost estimate structure and AACEI Class 5 given the early concept stage which the SDC SOP is currently at.
- Developer – where available, if a scheme has been progressed to a level where the promotor has projected scheme costs, then these will be used if deemed appropriate.

9.9 It should be noted that the process described in this section refers to highway capital costs. The approach to developing passenger rail costs is set out in the Passenger Rail SPOC (October 2019).

9.10 These two sources of costs provide values scheme base costs in 2017 prices. The process to convert 2017 scheme base costs to 2010 discounted market prices to be used in appraisal is presented within Figure 9.1. Further details are provided below and in the Economic Appraisal Report.

Figure 9.1: Estimation of Costs for Appraisal



9.11 Table 14.1 (in Chapter 14) presents the East Coast SOP scheme costs in the format of the DfT's CPSS Cost Proforma Summary Sheet. This shows the build-up of the scheme costs from 2017 Base Costs through to 2010 discounted market prices representing the SOP investment costs. Section 14 also presents the Present Value Costs of the East Coast SOP.

9.12 Although a cost allowance has been made for Operation and Maintenance, at this early stage of appraisal the expected benefits generated by net savings from construction and future year maintenance have not been captured.

Lifecycle Costs

9.13 Given the early stage of scheme development, a full assessment of expected renewal and maintenance costs has not been undertaken. For the purposes of the economic appraisal, operation and maintenance costs equivalent to 10% of the Present Value (PV) of total capital costs has been included.

9.14 These costs have been assumed to all be incurred within the single year of 2035.

Cost Risk and Uncertainty

9.15 Given the early stage of cost development, no risk or contingency has been included.

9.16 The 44% Optimism Bias applied to schemes costed through the unit rate methodology is in line with WebTAG guidance for Road schemes at Stage 1 of scheme development.

9.17 For Benchmark costed schemes, a lower level of 15% Optimism Bias has been applied. This is a reflection of the robust evidence based and costing

methodology available to Benchmark as a result of their intellectual property, industry experience and application of risk within the 2017 base costs. The risk allowances Benchmark applied were based on typical levels for estimates within the Major Projects portfolio and are consistent with Highways England submissions. As set out in WebTAG A1.2 paragraph 3.5.10 "*in cases where the risk assessment can draw on an extensive reference class database of similar schemes; accounts for unquantifiable risks through a top-down uncertainty adjustment; and is complemented by governance arrangements, such as verification of cost estimates by independent experts, robust and comprehensive cost estimation can potentially reduce the optimism bias adjustment. The Highways England's Project Control Framework is an example where this has been effectively applied.*"

9.18 The SDC programme cost estimate is based upon the assumption that the full package of measures associated with the programme will be delivered by 2035. At this stage of scheme development, it has been assumed that all costs will be incurred in the single year of 2034.

10 Quantified SDC Programme Impacts

Introduction

10.1 This chapter summarises the quantification of the impacts of the East Coast - Scotland SDC programme including the approach to and results of the demand forecasting undertaken and of the monetised Economic Appraisal. It describes how the transport models used to represent the impacts of the Reference Case and SDC Programme fit within TfN's wider analytical framework.

Approach to Demand Forecasting

10.2 This section sets out the approach to:

- Highway demand modelling;
- Passenger rail demand modelling; and
- Freight and logistics modelling.

Highway Demand Modelling

10.3 Highway forecasting was undertaken using a modified version of Highways England's 2015 North Regional Transport Model (RTM). It is the same model which was used for the highway demand modelling associated with the Connecting the Energy Coasts SDC. The assignment model is for the average hours of AM Peak (07:00 to 10:00), Inter Peak (10:00 to 16:00) and the PM Peak (16:00 to 19:00).

10.4 Future year forecasts have been developed for 2035 and 2050 using DfT's NTEM forecasts. The full forecasting process is described in detail in the Combined Transport Forecasting and Economic Appraisal Report (ComMA September 2019).

10.5 Generalised Costs for Value of Time (VoT) and Vehicle Operating Costs have been included from TAG Databook May 2018.

Passenger Rail Demand Modelling

10.6 Rail passenger forecasting was undertaken using the NoRMS Phase 2 model, which was developed by TfN and is a Cube-based rail assignment model of the North of England, including all rail stations. The model includes a simplified representation of the network outside of the North, providing access to external destinations, and is combined with an endogenous impact model to provide elasticity-based changes in demand based on changes in service provision. Further details are available within the Rail SPOC.

Freight and Logistics Modelling

10.7 The Freight and Logistics Market is modelled using the Great Britain Freight Model (GBFM) managed and owned by MDS Transmodal (MDST). The inputs to the model come from standard DfT statistics for Ports and Maritime, road data collected through the Continuing Survey of Roads Goods Transport (CSRGT) and private sector intelligence. MDST also utilise Network Rail data which although highly sensitive, is presented in such a way so individual rail flows cannot be identified. The Heavy Goods Vehicle and Van data that is used to model the road freight impacts can be aggregated in terms of benefits. The other freight scenarios that have been used include looking at the impact of larger ships, warehouse clustering and rail capacity that is both constrained and unconstrained. These scenarios cannot be aggregated together as they rely on very different economic conditions and private sector investment to grow.

Forecast Impact of the SDC Programme

10.8 The forecast impact on traffic flows of the SDC programme is shown in Figure 10.1, Figure 10.2 and Figure 10.3 below. It should be noted that new links in the SOP will show as large increases as they do not have a Reference Case flow to calculate against. These include schemes with new links in Durham, Hartlepool, Scotch Corner, Ponteland, Portrack in Middlesbrough and the new link connecting the A69 to the A1 north of Newcastle Airport.

10.9 There is a clear pattern throughout each time period with flows increasing on the main strategic route in the area the A1(M) and A1 while flows are decreasing on alternative and parallel routes (A19 south of Sunderland & the A68). These changes in vehicle flow between the SOP and Reference Case are largely due to the A1(M) Junction 60 to Chester-Le-Street Smart Motorway scheme and the A1 dualling North of Ellingham to Berwick.

10.10 The new A69-A696-A1 link forming a NW ring road north of Newcastle airport combined with the two schemes on the A19 north of the River Tyne, the A19 Seaton Burn junction grade separation upgrades and increased capacity provided by the A19 junction and on-line improvements between Killingworth interchange and Silverlink interchange. All three of these SOP

interventions combine to create an improved connection to the A1 from areas to the west and east of Newcastle. This provides relief for the existing section of the A1 running to the west and north of Newcastle along with existing routes in Newcastle. South of the River Tyne the increased capacity provided by the A19/ B1404 Seaton Lane to A19/ A183 Chester Road on-line improvement west of Sunderland provides a further improved section of the A19 resulting in a reduction of flows and improved conditions on surrounding alternative routes in Sunderland.

10.11 Local interventions involving new links and connections including Ponteland Relief Road, Durham Western relief Road, Hartlepool Western Growth Corridor, Portrack Relief Road and A66 to A1(M) new link and junction north of Scotch Corner result in localised rerouting and provides relief to existing areas of congestion.

10.12 Figure 10.4 provides spatial summary of the economic benefits by sector of origin. A high proportion of the user benefits can be seen in the Tyne and Wear region, in particular in and around Newcastle where there are SOP interventions including the new A69-A696-A1 link road north of Newcastle, the A19 Seaton Burn junction grade separation and increased capacity on a section of the A19 east of Newcastle and West of Sunderland. This suggests the East Coast SOP is offering benefit to the congested sections of the A1 and A19 key strategic corridors by providing increased capacity and improved connectivity in this area. Further benefits are observed along the upgraded A1 corridor heading north to Berwick and onwards to Scotland. Several areas along the A1(M) corridor are also benefiting from the Smart Motorway intervention on this key corridor along the East Coast.

10.13 Generally, the areas with strong benefits correlates strongly with the location of the SOP appraised highway interventions including some of the more localised interventions such as Portrack Relief Road in Middlesbrough, Durham Relief Road, Hartlepool Western Growth corridor connecting with the A19 and the new connection between the A66 and A1(M) to the north of Scotch Corner.

Figure 10.1: AM 2050 SOP Flows - 2050 Reference Case Flows (Passenger Car Units, PCU)

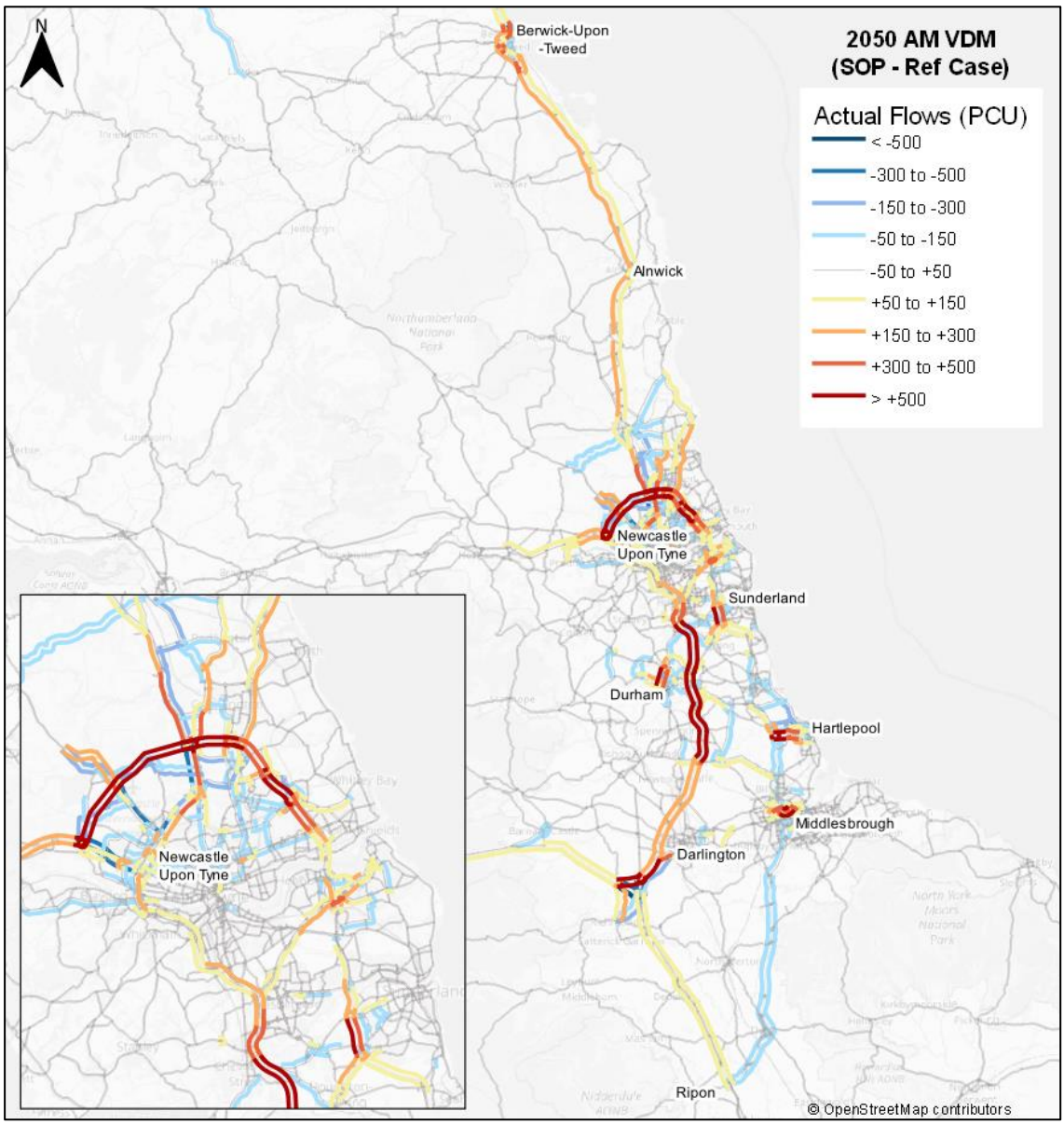


Figure 10.2: IP 2050 SOP Flows - 2050 Reference Case Flows (PCU)

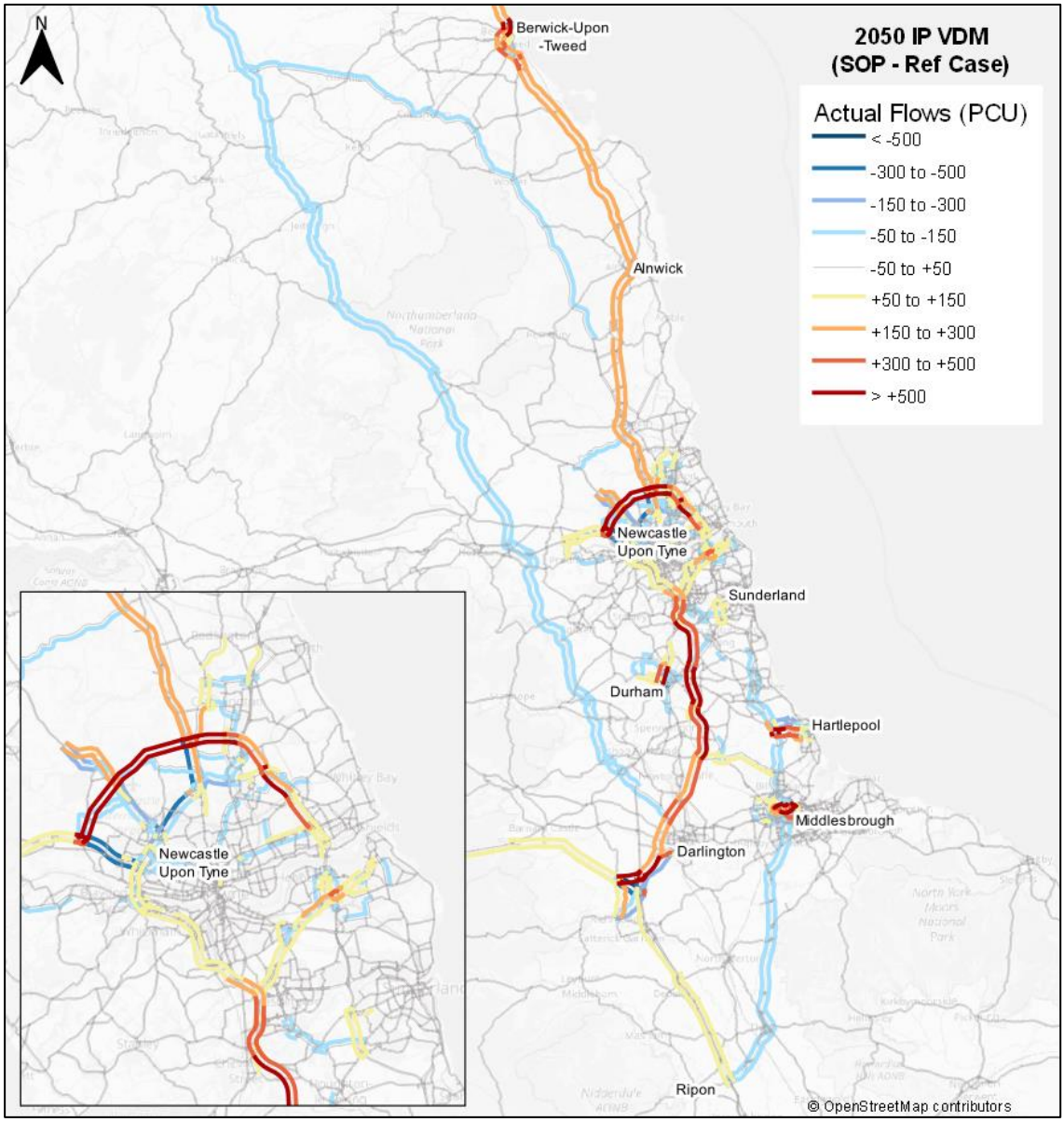


Figure 10.3: PM 2050 SOP Flows - 2050 Reference Case Flows (PCU)

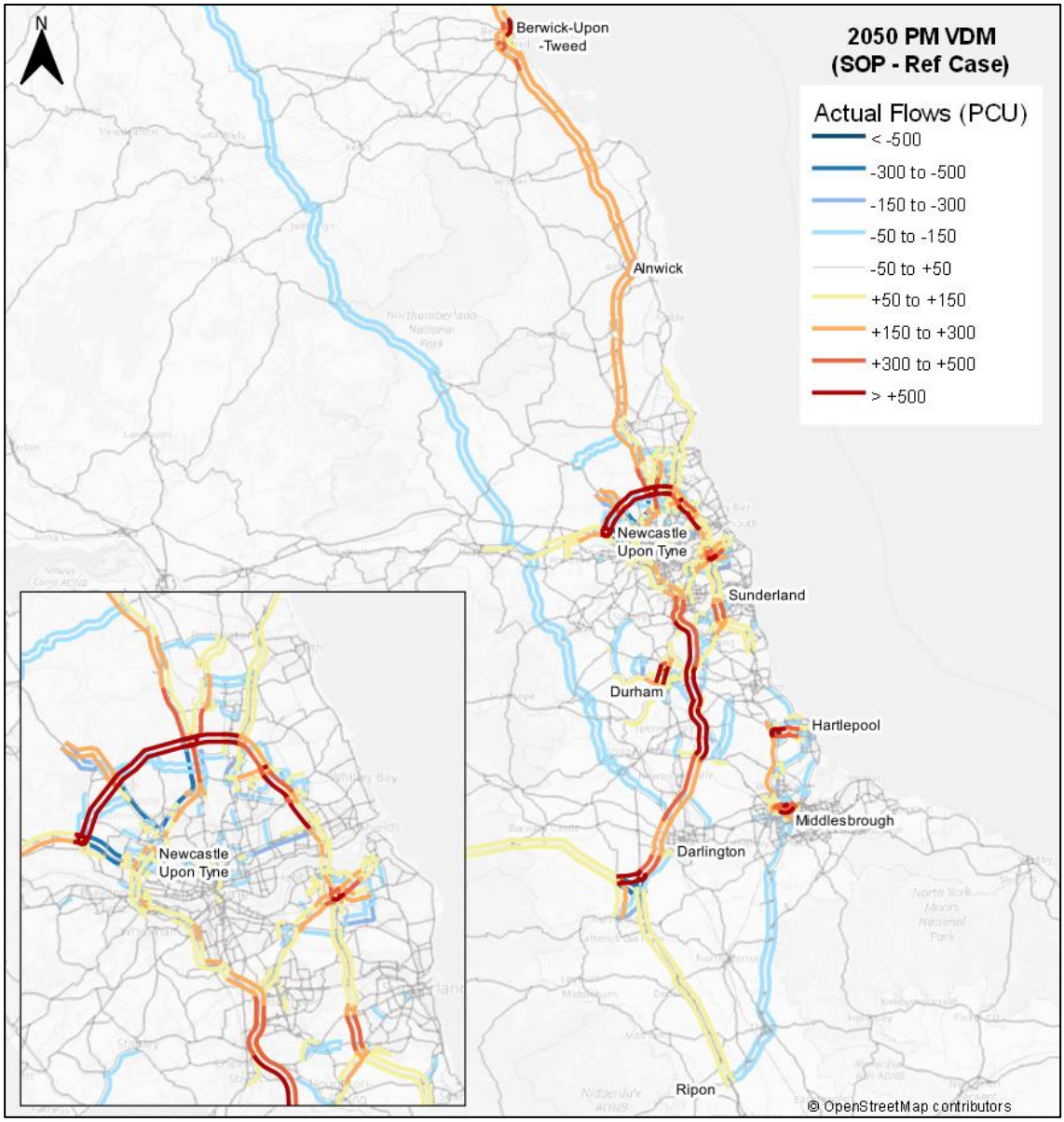
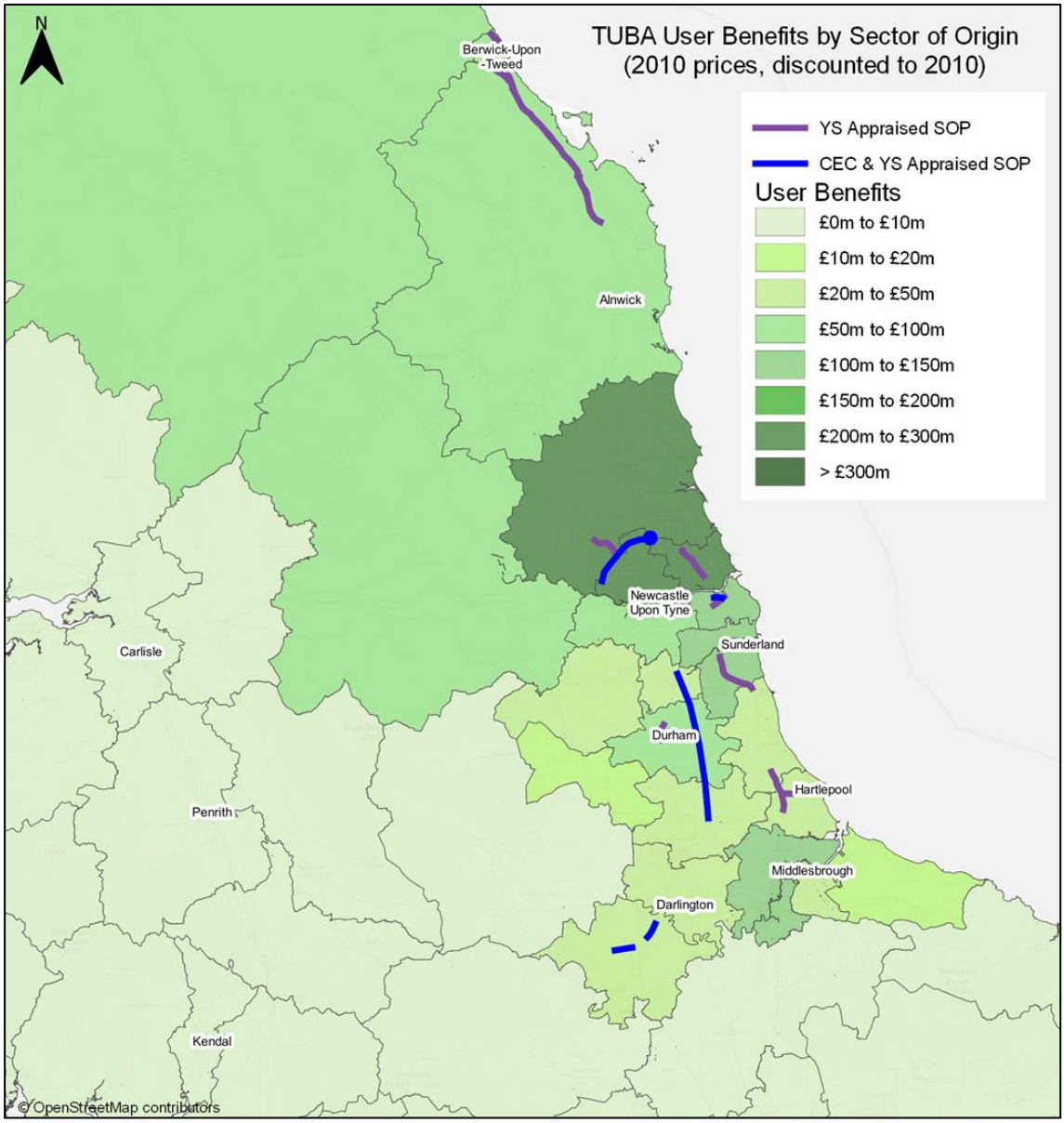


Figure 10.4: Distribution of Benefits



Approach to Economic Appraisal

10.14 The Economic Appraisal approach has been agreed through TAG and SMG and follows WebTAG guidelines. As noted previously, this approach is consistent across all SDC studies.

Level 1 Established Monetised Impacts

10.15 Level 1 user benefits have been appraised using TUBA 1.9.11 software. This uses the values based on DfT WebTAG economic Data Book from May 2018. As noted previously, although this databook has now been superseded, the May 2018 databook has been used to ensure consistency in the appraisal between SDCs. The appraisal methodology and scope was previously agreed at TAG and has been applied consistently across all SDCs. It includes data on the following:

- Values of time and growth in VoT;
- Fuel costs, rates of fuel consumption and changes in vehicle efficiency over time;
- Vehicle occupancies;
- Journey purpose splits;
- Rates of taxation; and
- Carbon values for assessing the impact of the schemes on CO2 emissions

10.16 The Level 1 monetised impacts include:

- Journey time savings;
- Vehicle operating costs;
- Greenhouse gases; and
- Indirect tax revenues.

10.17 For this stage of study, Level 1 economic benefits have not been quantified for accidents, physical activity, journey quality, noise and air quality.

Level 2 Evolving Monetised Impacts

10.18 Level 2 benefits have been used to generate an adjusted VfM metric. This seeks to assess the following elements:

- Reliability benefits;
- Static clustering – specific reference to NPIER prime / enabling capabilities;
- Output in imperfectly competitive markets; and
- Labour supply impacts

10.19 Level 2 static Wider Economic Benefits (WEBs) have been assessed using WITA and is based on agglomeration and decay parameters, incorporating the impacts of WEBs described in WebTAG unit A2.1. A full breakdown of the appraisal parameters is documents in the Combined Modelling & Appraisal report.

Level 3 Indicative Monetised Impacts

10.20 Level 3 benefits have not been quantified as part of the appraisal for this stage of work.

Non-Monetised Impacts

10.21 Non-monetised impacts form a key component of assessing the overall value for money of a scheme. For the East Coast - Scotland SDC, the following non-monetised assessments have been undertaken:

- Regeneration
- Landscape
- Townscape
- Historic environment
- Biodiversity
- Water environment

Scope of Economic Appraisal

10.22 The scope of Economic Appraisal has been agreed through TAG and SMG and seeks to provide a robust, yet proportionate, appraisal of the East Coast SOP given the current stage of scheme development. This is in line with WebTAG guidelines.

10.23 As presented in Chapter 15, the overall Value for Money of the East Coast SOP will be determined through a consideration of both monetised and non-monetised benefits which fall across the three levels of benefits detailed in preceding section.

For clarity as to the scope of economic appraisal, Table 10.1 sets out the monetised and non-monetised assessments undertaken across the three level of benefits.

Table 10.1: Scope of Economic Assessment for East Coast SDC

	Established Monetised Impacts *Included in initial and adjusted metrics*	**Evolving Monetised Impacts** *Included in adjusted metric*	**Indicative Monetised Impacts** *Considered after metric using switching values approach*	**Non-Monetised Impacts**
Level	**1**	**2**	**3**	**Qualitative**
Included in appraisal at this stage	Journey time savings Vehicle operating costs Greenhouse gases Affordability Cost to Broad Transport Budget Indirect Tax	Reliability Static clustering Output in imperfectly competitive markets Labour supply		Regeneration Landscape Townscape Historic environment Biodiversity Water environment

	Established Monetised Impacts *Included in initial and adjusted metrics*	Evolving Monetised Impacts *Included in adjusted metric*	Indicative Monetised Impacts *Considered after metric using switching values approach*	Non-Monetised Impacts
Not included in appraisal	Noise Air Quality Accidents Physical activity Journey quality		Move to more / less productive jobs Dynamic clustering Induced investment Supplementary economy modelling	Security Severance Access to services Option and non-use values

11 Economy Impacts

Introduction

11.1 Following the structure of DfT's standard AST, this chapter sets out the economic impacts on business users of the SDC Programme, including the Transport Economic Efficiency (TEE) impacts which are represented within the Economic Appraisal. This chapter also contains an assessment of Regeneration and Wider Impacts. The impacts on non-business users (consumers) form part of the social impacts and are covered in chapter 13.

11.2 The impact of the East Coast - Scotland SDC programme on the Northern Economy is of particular importance to the VfM case presented in this SPOC given that it is based on identifying the interventions which will unlock delivery of the transformational growth set out within NPIER. However, as set out in paragraph 8.11 the economic appraisal is based on 'business as usual' growth as represented in DfT's NTEM (Version 7.2, latest version).

Business Users & Transport Providers

11.3 A summary of the business user impacts calculated by TUBA is provided in Table 11.1. Although business users represent a small proportion of the overall trips their high VoT means that they are a large proportion of the overall benefits generated.

Table 11.1: Business User Impact

Business ***User benefits***	ALL MODES TOTAL	ROAD	
		Good Vehicles	Business Cars
Travel time	1,046.60	478.36	568.24
Vehicle operating costs	-29.69	-6.67	-23.02
User charges	0.61	0.09	0.51
Subtotal	**1,017.52**	**471.78**	**545.74**

*Discounted present values, in 2010 prices and values (£m)

11.4 As this SPOC considers the highway impact, the appraisal does not monetise the impact upon Transport Providers and therefore this has not been reported.

Reliability Impact on Business Users

11.5 It is expected that the SDC programme will have a positive impact on reliability due to the improved level of capacity and the provision of alternative routes such as improvements to north-south connectivity providing resilience to the A1 and A19 corridors.

11.6 Table 11.2**:** provides a summary of the estimated reliability impacts on Business Users. Using an approach applied on previous projects and with reference to DfT guidance[76], reliability impacts have been calculated based upon 10% of the travel time savings calculated by TUBA.

Table 11.2: Business Users Reliability Impacts

	Total
Reliability Impact on Business Users	104.66

*Discounted present values, in 2010 prices and values (£m)

Regeneration

11.7 With reference to TAG Unit A2.2, the schemes included in the East Coast - Scotland SDC programme represent a substantial investment in transport provision across the corridor, which are designed to improve connectivity which in turn will support land use development and redevelopment. Thus, it is considered likely that the East Coast - Scotland SDC programme will generate ***strong beneficial*** regeneration impacts.

Wider Impacts

11.8 It is expected that the SDC programme will generate strong wider impacts due to improved connectivity linking businesses. Due to the absence of active travel and bus costs in the model the WITA agglomeration impacts and labour supply impacts have been reduced by 30%. The output change in imperfectly competitive market is derived from TUBA (10% of car business user benefits) and therefore not affected by the absent modes. This reduction produces the upper bound wider benefits as reported in Table 11.3:.

11.9 The lower bound benefits have been estimated by applying weighted average 'distance decay' and agglomeration elasticity' parameters following WebTAG guidance. This is to test the impact of the large proportion of

[76] DfT, 2013. Value for Money Assessment: Advice Note for Local Transport Decision Makers

'other' employment across the Local Authorities in the SDC area on the wider benefits[77].

11.10 This sensitivity test produces the lower bound wider benefits as reported in Table 11.3:.

Table 11.3: Level 2 Wider Impacts Summary

	Lower Bound	Upper Bound
WI1 – Agglomeration Impacts		
Manufacturing	71.51	24.80
Construction	25.51	19.58
Consumer Services	117.89	68.38
Producer Services	131.08	258.71
Sub-Total	**346.00**	**371.47**
WI2 – Output change in imperfectly competitive market		
Sub-Total	54.57	54.57
WI3: Tax revenues arising from labour market impacts		
Labour supply impacts	7.14	6.93
Move to more / less productive jobs	0	0
Sub-Total	7.14	6.93
Total Wider Benefits	407.71	432.97

*Discounted present values, in 2010 prices and values (£m)

Summary

11.11 **Table 11.4:** below summarises the Economy impacts:

Table 11.4: Summary of SDC Programme Economy Impacts

Economy Impacts	
Business user benefits	1,017.52
Reliability impacts on business users	104.66
Regeneration	Strong beneficial
Wider Benefits (Level 2)	407.71 – 432.97

*Discounted present values, in 2010 prices and values (£m)

12 Environment Impacts

Introduction

12.1 One of Transport for the North's Pan-Northern transport objectives is "promoting and enhancing the built, historic and natural environment". Environmental objectives of the STP have been influenced by an Integrated Sustainability Appraisal (ISA) to ensure that environmental considerations, and sustainability more widely, are embedded throughout the STP. This approach supports TfN in developing and delivering a sustainable

[77] This reflects the fact that the Lower Bound WITA sensitivity test assesses the impact on 'other' industrial sectors, notably the public sector, following the guidance in TAG Unit A2.4 para 5.1.6 to 5.1.8.

Investment Programme that promotes and where possible enhances the environment of the North.

12.2 To inform appraisal at the SDC Programme level, an environmental appraisal of the SOP interventions has been undertaken. Following the structure of DfT's standard Appraisal Summary Table (AST), this chapter sets out the potential impacts to the environment of the SDC Programme, particularly noting any disbenefits that may occur.

12.3 The potential environmental impacts of the East Coast - Scotland SDC Programme are set out as an Environmental Appraisal[78] report, which takes a relatively high-level view – appropriate to the impacts anticipated from a geographically and temporally dispersed programme of interventions of varying scale and type.

12.4 Traffic related environmental topics (i.e. Noise, Air Quality and Greenhouse Gases) have been appraised and scored as part of the development of interventions identified by this SPOC using a high-level, qualitative approach informed by traffic modelling. Environmental impact appraisal scores are provided using WebTAG scoring categories. Given uncertainty in scheme characteristics, the environmental baseline and future trends quantitative appraisal was not considered proportionate or to provide meaningful appraisal at this stage. Quantitative appraisal would be conducted at later stages of SOP programme development.

12.5 Environmental impact appraisal scores for other environmental topics (Landscape, Townscape, Historic Environment, Biodiversity and Water Environment) have been appraised using a risk-based approach as it is considered there is too great an uncertainty of the characteristics and environmental impacts of these interventions at this stage to provide a more precise appraisal for these topics. A summary of the potential risks related to these topics is provided below. This has been developed using a precautionary approach, that is the programme as a whole has been assessed according to the most likely risk of potential adverse impacts on the key environmental resources. As business cases for interventions within the SDC individually or in packages come forward, additional environmental appraisal would be undertaken for all topics.

Noise

12.6 The SOP interventions risk conflicting with NPPF, NPSE, the NECA Transport Manifesto, NYCC Local Transport Plan and Policies 7 and 33 of the West Yorkshire Combined Authority Transport Strategy through the proposed construction of several new road links, some of which may result in drawing traffic through existing NIAs.

12.7 The SOP interventions also provide the opportunity to comply with policy aims to avoid significant adverse noise impacts on health and quality of life

[78] Key Product 5: Environmental Appraisal Report (August 2019)

through proposed relief roads, particularly around Ponteland, Durham and Portrack which would divert traffic from urban areas, improving overall townscape.

12.8 TfN will continue to work with local authorities, Highways England and communities to discuss and agree mitigation strategies for all potential interventions.

Score: Moderate adverse

Air Quality

12.9 The SOP interventions risk conflicting with NPPF and the NECA Transport Manifesto, NYCC Local Transport Plan and Policies 7 and 33 of the West Yorkshire Combined Authority Transport Strategy 2040with some of the proposed interventions passing through existing AQMAs. However, the construction of these new road links has the potential to have a positive effect on the reduction of emissions in urban areas.

12.10 TfN will continue to work with local authorities, Highways England and communities to discuss and agree mitigation strategies for all potential interventions.

Score: Moderate adverse

Greenhouse Gases

12.11 The SOP interventions would lead to an increase in carbon emissions would risk conflicting with United Nations Framework Convention on Climate Change (UNFCCC) agreement, NPPF and NECA Transport Manifesto, NYCC Local Transport Plan 2016 – 2045 and Policy 7 and 58 of the West Yorkshire Combined Authority Transport Strategy 2040, all which emphasis a move towards a reduction in carbon emissions.

12.12 TfN will continue to work with local authorities, Highways England and communities, looking at genuine alternative transport options and opportunities for sustainable transport solutions. This will include measures to stimulate the update of electric vehicles.

12.13 An adverse impact in greenhouse gas emissions as a result of the increase in vehicle kilometres is also supported by the estimation of the monetised impact of greenhouse gases using TUBA. The results are shown in Table 12.1:.

Table 12.1: Greenhouse Gases Monetised Impact

	Total
Greenhouse Gases	-85.84

*Discounted present values, in 2010 prices and values (£m)

Score: Moderate adverse

Landscape and Townscape

12.14 The SOP includes improvement schemes near to Northumbria National Park and the North York Moors National Park, which have potential to change

views from these designated areas. Impacts risk conflicting with NPPF and NPSNN in relation to National Parks. A number of the SOP interventions may affect the setting of Heritage Coasts and an AONB.

12.15 The interventions also risk adverse impacts on landscape character of national character areas, conflicting with planning policy relating to the protection of valued landscapes particularly of NCA13, NCA14, NCA15 and NCA23 in which interventions may cumulatively or in isolation degrade the characteristics of these areas. TfN will continue to work with local authorities, environmental stakeholders and communities to discuss and agree mitigation strategies for all potential interventions.

12.16 **Risk appraisal: Potential to have significant implications for the SOP.**

Historic Environment

12.17 SOP interventions risk impacting Hadrian's Wall World Heritage Site. The World Heritage Site is the most important cultural heritage designation and therefore given the greatest weight in planning policy. Impacts to these sites risk being at odds with policy in the NPPF and NPSNN. The interventions risk affecting several designated heritage assets of national value.

12.18 A68 and A7 SRN falls within close proximity to Belsay Hall Grade I Registered Park and Garden, Capheaton Grade II Registered Park and Garden and Kirkharle Hall Grade II Registered Park and Garden, the A1M Barton to Chester Le Street falls in close proximity to Lumley Castle Grade II Registered Park and Garden and A1 North of Ellingham to Edinburgh Dualling is in close proximity to Lumley Castle Grade II Registered Park and Garden. These schemes risk slight adverse impacts on the features of these heritage assets. It is anticipated that using mitigation measures, the direct impacts of the SOP interventions and setting impacts will be minimised.

12.19 TfN will continue to engage with Historic England, local authorities and communities to discuss and agree mitigation strategies for all potential interventions.

12.20 **Risk appraisal: Potential to have significant implications for the SOP.**

Biodiversity

12.21 Several of the interventions have the potential for adverse impacts on European designated sites, SSSI, national nature reserves and RSBP reserves and will require a design which mitigates or compensates for any impacts to comply with the requirements of the Habitats Directive.

12.22 TfN will continue to work with Natural England, local authorities, environmental stakeholders and local communities to discuss and agree the appropriate enhancement measures and actions for this.

Risk appraisal: Likely to have significant implications for the SOP.

Water Environment

12.23 SOP interventions fall within the catchment of several main rivers and water courses which have the potential to contribute to the pollution of surface water, including existing infrastructure and new road links. With the use of appropriate mitigation, the impact on water quality will be negligible.

12.24 The SOP includes schemes which fall within flood zones which have the potential to alter floodplains or increase flood risk. Using appropriate mitigation these interventions will not adversely affect floodplains or increase flood risk to sensitive receptors.

12.25 TfN will continue to work with the Environment Agency, local authorities and communities to agree and discuss mitigation strategies for all potential interventions.

Risk appraisal: Potential to have significant implications for the SOP.

Summary

12.26 The transport network of the East Coast to Scotland SDC would undergo significant changes if the proposed SOP was delivered, including the creation of new relief roads and road improvements. These interventions would create increases in road induced noise and carbon emissions and a decrease in air quality. However, with the anticipated move in the medium to long term to electric vehicles and improvements in road vehicle fuel efficiencies, these adverse effects will be offset.

12.27 The SOP includes road improvements that are near environmental designations and resources, therefore local environmental impacts are anticipated. These impacts include potentially significant implications for landscape and townscape characteristics, and risk of direct impacts to the setting of cultural heritage assets. The SOP also has the potential for impacts on other designations of national and local value, including ecological networks, an area of outstanding natural beauty and registered parks and gardens.

12.28 It is anticipated that the environmental impacts can be mitigated or avoided through further environmental assessment and option development. In some cases, opportunities for environmental enhancements can be identified. Following this process, the majority of the SOP interventions are likely to comply with the relevant national and regional policies and contribute to the objectives established in the Integrated Sustainability Appraisal (ISA).

12.29 Interventions proposed through this study will be taken forward through other separate commissions to Strategic Outline Business Case (SOBC) in line with the Department for Transport's Transport Business Case approach. This will include more detailed consideration of individual interventions or groups of interventions, for which appropriate WebTAG compliant environmental appraisal will take place. Subsequently, any schemes will undergo further environmental assessment through the Highways England

Project Control Framework (PCF) process, local authority or Nationally Significant Infrastructure planning consent processes. This is likely to include an Environmental Impact Assessment (EIA) for many of these schemes, a process that will lead to production of an Environmental Statement (ES) to be submitted with any application for development consent. The environmental impacts of these schemes will inform the consenting authority's decision.

12.30 Table 12.2 below summarises the Environment impacts:

Table 12.2: Summary of Environment Impacts

	East Coast highway SOP
Noise	Moderate adverse
Air Quality	Moderate adverse
Greenhouse Gases *Monetised Impact from TUBA*	Moderate adverse *-£85.84m*
Landscape	Potential to have significant implications for the SOP
Townscape	Potential to have significant implications for the SOP
Historic Environment	Potential to have significant implications for the SOP
Biodiversity	Likely to have significant implications for the SOP
Water Environment	Potential to have significant implications for the SOP

13 Social Impacts

Introduction

13.1 Following the structure of DfT's standard AST, this chapter sets out the potential impacts to the social impacts of the SDC Programme, including the TEE impacts (Commuting and Other Users, and Personal Affordability) which are represented within the Economic Appraisal.

Commuting and Other Users (Travel Time)

13.2 Table 13.1 provides a summary of the impacts on consumer users (time only) as calculated by TUBA. A full set of impacts on commuting and other users is reported in the personal affordability section and the TEE table.

Table 13.1: Summary of Consumer User Impacts (Travel Time)

Consumer Users	Private Cars / LGVs
Non-Business Commuting Travel time	528.99
Non-Business Other Travel time	390.78
Subtotal	**919.76**

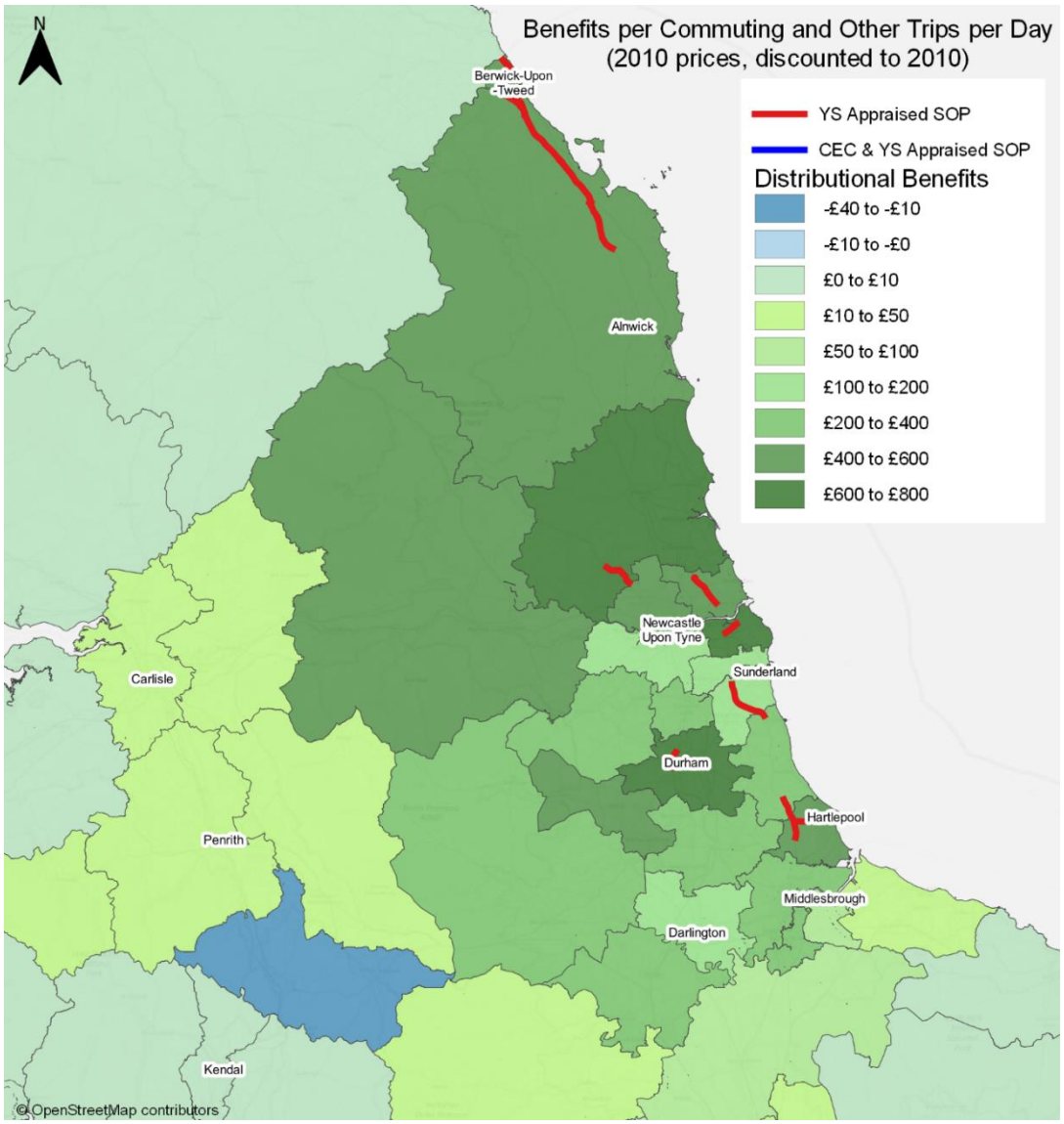
*Discounted present values, in 2010 prices and values (£m)

Distributional Impacts

13.3 Figure 13.1 provides a spatial summary of the economic benefits on a per trip basis. This considers the distribution of commuting and other benefits divided by the total number of base commuting and other trips. Please note that this does not include business trips or their associated benefits.

13.4 The most significant benefits are again seen in the Northumberland, Tyne and Wear and the area surrounding the A1(M) corridor. Small per trip disbenefits are generated in the Tebay area however this is only minor in comparison to the significant benefits along the East Coast. There is a small increase in flows in this area on the A685 and A66. This therefore leads to a slight increase in delays and journey time in particular at the junction with the B6259 Nateby Road. The changes in flow are likely to be related to the new A66 to A1(M) link and new junction north of Scotch corner. This makes the A685 & A685 a more attractive route in the SOP network compared to the Ref Case as conditions on this key connection with the A1(M) have been improved.

Figure 13.1: Distributional Impacts



Reliability impact on Commuting and Other Users

13.5 Using an approach applied on previous projects and with reference to DfT guidance[79], reliability impacts have been calculated based upon 10% of the travel time savings calculated by TUBA. Table 13.2 provides a summary of the reliability benefits for commuting and other users.

Table 13.2: Commuting and Other Users Reliability Impacts

Reliability Benefits	Total
Non-Business Users Commuting	52.90
Non-Business Users Other	39.08
Sub-Total	**91.98**

*Discounted present values, in 2010 prices and values (£m)

[79] DfT, 2013. Value for Money Assessment: Advice Note for Local Transport Decision Makers

Personal Affordability

13.6 At this early stage of appraisal, and for the purposes of this SPOC, an indication of the impact on Personal Affordability has been quantified using the TUBA outputs for vehicle operating costs and user charges (tolls) for non-business users. The results calculated by TUBA are shown in Table 13.3. Note that the Business User benefits were presented within section 11.3.

Table 13.3: Commuting and Others Affordability

User benefits	Commuting	Other	Total
Vehicle operating costs	-30.77	-59.49	-90.26
User charges	0.13	0.09	0.043
Total	**-30.64**	**-59.58**	**-90.22**

*Discounted present values, in 2010 prices and values (£m)

13.7 The results show an aggregate increase in vehicle operating costs over the 60-year appraisal period with an East Coast - Scotland SDC programme of investment in place compared to the Reference case. This is attributable to an increase in total vehicle kilometres travelled and as a result higher fuel consumption and vehicle maintenance costs. The increase in vehicle kilometres travelled is a reflection of the improved connectivity brought about by the SOP highway interventions and an increase to travel to work catchment areas. In doing so the SOP provides the North's residents with increased opportunities to travel for work, leisure and other interests which in qualitative terms is considered to be beneficial from a personal affordability perspective.

13.8 Figure 13.1 shows the distribution of non-business benefits across the SDC area and demonstrates the benefits gained across the corridor. It is noteworthy that the predicted benefits shown relate to the appraised highway SOP interventions in the East Coast alone, and do not reflect the distribution of benefits attributable to the Reference Case interventions, Rail interventions and TfN's full programme of proposed interventions.

Summary

13.9 Table 13.4 below summarises the social impacts. Note that the user benefits and affordability benefits are separated and are not double counted.

Table 13.4: Summary of Social Impacts

Commuting and Other Users	919.76
Reliability impact (Commuting & Other Users)	91.98
Physical Activity	Not Assessed
Journey Quality	Not Assessed
Accidents	Not Assessed
Security	Not Assessed
Access to Services	Not Assessed
Personal Affordability	-90.22
Severance	Not Assessed
Option and Non-use values	Not Assessed

*Discounted present values, in 2010 prices and values (£m)

14 Public Accounts Impacts

Introduction

14.1 This chapter outlines the impact of the East Coast - Scotland SDC programme on public accounts. These form the derivation of two key outputs described below: the impact on the Broad Transport Budget (which forms the cost represented within the Benefit Cost Ratio, BCR), and the indirect taxation impact on Wider Public Finances (HM Treasury (HMT), represented as an adjustment to the benefits within the BCR).

Cost to Broad Transport Budget

14.2 As set out within the Financial Dimension and Chapter 9, the construction, operation and maintenance costs associated with the East Coast SOP have been derived through a robust cost estimation process, referencing industry standard practice and external independent review.

14.3 For the East Coast SOP, all Investment Costs have been assumed to be incurred in 2034, with all Renewal and Maintenance Costs assumed to be incurred in 2035. No profiling of either Investment Costs or Renewal and Maintenance Costs has been assumed within the East Coast economic appraisal.

With reference to the process set out Figure 9.1, Table 14.1 presents the East Coast SOP highways interventions costs in the format of the DfT's CPSS Cost Proforma Summary Sheet. This shows the build-up of the scheme costs from 2017 Base Costs through to 2010 discounted market prices representing the SOP investment costs.

Table 14.1: DfT's CPSS Cost Proforma Summary Sheet

Cost Including	£m	Unit
Base Costs	£1,717.44	2017 prices
Inflation	£2,223.34	2017 prices
Risk	£2,223.34	2017 prices inflated to 2034
OB	£3,160.75	2017 prices inflated to 2034
GDP Deflator	£2,817.86	2017 prices inflated to 2034
Market Prices	£1,234.10	2010 prices
Discounting	£1,468.58	2010 discounted prices
Investment Costs	£1,468.58	2010 discounted market prices

14.4 For Renewal and Maintenance, a value equivalent to 10% of the Investment Costs has been assumed to be representative of the Renewal and Maintenance Costs of the East Coast highway SOP (£146.86m).

14.5 In addition, the Tyne tunnel toll road is in the CEC 'variant' RTM network. The changes in traffic flow and route choice as a result of the East Coast highway SOP causes a slight increase in the use of the toll road as a result of the increased capacity on sections of the A19 to both the north and south of the tunnel and therefore becomes a more attractive route to users. In

the East Coast highway TUBA, toll roads have been set as Local Authority Toll roads, so this increase of users on the toll road results in an increase in revenue received by the Local Authority. This revenue equates to £11.17m over the 60-year appraisal period. In the public accounts table costs appear as positive numbers and revenue appear as negative numbers.

14.6 As shown in Table 14.2, the total cost to the Broad Transport Budget generated by the East Coast highway SOP is therefore £1,604.27m in 2010 discounted market prices.

Table 14.2: Total Cost to the Broad Transport Budget

Cost Including	£m
Investment Costs	£1,468.58
Renewal and Maintenance Costs	£146.86
Local Authority Revenue	- £11.17
Total Cost	£1,604.27

*Discounted present values, in 2010 prices and values (£m)

Indirect Tax Revenues

14.7 Implementation of transport interventions can result in an impact on HM Treasury tax receipts. This results from changes in fuel consumption, from changes in travel distance and/or speed of mode shift to public transport, affecting the fuel duty received by HM Treasury. Table 14.3 provides a summary of the Indirect Tax Revenues as estimated by TUBA.

Table 14.3: Indirect Tax Revenue Benefits

Indirect Tax Revenues	ALL MODES
Wider Public Finances	-152.40

*Discounted present values, in 2010 prices and values (£m)

Summary

14.8 The relevant impacts are summarised in the form of standard DfT 'Public Accounts' tables for the SDC Programme (Table 14.4) under NTEM growth.

Table 14.4: Public Accounts Table for the SDC Programme (NTEM Growth Scenario) (£m discounted market prices)

Public Accounts Table	ALL MODES
Local Government Funding	
Revenue	-11.17
Operating Costs	0
Investment Costs	0
Developer and Other Contributions	0
Grant/ Subsidy Payments	0
Net Impact	**-11.17**
Central Government Funding: Transport	
Revenue	0
Operating Costs	146.86
Investment Costs	1,468.58
Developer and Other Contributions	0
Grant/ Subsidy Payments	0
Net Impact	**1,615.44**
Central Government Funding: Non-Transport	
Indirect Tax Revenues	-152.40
Totals	
Broader Transport Budget	**1,604.27**
Wider Public Finances	**-152.40**

15 Value for Money

Introduction

15.1 A VfM appraisal of the East Coast - Scotland SDC Programme has been undertaken with reference to DfT's Transport Appraisal Guidance[80].

15.2 This chapter brings together the economic appraisal results presented in the preceding sections and considers their inherent uncertainty, other quantified and qualitative impacts, and distributional impacts. The Value for Money (VfM) assessment summarises the monetised and non-monetised impacts of the appraised corridor interventions with; highways, passenger rail and road & rail freight considered separately.

15.3 The chapter concludes by summarising the next steps for appraising the programme level impacts.

Economic Appraisal

15.4 Monetised analyses from the economic, environmental, social and public accounts impacts, from the preceding chapters come together as the Economic Appraisal of the SDC Programme. DfT's BCR represents the ratio:

net-non-transport-budget impacts: net-transport-budget impacts

The latter being represented by the cost to broad transport budget and the former by the sum of all other impacts, as set out in the following text. DfT's second VfM indicator is the Net Present Value (NPV); the sum of all monetised impacts.

Transport Economic Efficiency

15.5 The travel time, cost and financial impacts on consumers and the private sector are summarised in the form of standard DfT 'TEE' tables for the SDC Programme (Table 15.1) under NTEM growth. This table combines the impacts on *Commuting and Other Users* (Social impacts, from Chapter 13) and on Business Users and Transport Providers (Economic impacts, from Chapter 11).

[80] https://www.gov.uk/guidance/transport-analysis-guidance-webtag

Table 15.1: TEE Table for the SDC Programme (NTEM Scenario) (£m discounted market prices)

TEE Table	
Non-Business: Commuting User Benefits	
Travel Time	528.99
Vehicle Operating Costs	-30.77
User Charges	0.13
During Construction & Maintenance	0
Net Non-Business Benefits: Commuting	**498.35**
Non-Business: Commuting User Benefits	
Travel Time	390.78
Vehicle Operating Costs	-59.48
User Charges	-0.09
During Construction & Maintenance	0
Net Non-Business Benefits: Commuting	**331.20**
Business User Benefits	
Travel Time	1,046.60
Vehicle Operating Costs	-29.69
User Charges	0.61
During Construction & Maintenance	0
Net Non-Business Benefits: Commuting	**1,017.52**
Local Authority Provider Impacts	
Revenue	0
Operating Costs	0
Investment Costs	0
Grant/ subsidy	0
Subtotal	**0**
Other Business Impacts	
Developer Contributions	0
Net Business Impact	**1,017.52**
Total	
Present Value of Transport Economic Efficiency Benefits (TEE)	**1,847.07**

Initial DfT Economic Appraisal

15.6 A standard DfT 'Analysis of Monetised Costs and Benefits' (AMCB) table is presented below for the SDC Programme (Table 15.2) under NTEM growth. The AMCB table illustrates the calculation of the initial (Level 1) BCR:

- The Present Value of Benefits (PVB) equals:
  - TEE Impacts (Table 15.1)
  - Monetised Environmental Impacts (Greenhouse Gases from TUBA)
  - Indirect Tax Revenues (from Table 14.3)
- The Present Value of Costs (PVC) equals:
  - Cost to Broad Transport Budget (from Table 14.1)

Table 15.2: AMCB Table for the SDC Programme (NTEM Scenario) (£m discounted market prices)

AMCB Table	
Noise	Not Monetised
Local Air Quality	Not Monetised
Greenhouse Gases	-85.84
Journey Quality	Not Monetised
Physical Quality	Not Monetised
Accidents	Not Monetised
Economic Efficiency: Consumer Users (Commuting)	498.65
Economic Efficiency: Consumer Users (Other)	331.20
Economic Efficiency: Business Users and Providers	1,017.52
Wider Public Finances (Indirect Taxation Revenues)	152.40
Present Value of Benefits **(PVB)**	**1,913.63**
Present Value of Benefits (PVC)	**1,604.27**
Overall Impacts	
Net Present Value (NPV)	**309.36**
Benefit to Cost Ratio (BCR)	**1.19**

Adjusted (Level 2) Appraisal

15.7 The initial (Level 1) BCR presented above does not include monetised Wider Economic Impacts (see Table 10.1); DfT's guidance includes Level 2 impacts[81] within an 'Adjusted' BCR. DfT's VfM guidance sets out VfM categories ranges as follows:

- Very Poor — Adjusted BCR less than or equal to 0.00
- Poor — Adjusted BCR between 0.00 and 1.00
- Low — Adjusted BCR between 1.00 and 1.50
- Medium — Adjusted BCR between 1.50 and 2.00
- High — Adjusted BCR between 2.00 and 4.00
- Very High — Adjusted BCR greater than or equal to 4.00

[81] Chapter 10 – paragraphs 10.10-10.16

Table 15.3 sets out the derivation of Initial and Adjusted BCRs for the East Coast - Scotland SDC Programme under the NTEM Scenario.

Table 15.3: East Coast - Scotland SDC Programme: Initial and Adjusted BCRs

	Initial BCR (Level 1)	Adjusted BCR (Level 2)	
		Lower Bound	Upper Bound
AMCB PVB	**£1,913.63**	**£1,913.63**	**£1,913.63**
Reliability benefits	**NA**	**£196.64**	**£196.64**
Static clustering	NA	£346.00	£371.47
Imperfect competition	NA	£54.57	£54.57
Labour supply impacts	NA	£7.14	£6.93
Present Value of Benefits (PVB)	£1,913.63	£2,517.98	£2,543.24
Present Value of Costs (PVC)	£1,604.27	£1,604.27	£1,604.27
Net Present Value	£309.36	£913.71	£938.97
Benefit Cost Ratio	**1.19**	**1.57**	**1.59**
Value for Money Category	**Low**	**Medium**	**Medium**

*Discounted present values, in 2010 prices and values (£m)

Appraisal Summary Table

15.8 An AST, which allows comparison of the impacts of the SDC programmes under different growth scenarios, is presented as Table 15.4.

Table 15.4: Comparative Appraisal Summary Table

Economy Impacts	
Business user benefits	1,017.52
Reliability impacts on business users	104.66
Regeneration	Strong beneficial
Wider Benefits (Level 2)	407.71 - 432.97
Environment Impacts	
Noise	Moderate adverse
Air Quality	Moderate adverse
Greenhouse Gases *Monetised Impact from TUBA*	Moderate adverse *-£85.84m*
Landscape	Potential to have significant implications for the SOP
Townscape	Potential to have significant implications for the SOP
Historic Environment	Potential to have significant implications for the SOP
Biodiversity	Likely to have significant implications for the SOP
Water Environment	Potential to have significant implications for the SOP
Social Impacts	
Commuting and Other Users	919.76
Reliability impact (Commuting & Other Users)	91.98
Physical Activity	Not Assessed
Journey Quality	Not Assessed
Accidents *MEC Derived Impact*	Not Assessed
Security	Not Assessed
Access to Services	Not Assessed
Personal Affordability	-90.21
Severance	Not Assessed
Option and Non-use values	Not Assessed
Public Accounts	
Cost to the Broad Transport Budget	1,604.27
Indirect Tax Revenues	-152.40

*Discounted present values, in 2010 prices and values (£m)

Value for Money Statement

15.9 The Value for Money (VfM) Assessment summarises the monetised and non-monetised impacts of the appraised corridor interventions. Highways, passenger rail and road & rail freight are shown separately.

15.10 The assessment appraisal undertaken is WebTAG based, utilises industry standard appraisal methodologies and uses DfT traffic forecasts. However, the Reference Case includes scheme which are not committed.

Appraisal of Highway Interventions

15.11 The appraisal of highway interventions in the East Coast - Scotland SDC is set out below in Table 15.5. These are initial results, which will be re-evaluated as TfN take forward further work on modelling and appraising the SDC programme.

Table 15.5: East Coast Value for Money Assessment

East Coast Value for Money Assessment		
Established Monetised Impacts (journey times/operating costs):		
Established Monetised Impacts of appraised highway interventions £1,914m	Net Cost to the Transport Budget of appraised highway interventions £1,604m	Initial Ratio of Benefits to Costs 1.19
Initial Value for Money Category		**Low**
Evolving Monetised Impacts (plus L2 wider impacts/reliability):		
Established + Evolving Monetised Impacts £2,518m-£2,543m	Net Cost to the Transport Budget £1,604m	Provisional Ratio of Benefits to Costs 1.57-1.59
Provisional Value for Money Category		**Medium**
Non Monetised Impacts		
Alignment with Strategic Objectives The East Coast SOP has been developed designed around TfN's main initiatives to develop and enhance connectivity and accessibility in the North, whilst promoting sustainable growth. The SOP has been designed to improve the resilience of the SRN and improve the movement between IECs.		
Other Economy Impacts In addition to the monetised wider impacts above, the East Coast SDC programme has been assessed as having strong beneficial regeneration impacts. It is expected that the SDC programme will improve connectivity by linking businesses closer and it is anticipated that investment in transport infrastructure will result in significant benefits to the North's economy, accelerating, maximising and more-widely distributing the transformational growth and benefits of the major infrastructure investment projects within the reference case.		

East Coast Value for Money Assessment

Other Environmental Impacts

The East Coast SDC programme includes interventions which have potential for adverse environmental impacts within or close to National Parks, Areas of Outstanding Natural Beauty or designated heritage assets. These impacts will be carefully considered in subsequent stages of work and TfN and partners will seek to protect and enhance natural and historic assets, where possible, through the individual scheme development process.

The programme is forecast to increase the number of trips made in the North by road and rail, with former in particular having negative impacts on noise and air quality in addition to Greenhouse Gas emissions. These negative impacts will be offset to a degree through benefits generated by modal shift, as established within the Passenger Rail SPOC (October 2019). At a programme level, the overall net impact is expected to be adverse, but comfortably exceeded by the benefits to the Northern, and UK, economy.

Other Social Impacts

Social Impact assessments have been undertaken at a high level for the programme only, so there is a significant level of uncertainty at this stage and because of this, some assessments have not been undertaken within this SPOC.

Analytical Certainty

The assessment appraisal undertaken is WebTAG based, utilises industry standard appraisal methodologies and uses DfT traffic forecasts. However, the Reference Case includes scheme which are not committed.

TfN's Technical Assurance Group (TAG) have reviewed and approved all methodologies employed within the East Coast and other SDCs economic appraisal and derivation of benefits. The methodology employed is consistent between all SDCs, although TAG updates have been issued in the time since the SDC process started. A sensitivity test on the Level 1 benefits using the July 2019 databook indicates that the Level 1 BCR would increase to 1.22 and hence, would not have a material effect on the outcomes or conclusions of the SPOC.

Scheme costs have been derived through a robust cost estimation process, referencing industry standard practice and external independent review.

The appraisal methodology is therefore considered sound and reasonable for the stage of scheme development which the East Coast SOP is currently at.

Non-monetised Impacts conclusion

At this stage of scheme development, high level environmental assessments have been undertaken, which when considered collectively, suggest a slight adverse effect as a result of the East Coast SOP. A fundamental aim of TfN and Partners is to protect and enhance, where possible, the natural and historical assets of the North

When considering the non-monetised impacts and their potential effect on the derived Level 2 monetised benefits, it is considered **Likely** that the East Coast SDC would drop to be within the **Low** VfM category.

VfM Category	**Poor**	**Low**	**Medium**	**High**	**Very High**
Likelihood	Unlikely	Likely	Possible	Unlikely	Very Unlikely

Taking this into account and given that the lower end of the Adjusted BCR is at the lower end of the BCR category bounds, it is concluded that it would be prudent to set the overall categorisation as **Low Value for Money** following the consideration of the non-monetised impacts.

Adjusted Value for Money Category	**Low**

Appraisal of Passenger Rail Interventions

15.12 The Rail SOP has been developed around TfN's objectives to develop and enhance connectivity and accessibility in the North, whilst promoting sustainable growth. Interventions were defined in accordance with the Desirable Minimum Standards in the draft Long Term Rail Strategy, which have demonstrable alignment to the pan-Northern transport objectives set out in the STP. The SOP has been designed to improve rail connectivity across the North of England.

15.13 The passenger rail economic appraisal is at a northern level, so includes costs and benefits of appraised rail interventions from across the Strategic Development Corridors. Table 15.6 summarises the results of the rail appraisal. It should be noted that for the East Coast-Scotland SDC (and the West Coast-Sheffield City Region SDC), all the rail interventions are included in the non-appraised programme costs category, consequently the VfM Assessment is the same as reported in the Passenger Rail SPOC (March 2019).

15.14 In addition to the monetised impacts in Table 15.6, the Passenger Rail SDC programme has been assessed as having slight beneficial wider economic impacts. While it is anticipated that investment in transport infrastructure will result in benefits to the North's economy, accelerating, maximising and more-widely distributing the transformational growth and benefits of the major infrastructure investment projects within the reference case, these wider impacts have not been assessed at this stage of the study. Further detailed evidence on the Appraisal of Rail Passenger interventions is available in the Passenger Rail SPOC on TfN's website: www.transportforthenorth.com

Table 15.6: Summary of passenger rail economic appraisal

Established Monetised Impacts of appraised rail interventions	**Net Cost to the Transport Budget of appraised rail interventions**	**Initial Ratio of Benefits to Costs**
£464m	**£424m**	**1.10[82]**
Initial Value for Money Category		**Low**

15.15 The figures in Table 15.6 above only cover the rail interventions included in the rail economic appraisal (as outlined in Table 8.2). Table 17.1 in the Financial Case provides an estimate of the funding requirement of all rail interventions (appraised and not appraised).

[82] Based on established monetised impacts only, which focuses on journey time savings to rail passengers, and evaluated using values from the May 2018 WebTAG databook (to ensure consistency with previous SDC appraisals).

Freight Benefits

15.16 The benefits of the SOP interventions for road and rail freight have been appraised using the Great Britain Freight Model and are reported at a GB and a Northern Level. The results, summarised in Table 15.7, provide a strong indication of the economic benefit of supporting freight growth in the North of England.

15.17 The freight scenarios that have been used include looking at the impact of larger ships, warehouse clustering and rail capacity. These scenarios cannot be aggregated together as they rely on particular economic conditions and private sector investment.

Table 15.7: Summary of Freight Benefits of the Strategic Outline Programme

Freight scenario	Present Value Benefits (£m 2010 prices)[83]		
	Allocated to the North	Allocated elsewhere	Total
Benefit of Highways SOP for the North (freight vans)	3,020	170	3,190
Benefit of Highways SOP for the North (HGVs)	844	195	1,039
Benefit of re-routing interventions (Based on 3 alternative rail freight routes)	2,213	3,789	6,002
Benefit of removing all other rail freight capacity limits	1,683	4,080	5,763
Benefit of warehouse clustering	1,886	3,731	5,597
Benefit of Port measures (larger ferries)	761	1,929	2,690

15.18 The approach to assessing freight interventions is detailed further in a separate report available on TfN's website at: **www.transportforthenorth.com**.

Analytical Certainty

15.19 As part of the work on previous SDCs, Transport for the North's Technical Assurance Group (TAG) has reviewed and approved all methodologies employed within the East Coast economic appraisal and derivation of benefits. Highway scheme costs have been derived through a robust cost estimation process, referencing industry standard practice and external independent review.

[83] Benefits cannot be treated as cumulative or added directly to the assessment of highway and rail benefits

15.20 The appraisal methodology is therefore considered sound and reasonable for this very early stage of SOP programme development and is consistent to the previous SDCs for this stage of the business case development.

Summary of VfM

15.21 The costs and benefits demonstrated above show that the transport interventions appraised in our SOP represent value for money based on the evidence currently available, giving a justified basis for progressing the case for investment in this corridor.

Next Steps

15.22 In the next year, TfN plans to update the Strategic Programme Outline Cases to inform an update of the Investment Programme. This will include work on reviewing the current SDCs and Investment Programme, including the sequencing of schemes. The next stage of modelling will include transformational NPIER[84] forecasts and the latest spatial planning information.

15.23 The appraisal will move to a single assessment tool for the North, able to report at pan-Northern and corridor levels, so removing of the issues of double counting of benefits. This approach will also better incorporate the multi-modal impacts of passenger rail and freight.

15.24 The reference case assumptions will be updated, to reflect the latest plans for the schemes such as NPR and Trans-Pennine tunnel.

15.25 The initial work on the wider economic benefits (WITA) will be progressed, moving from Level 2 (static assessment) to Level 3 (dynamic assessment), and include the updates in WebTAG.

15.26 As more definitive scheme definitions emerge, scheme costings will be reviewed, and the environmental appraisal will adopt the more detailed WebTAG methodologies.

[84] Northern Powerhouse Independent Economic Review

Financial Dimension

The Financial Dimension of a business case sets out to demonstrate is to set out the impact of the proposal on public sector capital and revenue budgets.

16 Introduction

16.1 The Financial Dimension sets out the approach to estimating implementation costs for the East Coast - Scotland SDC programme of interventions. 'Whole life' costs are estimated, including ongoing maintenance, periodic renewals and - for Rail Passenger and applicable Freight Road and Rail only - operating costs. These costs, converted into suitable appraisal values, form a key input into the cost benefit appraisal, described in the preceding Economic Dimension.

16.2 The programme-level cost estimating process is necessarily high-level at this time; combining interventions of different scales, natures and complexities. The approach taken has built-in consistency across the programme, effectively implicitly assuming reasonable balance in the variation above/below estimate. There are further advantages of programme delivery at this scale in respect of cost estimates; principally in terms of the ability to refine the programme as experience is accumulated and lessons are learnt, for example improving the efficiency of procurement and adjusting intervention delivery timings and specifications to maximise value for money.

Approach to Financial Appraisal

Highway Intervention Costs

16.3 Initially, the unit rate-based approach developed for the Major Road Network report was adopted. This methodology was reviewed and approved by both TAG and the Department for Transport (DfT). Notwithstanding, it was decided that owing to the complexity of some of the SDC SOP schemes there would be benefit from additional external assurance. Accordingly, TfN commissioned an independent review of the unit rates alongside a more detailed costing exercise for a small number of schemes across each of the previous SDCs.

16.4 This review concluded that the unit rate methodology was sound and provided updated unit rates, drawn from industry knowledge and records of scheme cost information, including some which was not publicly available. The updated unit rates were accepted by TfN for use in this SPOC.

16.5 The sample SDC schemes were costed using a methodology consistent with Highways England's strategic-level estimating process which incorporated all construction costs, design and preparation, land costs, enabling works,

supervision, statutory undertakers and third-party infrastructure costs. This provided a 2017 'scheme base cost' on top of which factors were applied to represent Project Risk and Uncertainty. The risk allowances applied are consistent with Highways England submissions.

Rail Intervention Costs

16.6 A similar 'unit cost' based approach was adopted for rail schemes, with unit rates in this case based initially on publicly available data. For route improvements, unit rates per mile were derived for bands based on the journey time saving, as a proportion, identified. Costs for new or substantially upgraded intermediate stations were also derived. Network Rail and DfT Rail were consulted about these rates, the cost per intermediate station being increased as a result. No other amendments to the rates were suggested, or alternative evidence provided; it is therefore assumed that cost estimates based on these rates are appropriate for the current stage of delivery.

Freight Intervention Costs

16.7 Freight intervention costs have not been developed at this very early stage of work[85].

Inflation

16.8 Convention for the Financial Dimension is to present costs in nominal terms (sometimes referred to as outturn or cash terms), that is inclusive of all inflation. Intervention cost estimates have been inflated to 2035 using BCIS cost inflation indices, for the purposes of the Economic Dimension - where interventions have been represented as being implemented in a single year. Further inflation has been applied to costs presented within this Financial Dimension, to represent in broad terms the anticipated phasing of intervention delivery.

17 Implementation Funding Requirement

Funding Requirement

17.1 The illustrative Strategic Development Corridor funding requirement for appraised (within the economic appraisal) and non-appraised interventions is shown in Table 17.1. The indicative costs which underline the funding requirements are based on high level benchmarked unit rate cost estimates appropriate to this early stage in the business case development cycle.

17.2 This represents an ambitious but realistic funding requirement for a long term programme of transport investment, building upon the reference case schemes, to be delivered over the period up to 2050.

[85] Other general highway intervention costs that would benefit road freight traffic are included within the highway cost assumptions

17.3 Following the structure of the SPOC documentation, costs for highway interventions are provided for each of the separated SDC corridors, whereas passenger rail intervention costs are presented at a combined northern level.

Table 17.1: Illustrative Funding Requirement (£m in 2017 prices)

SPOC	Appraised Programme	Non-Appraised Programme	Full Programme
Highway: Central Pennines	£7,144	£334	£7,478
Highway: Energy Coasts	£2,158	£170	£2,328
Highway: Southern Pennines	£3,115	£583	£3,698
Highway: West and Wales	£3,281	£1,578	£4,859
Highway: East Coast - Scotland	**£1,717**	**£653**	**£2,371**
Passenger Rail: North	**£505**	**£6,991**	**£7,496**
Sub-Total[86]	£15,682	£10,119	£25,801
TfN Programme Level Contingency (5%)			£1,290
Total Base Cost (including programme contingency)			£27,091
Illustrative Funding Requirement (allowing for inflation)	£40,000 to £50,000		

Funding Arrangements

17.4 A key element of the STP will be how the infrastructure proposed by TfN, as set out in the Long Term Investment Programme (LTIP), will be funded over the period until 2050. TfN has therefore developed a Funding Framework that will form the basis of the funding section of the STP as well as informing the business cases for Northern Powerhouse Rail (NPR) and the interventions arising from the work on the SDCs.

17.5 The approach that TfN has adopted to the development of the Funding Framework has been grounded in the fundamental principles that were

[86] Double counting of interventions in more than one SDC removed.

agreed by the Partnership Board in December 2016. KPMG was appointed in June 2017 to support TfN in this work.

17.6 The TfN Funding Framework was discussed at the Partnership Board on 31 July 2018 and amended to reflect the comments made by the members. In addition, it was presented to the Scrutiny Committee meeting on 30 August 2018, where it was endorsed and recommended for approval by the TfN Board (noting that it will need to consider the more detailed proposals as and when these are developed).

17.7 The TfN Funding Framework includes the following elements:

- The Principles – which underpin a deliverable and appropriate funding arrangement
- The Potential Funding Sources – demonstrating that TfN's funding requirement is reasonable
- The Governance Arrangements that will enable funding allocated for strategic transport infrastructure in the North to be directed to TfN programmes
- How Financial Risk is managed.

17.8 The Funding Framework also sets out the parameters within which the allocation and management of the financial resources required to deliver the objectives of the STP will be undertaken.

17.9 The key points to note within the TfN Funding Framework are as follows:

- The total funding envelope identified by TfN is deliverable within the context of a reasonable expectation of what funding might be made available. This is consistent with the National Infrastructure Commission's position as set out in the National Infrastructure Assessment. TfN is therefore not making unreasonable financial demands on central government – the decision to fund TfN is a choice that can be made by government within existing paradigms, based on robust programmes.
- TfN does not have the power to capture value created by its promoted interventions – where these powers do not sit nationally, they sit locally with TfN's Constituent Authorities or other local authorities. These local authority powers have principally been granted to fund activity on a local rather than a regional basis. Where local plans are sufficiently developed, it is likely that those local powers will be fully utilised funding transport infrastructure within authorities and cannot be relied on to fund strategic (i.e. national) infrastructure.
- The TfN Funding Framework will be integrated with the pipeline of programmes and projects that is presented by TfN in the STP and the accompanying LTIP. Further work is required to understand the impact of the timing of those projects and the resultant profile of proposed funding through to 2050, although there has been some initial work done for the pre-2027 period.
- The TfN Funding Framework also identifies where residual risks sit in relation to the funding of TfN promoted interventions and how this will

be managed. Neither TfN nor its Constituent Authorities are in a position to backstop the risks associated with TfN's proposals and therefore as things stand this role will need to be taken on by central government. However, TfN could become the owner of programme risks, which would mirror some of the effects of financial risk taking.

17.10 In the longer term, the TfN Funding Framework will provide the basis for further detailed work that will include the following activity:

- Engage with DfT, HMT and central government more widely to agree and define exactly what form the proposed budgetary decision-making control would take and demonstrate how it would enhance delivery of infrastructure in the North.
- Engage with Members and other stakeholders to further understand their ambition and consider any consequential impacts on TfN governance arrangements.
- Develop the detail of the proposed funding powers and associated risk management mechanisms and how these might be delivered.
- Consider how these powers and responsibilities would impact on TfN and its Constituent Authorities (including an assessment of potential financial impacts) and in particular, any additional resources that might be required to discharge them.
- Consider how the proposed changes would impact on DfT, partner bodies (including delivery agencies), and identify how new processes could be adopted (including the transition to the proposed arrangements).

18 Operational Life Funding Requirement

Introduction

18.1 In addition to the implementation costs (above) cost benefit appraisal takes account of future costs for maintenance and renewal, for example the delivery of additional infrastructure may place additional liabilities on the public sector to keep it in operational condition.

Maintenance and Renewal

18.2 A present value equivalent to 10% of the implementation costs is applied, to represent highway maintenance and renewal costs, based on experience from across the project team. This is assumption is to be appropriate given the current stage of delivery.

18.3 The same adjustment, equivalent to 10% of implementation costs in present value terms, was made to represent passenger rail and freight intervention maintenance and renewal costs for consistency with highway schemes.

Operating Costs and Revenue

18.4 A high-level estimate of rail operating costs was made based on changes in service km, noting that neither operating costs nor passenger revenues were included in the rail economic appraisal. This represents a prudent assumption, based on the constraint that revenue from any rail interventions must exceed service operating costs.

Commercial Dimension

The Commercial Dimension of a business case sets out to demonstrate that the proposals are commercially viable, outlines the applicable procurement options and introduces the approach for engaging with the market.

19 Introduction

19.1 The Commercial Dimension sets out the procurement strategy to engage the market and the proposed approach to risk allocation. Given the programme is at a relatively early stage, this Commercial Dimension seeks to further clarify Transport for the North's (TfN's) role in procurement and risk acceptance, demonstrate that the various procurement options available and market capability are being considered, and establish that there is a clear procurement approach in place to deliver, as a minimum, the next phase of the study. The Commercial Dimension will be developed in further detail at Strategic Outline Business Case (SOBC) and Outline Business Case (OBC) stage.

19.2 The shortlist of interventions in the East Coast Strategic Development Corridor (SDC) forms a divisible programme of works. This provides flexibility in the scale and timing of delivery of the interventions. Given this flexibility, many routes to market are available. Due to the programme being both multi-modal and structured around a series of packages, it is likely that a number of separate scheme promoters and delivery contracts will be required, including both engineering contracts and franchise commitments for rail. Given the anticipated timescales for delivering such significant interventions, it is likely that the procurement options available to the scheme promoters, particularly in terms of specific contracts, will change during the lifecycle of the project. Therefore, the commercial and procurement strategy will evolve as the scheme design/scope develops.

20 Approach to Procurement

Procurement Regulations Context

20.1 Department for Transport (DfT), TfN and the delivery partners procure works and services in compliance with EU Procurement Directives and UK Regulations. DfT, TfN, Highways England and HS2 Ltd procure through the Public Contract Regulations whilst Network Rail qualifies as a Utility Company under the EU Utility Directive and procures works and services through the Utilities Contract Regulations.

20.2 For bespoke procurements, where the requirements are out of the scope of the frameworks, TfN and delivery partners undertake discrete Official Journal of the European Union (OJEU) compliant procurements.

20.3 Looking ahead, future work and services with respect to the SDCs will be procured by the agreed delivery body. TfN will lead on further business case development at the Pan-Northern / SDC level. Beyond that stage works and services will be agreed and taken forward by the appropriate delivery entity, yet to be determined. For example, this could include Highways England for Strategic Road Network (SRN) schemes, Network Rail and Local Transport Authority partners.

Market Assessment

20.4 This section provides an overview of the capabilities and capacity of the supplier market, any gaps which exist between current capabilities and those likely to be required to deliver the programme, and considerations for engaging with the market prior to procurement. Market analysis is a key aspect, both in terms of informing the scheme design, operational/ maintenance requirements and the route to procurement. As the study moves forward, it will be critical to remain at the forefront of market developments, understanding lessons learnt from other major schemes as well as gaining an appreciation of who in the market has the capability to deliver the interventions and packages. The skillsets required to implement the schemes are similar to those required for other regional and national highway and rail projects.

20.5 The divisible nature of the programme provides flexibility if necessary to fit supplier availability. However, it is noted that TfN's wider programme is large and includes many interventions that will need to be delivered contemporaneously, including with large committed investments promoted and delivered nationally or otherwise outside TfN. TfN will work closely with delivery agencies as well as the broader transport industry to ensure a joined-up approach to skills. In delivering the Investment Programme, the focus will be on maximising social value for local areas, a sustainable pipeline of skills, and diversity within the workforce.

20.6 Where capability or capacity gaps are identified, options will be suggested for addressing them. These options could take broadly two forms:

- Increasing capability/capacity to close any gaps, including;
  - Working alongside the market and further education establishments to address skills gaps and release new capacity into the market.
  - Collaborating with the private sector to enhance innovation.
- Reducing/reprofiling the requirement to be deliverable by the existing market; including;
  - Working with infrastructure owners to identify more efficient way of working (for example enabling lengthier access to rail infrastructure or combining enhancement work with routine maintenance/renewal activity.)

20.7 It is likely that a combination of these actions will be necessary.

20.8 The timing of the interventions (see Management Case) provides an opportunity for scheme promoters to ensure suppliers offer the correct skillsets as new framework and term maintenance contracts are let. More detailed market analysis will be undertaken as part of the next stage and updated as technologies in construction and within the complementary industries develop.

Sponsorship/Procurement Options Available

20.9 The multi-modal and divisible nature of the East Coast programme provides an opportunity to select the best sponsorship and delivery model for each intervention/package of interventions.

20.10 Project sponsorship options include:

DfT

20.11 Under this option, DfT would retain sole accountability for the governance of a project and for ensuring that it meets the objectives set out in the Strategic Dimension. A close working relationship with the delivery agent will be required, with clearly defined processes for decision-making, communications and escalation. Dependent on the preferred delivery model (see below), this option would have the advantage of building from prior experience and utilising an existing toolkit of project processes. DfT would require a means of monitoring that the long term critical success factors (that is, making a positive contribution to the economic growth of the North of England).

TfN

20.12 Here, TfN would take sole accountability for the success (in terms of meeting both the short and long-term objectives) of a project, and take on the day-to-day Sponsor role during delivery of the infrastructure elements of the project. The advantages of this option include the geographic proximity of TfN's operations to the project site, the key linkages between the project's objectives and those set out in TfN's [draft] Strategic Transport Plan, and the existing communications processes between TfN and its partner authorities as key stakeholders.

DfT & TfN Joint Sponsorship

20.13 In this option, DfT and TfN would take on a joint Sponsorship role, collectively owning the business case and accountability for delivery of project objectives. This option has the advantage of being able to utilise DfT's organisational experience and tools, and TfN's communications management structures and North of England base. It also provides an opportunity for TfN to gain project Sponsorship experience without taking on sole accountability. A clear plan would be required setting out individual roles within the sponsorship team and lines of decision-making and escalation, to mitigate any risk associated with joint sponsorship.

TfN Local Transport Authority Partner Sponsorship

20.14 Following the principle of subsidiarity, where a TfN Local Transport Authority partner is best placed to act as Sponsor TfN will work with that Local Transport Authority to support further business case development, management of and delivery of an intervention or package of interventions. This approach is most likely to be a preferred option for interventions on local transport / highway authority managed roads.

Private Sector Sponsorship

20.15 There could also be opportunities for private sector investment within the Programme, such as market-led rail proposals and a number of combined transport and energy proposals. Transport for the North will examine each of these proposals closely as and when the necessary information is available.

20.16 Delivery options include:

- Commissioning via agencies (Network Rail, HS2 Ltd and Highways England);
- Direct contractor appointment;
- Alternative mechanisms (franchising, alliancing, ODP)
- Commissioning via TfN's Partner Authorities

Design, Build & Maintain (Network Rail/HS2 Ltd/Highways England)

20.17 Under the Design, Build & Maintain model, the Sponsor would appoint an agent responsible for completing [detailed] scheme design and subsequent construction. Traditionally, Network Rail has undertaken this role for DfT, utilising [sub-]contractors where required. In this respect this option has the advantage of utilising a 'tried and tested' method, without the risks associated with a more innovative approach. It would also enable the 'lessons learned' from the delivery of recent enhancement projects to be embedded within the process for planning and delivering this scheme.

20.18 It is anticipated that many of the interventions will be delivered through framework and term maintenance contracts held by Network Rail, local authorities and Highways England.

20.19 It is likely that the schemes within the East Coast programme would not fall within the extant CP5 process for managing the delivery of enhancements. This creates a number of options for allocating key roles of project sponsor and delivery agent. A brief description of each option is set out below to inform further discussion.

Assurance

20.20 While not all interventions within the programme fall within the remit of Highways England and Network Rail, at this stage it is assumed that assurance stages will be consistent with the Highways England's Project

Controls Framework (PCF)[87] and Network Rail's Rail Network Enhancement Pipeline (RNEP) processes, as relevant by intervention/ package. These frameworks set out how Highways England and Network Rail, together with the DfT, manage and deliver major projects in phases/stages and are described in more detail in the Management Case. Both processes require a phased approach to procurement and approval, which can be applied separately by intervention/package as the programme moves through to later stages.

20.21 The process map (Figure 20.1) below shows how the Strategic Transport Plan will provide the multi-modal, strategic outline programme for the interventions that feature in the Investment Programme in line with current industry and regulatory processes:

[87] https://s3.eu-west-2.amazonaws.com/assets.highwaysengland.co.uk/roads/road-projects/A12+Chelmsford+to+A120/The+Project+Control+Framework+Quick+Reference+Guide+v1+February+2017.pdf

Figure 20.1: Investment programme development process

Next Phase

20.22 The work on the Strategic Development Corridors is providing enhanced analysis and strategic programme cases for investment for each corridor, as well as an initial value for money assessment for the preferred package of interventions.

20.23 The interventions listed will then need to be subject to their own assessment and business case developments, either as individual schemes or, in the case of the rail journey time improvement programme, as a sub-programme, by the relevant Delivery Partner or scheme promoter, following the Rail Network Enhancement Pipeline or Highways England's Project Control Framework processes. These will all then align with the steps required for a HM Treasury compliant business case.

20.24 The new evidence, analysis and appraisal tools will be made available for scheme promoters to support the development of interventions, ensuring that Transport for the North is adding value to the process.

20.25 Transport for the North will work closely and collaboratively with Government and all Delivery Partners to ensure that this Investment Programme is delivered.

20.26 Transport for the North co-manages the Northern and TransPennine Express rail franchises, ensuring that the provisions of the two franchise agreements are delivered. Transport for the North is also delivering the Integrated and Smart Travel programme over the coming years.

Market Engagement

20.27 DfT, TfN and delivery partners have established procurement frameworks and, as mature clients, have long term relationships with their suppliers. Each organisation uses its market intelligence to inform their strategy for procuring works and services.

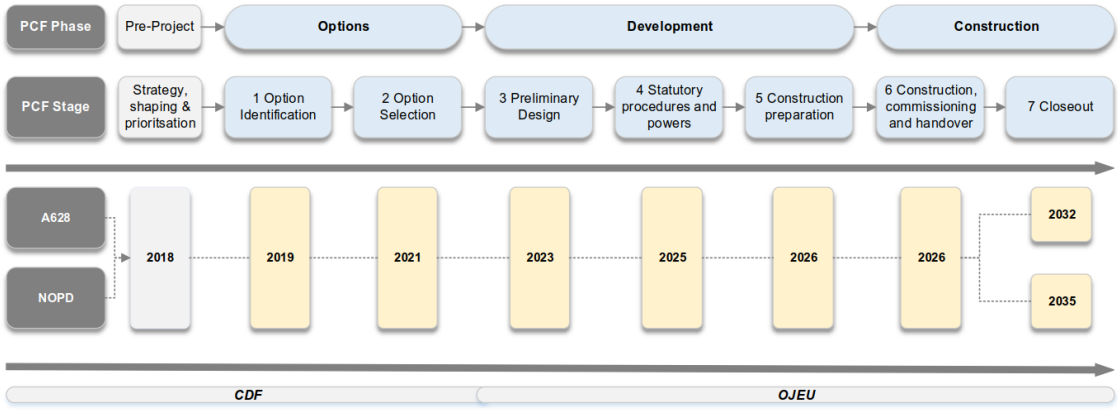
20.28 TfN encourages potential suppliers to register their interest using a form on the TfN website. TfN retains these contacts so that when projects are ready for launch, a potential supply chain is already in place.

20.29 For complex tenders, TfN regularly invites bidders to Supplier Engagement meetings at which bidders learn about what TfN is trying to achieve and is also an opportunity for bidders to input into the Specification and the Procurement tender plan.

Procurement timelines

20.30 Figure 20.2 illustrates the anticipated procurement timeframes, commencing with further programme refinement and SOBC development.

Figure 20.2: Example from Trans-Pennine Tunnel Study (HE/TfN/DfT)



21 Next Steps

21.1 TfN will lead on further business case development at the Pan-Northern/Strategic Development Corridor level, including seeking and prioritising funding for schemes. Beyond that stage, works and services will be procured by the appropriate delivery entity, yet to be determined. For example, this could include Highways England (for Strategic Road Network schemes), Network Rail and local transport authority partners.

Management Dimension

The Management Dimension of a business case sets out to demonstrate that the proposals are deliverable, including describing proposals for:

- Programme governance
- Stakeholder engagement
- Risk and opportunities management
- Monitoring and evaluation

22 Introduction

22.1 The Management Dimension assesses whether a proposed intervention is deliverable. It provides a clear understanding of what needs to be done, why, when and how, with measures in place to identify and mitigate any risks[88].

22.2 This section provides a high-level outline of the programme governance and the management systems put in place to oversee the development phase of the programme of investments. Additionally, this dimension presents an overview of the programme and the approach to stakeholder engagement, risk management and monitoring and evaluation to ensure the successful delivery of the programme.

22.3 As illustrated in the Strategic Dimension, the proposed programme will be a large range of multi-modal interventions varying in scale and scope distributed along the East Coast corridor. Therefore, the programme will most likely be delivered in distinct phases. This approach will include a number of early 'priorities for delivery'.

23 Programme Governance

Introduction

23.1 This section describes the governance arrangements necessary to oversee the Strategic Development Corridor (SDC) programme at various stages in its lifecycle.

[88] DfT. (2013). The Transport Business Cases. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/85930/dft-transport-business-case.pdf [Accessed: 26/09/2018]

Governance Structure

23.2 As the body responsible for managing issues at a strategic level across the North, Transport for the North (TfN) is leading the development of a multimodal package of schemes to implement in the East Coast corridor. The Strategic Programme Outline Cases (SPOC) for the SDCs provide a key part of the evidence base for TfN's Strategic Transport Plan (STP) and Long Term Investment Plan (LTIP). This sets out TfN's proposals for investment in transport across the North.

23.3 TfN, as the statutory transport body for the North, is the voice of the North of England for transport - a partnership of elected and business leaders from across the whole of the North of England who collectively represent all of the region's 16 million citizens.

23.4 An overview of the governance structure is shown below in Figure 23.1.

Figure 23.1: SDC Governance Structure[89]

23.5 Reflecting TfN's governance arrangements, partners have been engaged and have contributed to the development of the Strategic Outline Programme (SOP) for this corridor throughout its lifecycle. This includes

[89] As of June 2019, Strategic Transport Plan Programme Board was renamed as the Strategic Oversight Group (SOG)

participation and approvals during scheme identification, objective setting, sifting, option refinement and economic appraisal processes.

23.6 The Partnership Board has agreed on the governance structure for TfN including the establishment of an Executive Board including TfN and DfT to oversee the work of individual work streams. Programme boards and delivery groups have also been created to advise and support the work of the Partnership Board and its Committees.

23.7 The Programme Board includes representatives from the following organisations: Combined Authorities, Local Transport Authorities and Local Enterprise Partnerships in the North, Department for Transport, Network Rail, Highways England, High Speed 2 Ltd. This board has provided direction, technical scrutiny and oversight throughout the development of the proposed set of interventions.

Roles & Responsibilities

23.8 The SPOC for the corridor provides a key part of the evidence base for TfN's Strategic Transport Plan and Long-Term Investment Plan, which sets out TfN's proposals for investment in transport across the North.

23.9 Setting clear roles and responsibilities and single point accountability for different areas of work is vital to supporting effective project planning, delivery and decision making.

23.10 TfN is accountable for owning the vision for the proposed programme and integrating and aligning it with the wider TfN Strategic Transport Plan, the wider Northern Powerhouse agenda and key government strategies.

23.11 TfN will provide the overall direction, governance and leadership, including chairing the Programme Board, further developing, refining and sequencing the package of interventions to facilitate the implementation of the proposed programme. TfN’s role is overarching, in order to maintain a healthy alignment between the programme and wider Departmental and Government strategies, while engaging with HM Treasury, Cabinet Office, Infrastructure and Projects Authority and other key governmental stakeholders. TfN will also be responsible for managing the key strategic risks facing the programme and ensuring that the views of the local authority partners are represented.

Programme Management Arrangements and Assurance

23.12 Within TfN, as the Senior Responsible Officer (SRO), the Major Roads Director is accountable for delivery of the SDC Strategic Outline Programme Case (SOP).

23.13 Following completion and TfN Board endorsement of the Strategic Programme Outline Case, TfN will maintain responsibility for owning and promoting the SDC programme. This will include the completion of further development work during 2019/20 to refine, package and sequence the proposed delivery of the Strategic Outline programme.

23.14 Through the governance structure TfN will work with partners to review and update the STP LTIP, and to determine which partner organisation will take lead responsibility for progressing business case development for specific interventions or packages of interventions.

23.15 As stated in the Commercial Dimension, assurance processes will be consistent with Highways England and Network Rail where relevant. These include Highways England's 'Project Control Framework' (PCF)[90] and Network Rail's 'Governance for Railway Investment Projects' (GRIP) processes. According to these frameworks, a programme lifecycle needs to be clearly defined, broken into phases and structures around key milestones. Approval to proceed from one stage into the next must be given by the Senior Responsible Owner (SRO) and this is assessed at a stage gate assessment review (SGAR). The application of these proven 'Codes of practice' will ensure the effective assurance of the proposed programme of interventions.

24 Programme Lifecycle and Sequencing

Introduction

24.1 The proposed programme of interventions across the East Coast - Scotland SDC comprises multi-modal investments to be delivered over time. The delivery of these schemes will require a comprehensive plan that carefully phases investment to ensure affordability, whilst balancing disruption, mitigation and enhancement of environmental impact and the realisation of benefits to the residents and businesses of the North of England. The interdependencies with committed schemes such as HS2 and programmed road schemes are also a key factor to consider when developing the delivery plan.

24.2 This section presents the emerging delivery programme for the East Coast - Scotland SDC.

Outline Delivery Programme

24.3 The programme of investments proposed for the East Coast corridor includes a large number of schemes, which will likely be delivered over a number of years. This programme is in early stages of development and therefore this Management Dimension focuses on the development phase.

24.4 It is envisaged that a number of early 'priorities for delivery' will be taken forward to Strategic Outline Business Case (SOBC) in 2019/2020 to be delivered between 2020-2027. Overall, a programme of short (up to 2027), medium (2027-2035) and long term (post 2035) interventions will be developed.

[90] Highways England (2017), The Project Control Framework Quick Reference Guide

Figure 24.1: High-level delivery programme

24.5 In the next year, TfN plans to update the Strategic Programme Outline Cases to inform an update of the Investment Programme. This will include work on reviewing the current SDCs and Investment Programme, including the sequencing of schemes. The next stage of modelling will include transformational NPIER forecasts and the latest spatial planning information.

24.6 As in the first stage of the development of the SDCs, TfN will fully engage with DfT, local partners. national delivery bodies, transport operators and other key stakeholders. This will ensure that partners and stakeholders contributions inform and help shape our delivery programme.

Interfaces with other schemes

24.7 As the programme is further developed, it will be key to consider how the proposed interventions interface with other schemes being planned for this geographical area. Key schemes to consider will include:

- HS2
- Great North Rail Project
- Highways England Road Investment Strategy 2 investments (Manchester North-West quadrant, Trans-Pennine Tunnel)
- Northern Powerhouse Rail
- Other major developments of national and regional importance
- Local schemes

24.8 The full list of schemes included in the Reference Case is available in the Strategic Dimension.

25 Stakeholder Management and Communications

Introduction

25.1 Effective stakeholder management and consultation is fundamental to achieving the objectives of the programme. This section presents an overview of TfN's engagement with key stakeholders so far as well as an overview of TfN's approach to future stakeholder engagement and communications.

Stakeholder Engagement Plan

25.2 At the start of the development of the SPOC, a Stakeholder Engagement Plan (SEP) was produced to map stakeholders and agree a communications plan throughout the option development process and preparation of the SPOC.

25.3 The SEP included:

- Aims and objectives
- Situation analysis
- Stakeholder mapping
- Engagement methods

25.4 Since the start of the development of the programme of investments in the East Coast - Scotland SDC and following the SEP, TfN has engaged with a significant number of national, regional and local stakeholders. These include:

- Local authorities
- Local Transport Authorities
- Local Enterprise Partnerships
- Combined authorities
- Highways England
- Network Rail
- HS2
- DfT
- Homes England
- Large private businesses, including rail and airport operators
- Railfuture
- Community Rail Partnerships
- Historic England
- Transport Focus
- Chambers of commerce and other organisations representing businesses
- Tourism organisations

25.5 The purpose of this engagement was to define the outcomes to be achieved through investments in the SDCs and identify which multi-modal solutions are required to deliver these outcomes.

25.6 TfN held different stakeholder consultation sessions in the form of workshops and interviews throughout 2018. Details on the specific consultation sessions held to inform the options development and assessment process can be found in the Strategic Dimension. Further rounds of stakeholder engagement are planned in 2019 to share the outcomes of the SPOC.

26 Risk and Opportunities Management

Introduction

26.1 The SDC's risk management is undertaken in line with TfN's Risk Management Strategy (RMS). The RMS provides a framework for managing risks in a consistent manner by applying systematic methods and practices to the task of identifying and assessing risks and opportunities which in turn allows mitigation measures to be identified and implemented to reduce or optimise the effects. This provides a disciplined environment for proactive decision-making.

Risk Management

26.2 The risk management approach is an iterative process through which risks are continually identified, assessed and managed by the programme team. Adopting best practice, TfN's risk management process is sub-divided into six key steps listed below:

- Contextual Analysis
- Identification of Risk
- Risk Evaluation
- Risk Analysis
- Risk Treatment
- Monitor & Control

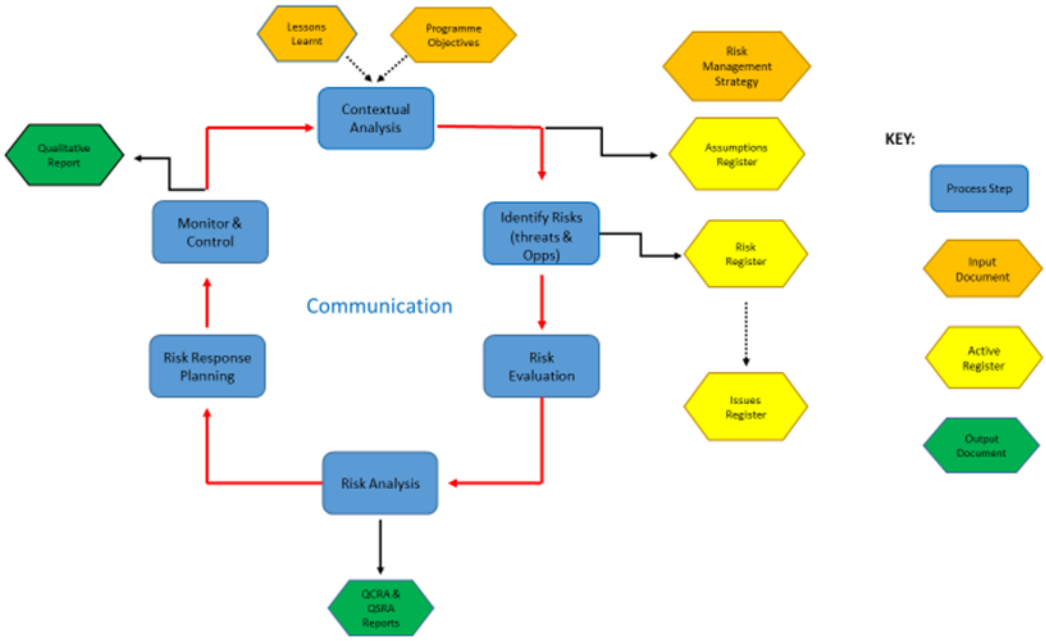
26.3 Collectively, these steps form a logical sequence, necessary for the adoption of a robust approach to the implementation of the risk management with the SDC programme.

26.4 The SDC team maintain an up-to-date programme risk register, which is reviewed and updated regularly and an on-going basis by risk and mitigation action owners. The programme has adopted a robust and rigorous bottom-up risk management reporting where emerging risks are proactively captured, existing risks reviewed and re-assessed, and new risks identified.

26.5 TfN's efficient and effective risk reporting process allows management to be informed on the key threats and opportunities that require attention at a higher level.

26.6 Figure 26.1 provides an overview of TfN's risk management process. A description of key stages is provided below.

Figure 26.1: TfN's Risk Management Process



Contextual Analysis

26.7 This step requires the manager to collate the maximum amount of information with regard to the scope of the activity, thus enabling the identification of risks that may have an impact upon TfN's objectives. Information collated will assist in defining appropriate probability and impact scoring.

Identification of Risks

26.8 TfN will undertake a comprehensive contextual analysis to enable the identification of risks that may have an impact upon TfN's objectives. Based on the contextual analysis, threats and opportunities will be identified that inform the risk identification process. Identified risks will be summarised in a risk register which includes risk categories and risk descriptions. TfN will organise a comprehensive programme risk register and regularly update it with emerging risks being proactively captured.

Risk Evaluation

26.9 The programme team will utilise designed a qualitative risk scoring criteria to enable the assessment of the risks and opportunities. This will generate a qualitative risk ranking (risk score) by multiplying the probability with the maximum of the impacts for each risk identified in the risk register. The risks with the highest risk scores will be prioritised analysed in more detail and reported for review and decision-making.

Risk Analysis

26.10 Risk analysis will be undertaken to determine the aggregated effect of the threats and opportunities on an activity. This will include consideration of any interdependencies or mutual exclusivity between risks.

Risk Treatment

26.11 For risk treatment/mitigation, a process for selecting the most suitable response strategy to the management of individual or groups of risks will be chosen. These are applied to both threats and opportunities. Appropriate ownership will be identified in the risk register for all risks, together with the associated mitigating actions.

Risk Monitor and Control Stage

26.12 This is an essential process step by which the risk planning measures are monitored and controlled. Usually conducted as part of regular risk reviews. The output of this process step will allow for corrective action to be taken should the risk planning measures be judged as not working effectively and thus further actions may be required.

27 Monitoring and Evaluation

Introduction

27.1 The monitoring and evaluation of benefits is required to assess the extent to which the scheme meets its core objectives as set out in the Strategic Dimension. TfN in consultation with partners, will develop a thorough monitoring strategy and evaluation plan complying with DfT (HMT) requirements[91]. This is an important task to understand the benefits of the programme of interventions, highlighted in DfT and HMT guidance.

Approach to Monitoring and Evaluation

27.2 Monitoring is the systematic collection and analysis of data as a project progresses, aimed at improving the efficiency and effectiveness of a project or organisation. This data can be fed back into implementation, current decision making and the appraisal process to improve future decision making. It requires the collection of data before implementation to act as a baseline.

27.3 The monitoring strategy for this programme will set out data requirements, potential data sources and how the data will be obtained and monitored at the start of the project (baseline) at various intervals during the project (milestones) and at the end of the project (target) to help assess the trajectory of outputs and impacts.

[91] HM Treasury. (2018). A short 'plain English' guide to assessing business cases.

27.4 The evaluation plan, to be developed as the programme development progresses, will describe in detail the proposed evaluation approach and how it fits with the existing evidence base and monitoring strategy. The plan will be developed following guidance contained in the Magenta Book[92], the Government's guidance on evaluation. All interventions will require a decision on whether to carry out a formal independent evaluation or not. This decision will be based on the scale of the investment and the need for evaluation[93]. The evaluation plan may draw on existing evaluation processes where relevant, for example Highways England's Post Opening Project Evaluation (POPE) for road schemes.

27.5 To date TfN has undertaken some work into monitoring the current economic baseline across the North as evidenced in the Northern Powerhouse Independent Economic Review (NPIER) and the STP. More work will be undertaken as the programme for investment in the SDCs develops. As TfN develops its process for monitoring and evaluation it is important that an assessment is made against the current metrics available to critically assess measurement validity.

Benefits monitoring and realisation

27.6 Transport for the North will also develop a benefits realisation strategy in the next phase. This will ensure that the key objectives for the scheme, as laid out in the Strategic Dimension, are met. An effective benefits realisation strategy will include:

- Creation of a benefits register that links the expected benefits from the programme to the overall strategic goals. This would include identification of the benefit and the proposed metric that will be used to measure it (for example, time savings, overall demand figures, etc).
- Nomination of the organisation or directorate that is accountable for realising the benefit. In some cases, such as public realm improvements or specific local interventions, this may be an organisation other than TfN such as local authorities.
- Arrangements for ensuring that benefits monitoring is at the heart of scheme decision-making.
- Monitoring and updating, to ensure that the benefits are on-course to be realised.
- Consideration of how benefits from each individual scheme can be isolated and properly evaluated.

[92] HM Treasury. (2011). The Magenta Book

[93] DfT. (2013). Monitoring and Evaluation Strategy

28 Management Dimension Summary

28.1 This chapter has discussed the deliverability of the proposed programme of interventions for the East Coast corridor. It demonstrated that plans and governance structures are in place, as well as how they might change in future. It has also included a description of the arrangements for engaging with internal and external stakeholders and those for managing risks.

28.2 The Management Dimension also highlights the importance for effective risk management and monitoring and evaluation. Finally, the methodology for monitoring and evaluation of benefits was described. This is necessary to assess the extent to which the scheme meets its core objectives as set out in the Strategic Dimension.

Glossary

Term	Acronym	Definition
Benchmark		**Benchmark Estimating Ltd** : company who undertook the 'benchmarking' exercise on the scheme costs
Concept		High level approach to delivering interventions (for example an offline bypass.
Enabling Capabilities		The capabilities of the North which are additional to the prime capabilities: education; financial and professional services; and logistics.
Garden Village		A self-contained community of between1,500 and 10,000 homes.
Gross Value Added	GVA	The measure of the value of goods and services produced by an area, industry or sector of an economy.
Intervention		A potential (loosely defined) scheme which would deliver a benefit.
Local Enterprise Partnership	LEP	A voluntary, business-led, strategic partnership between local authorities and businesses, responsible for promoting and developing economic growth.
Major Road Network	MNR	A network of economically important roads vital for transformational growth
Northern Powerhouse Independent Economic Review	NPIER	Outlines the opportunities to transform the North.
Option		A more specific approach to delivering an intervention (for example a three-lane offline bypass to the west of a city). Given our current level of development, we should talk in terms of 'concepts' and not 'options'.
Package		A group of interventions that are linked by geography or technology.
Pan-Northern		Refers to transport schemes which fit within TfN's remit
Passenger Car Unit	PCU	Metric for traffic impact expressed in single passenger cars for modelling/engineering purposes
Phasing		To do with a method of delivery for a package or intervention which sees its delivery staggered to release benefits / cause disruption over a certain timeframe.
Prime Capabilities		The four areas where the North is highly skilled and globally competitive, as identified by the NPIER: advanced manufacturing; health innovation; energy; and digital.
Programme		A large set of projects/packages/interventions, which for the purposes of our work are specific to an SDC.
Project		A **project** could be an intervention on its own or a package, but in any case would generally be defined in its scope by a decision to procure it from the market – as such, we will not be at a level of development where this is a useful term, and it is proposed not to refer to 'projects' in the SPOCs.

Term	Acronym	Definition
Rail North Partnership		Acts on behalf of TfN and DfT to manage Northern and Trans-Pennine rail franchises
Reference Case		The 'do-minimum' scenario developed by TfN including the likely future interventions that aim to increase connectivity across the region
Sequencing		The process of establishing when packages/interventions should be progressed, and should generally follow the convention of 2020 – 2025, 2025 – 2035, 2035 – 2050.
Strategic Development Corridor	SDC	An area where evidence suggests investment in transport infrastructure will enable transformational economic growth.
Strategic Programme Outline Case	SPOC	Catch-all term to integrate the similar considerations that were to be taken forward as part of the SOP and SOC.
Strategic Road Studies		Northern Trans Pennine Routes; Manchester North-West Quadrant; Trans Pennine Tunnel
Sub-national Transport Body		A formal, legal entity designed to bridge the gap between national and local projects to plan and prioritise long term infrastructure investment in a specific region.
Transport Appraisal Guidance	WebTAG	An online tool which provides information on the role of transport modelling and appraisal, and how the transport appraisal process supports the development of investment decisions and business cases.
Transport for the North	TfN	The sub-national transport body for the North

Term	Acronym
Association for the Advancement of Cost Engineering International	AACEI
Air Quality Management Areas	AQMAs
Appraisal Specification Report	ASR
Appraisal Summary Table	AST
Areas of Outstanding Natural Beauty	AONB
Benefit Cost Ratio	BCR
Distributional Impact	DI
Exogenous Demand Growth Estimation	EDGE
Environmental Appraisal Report	EAR
Environmental Impact Assessment	EIA
Environmental Statement	ES
External Forecast Model	EFM
Full Business Case	FBC
Governance for Railway Investment Projects	GRIP
Great Britain Freight Model	GBFM
Gross Domestic Product	GDP
High Speed 2	HS2

Term	Acronym	Definition
HM Treasury		HMT
Independent Economic Review		IER
Integrated Sustainability Appraisal		ISA
Local Enterprise Partnership		LEP
Major Road Network		MRN
Million passengers per annum		mppa
National Character Area		NCA
National Nature Reserve		NNR
National Trip End Model		NTEM
Net Present Value		NPV
North of England Rail Model System		NoRMS
Northern Powerhouse Rail		NPR
Northern Transport Demand Model		NTDM
Official Journal of European Union		OJEU
Option Assessment Report		OAR
Outline Business Case		OBC
Passenger Car Unit		PCU
Post Opening Project Evaluation		POPE
Present Value		PV
Present Value of Benefits		PVB
Present Value of Costs		PVC
Project Control Framework		PCF
Public Transport		PT
Regional Transport Model		RTM
Sites of Special Scientific Interest		SSSI
Senior Modelling Group		SMG
Small to Medium Enterprise		SME
Special Areas of Conservation		SAC
Special Protection Area		SPA
Stage Gate Assessment Review		SGAR
Stakeholder Engagement Plan		SEP
Strategic Outline Business Case		SOBC / SOC
Strategic Outline Programme		SOP
Strategic Road Network		SRN
Strategic Transport Plan		STP
Trans-Pennine South		TPS
Technical Assurance Group		TAG
Transport Economic Efficiency		TEE

Term	Acronym	Definition
Value for Money		VfM
Value of Time		VoT
Wider Economic Benefits		WEBs