



GATEWAYS TO THE NORTHERN POWERHOUSE

A NORTHERN PORTS STRATEGY

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SUMMARY

60-SECOND SUMMARY

The north of England's major ports represent a massive growth opportunity for the northern economy. Sitting at the heart of some of the most dynamic national growth clusters, they are vital assets for the future of industry in the North, including areas such as renewable energy, automotive technologies and process industries. While northern ports already punch above their weight in respect of the proportion of freight traffic they handle, recent port investment puts them at the forefront of a revolution in global trade and logistics that could transform the north of England into an east–west supercorridor connecting Atlantic shipping with continental Europe.

Yet all this potential stands or falls on the ability to coordinate private and public investment and to take strategic policy decisions that will address current blockages and unlock the skills and talent that can restore northern ports to their role as the foundation of the region's success throughout its history.

Northern ports are faced with some significant challenges and to date they have not featured prominently in conceptions of a northern powerhouse. The decline of the North's foundation industries and coal-fired power have resulted in significant decreases in bulk movements, while the growth in the size of container ships has placed great strain on existing port infrastructure and eroded their competitiveness. This has been exacerbated by the lack of investment in east–west freight and logistics capacity, with around half of all containers arriving in southern ports ending up north of Birmingham, and the lack of coherent energy policy or industrial strategy on the part of successive governments.

In order to mitigate the challenges and maximise the opportunities that ports can offer to the northern economy, local partners must collaborate more effectively to **nurture clusters of economic development around their ports**; urgent investment must be made in trans-Pennine road and rail links to **open up the east–west freight supercorridor**; government must adopt **a consistent and long-term energy policy** and promote **a move from road to rail and coastal freight traffic**; and the northern ports, freight and logistics sector must learn to **speak with a clear and coherent voice**.

KEY FINDINGS

As an island nation, the UK's economic success has always been founded on maritime trade. The overwhelming majority of goods imported and exported from the UK – about 95 per cent of freight by volume every year – comes and goes through its ports. Ports are also significant investors and employers in their own right, with the UK ports sector contributing £7.7 billion in direct gross value added (GVA) to GDP each year.

Northern ports are ‘punching above their weight’. While the region is home to around 24 per cent of the total population, and contributes about 20 per cent of total GVA, it transports 56 per cent of the UK’s rail tonnage, 35 per cent of its road tonnage, and accommodates 35 per cent of total port throughput.

As the global gateways of the North, northern ports are a primary asset in realising the potential of the northern economy, and are an integral part of the region’s logistics chain. **Northern powerhouse strategies that prioritise connectivity should recognise that the ports are important nodes that facilitate global connectivity.**

Ports, and the wider freight and logistics sectors, are faced by a number of significant changes in both the supply and demand of goods and services, including:

- an unprecedented rise in the volume and frequency of international freight movements which has placed great strain on port operations and increased pressure on the North’s logistics chain
- the decline of the North’s foundation industries and coal-fired power resulting in significant decreases in bulk movements.

However, ports also face some important opportunities, including, for example:

- established and developing industrial clusters focused around port infrastructure such as the automotive industry around Port of Tyne or process industries around Teesport
- the vital contribution all ports are playing in respect of supplying future energy needs; for example, importing biomass and developing renewable energy around the Hull and Humber ports
- port-centric logistics across the Mersey ports through the development of the Liverpool2 container terminal and multi-modal facilities along the Manchester ship canal.

One of the most significant opportunities and challenges concerns the role of ports within the wider freight and logistics chain. As logistics processes become ever more automated and sophisticated **there is a massive opportunity for the north of England to be at the cutting edge of new patterns of freight distribution through a series of multimodal distribution parks and strategic rail freight interchanges and an east–west freight supercorridor linking Atlantic traffic with the European mainland.**

However, these opportunities are severely constrained by poor road and rail infrastructure, the suboptimal decisions made by freight distribution and shipping companies, and weak incentives to support modal shift from road to rail or to coastal ‘feeder’.

The four major port operators in the north of England have invested over £1 billion in the past five years in developing port infrastructure to seize local economic opportunities and changes in global logistics, but this has not been matched by public investment to support freight movements beyond the port boundaries. Indeed, public investment in transport infrastructure has typically privileged passenger travel without

recognising the potential for capacity improvements for both forms of transportation by taking freight off the roads.

The ports, freight and logistics sector also faces significant challenges in relation to its workforce which that driven by demographic ageing, technological developments and poor perceptions of employment in the sector. There is a pressing need for a new assessment of current and future skills requirements and a pan-northern approach to recruitment and retention within the sector.

The challenges and opportunities facing northern ports are great, but to date the sector has been fragmented and competitive. There is a growing appreciation that in order to maximise the opportunities presented through the northern powerhouse narrative and the formation of Transport for the North, **there would be considerable value in the major port operators in the North collaborating to promote the opportunities of using their ports for international connectivity and industrial development.**

RECOMMENDATIONS

The findings highlighted above have led us to identify fifteen separate recommendations for central government, for local government and local enterprise partnerships, and for northern ports, freight and logistics companies themselves. Our primary recommendations include the following.

- For northern port operators, together with local businesses, local authorities and local enterprise partnership (LEP) partners, to develop **local port growth strategies** focusing on opportunities in established, developing and emerging industry clusters, energy and logistics; and a requirement for each major port, working in conjunction with its local planning authorities, to develop an **adopted port master plan**.
- For Transport for the North to work with the Department for Transport and Network Rail to prioritise the **creation of an east-west freight supercorridor** by accelerating gauge improvements on this axis as part of wider passenger capacity improvement.
- For Transport for the North and government to develop **new models of scheme appraisal that better take account of the value of freight movements to the wider economy**.
- For government to set out a **clear, consistent and long-term energy strategy** on which businesses – in the energy sector and their supply chains and ancillary industries – can plan long-term future investment.
- For government to **reform the Mode Shift Revenue Support and Waterborne Freight Grant** and provide **clear guidance in the National Planning Policy Framework (NPPF) and National Policy Statement for Ports** to support modal shift from road to rail and to coastal feeding and significantly reduce costly and inefficient north-south lorry movements.
- For northern ports, together with freight and logistics partners to establish a **Northern Ports, Freight and Logistics Association** to drive strategic cooperation within the sector and to create a **Northern Maritime Knowledge Hub**.

1. INTRODUCTION

The north of England's ports have existed for hundreds of years and have been the foundation for the region's success throughout its history. A port has been sited on the Tyne since Roman times, and its proximity to the coal mines of the North East saw it play a lead role in fuelling Britain's burgeoning industrialisation (Port of Tyne 2016). On the Humber, the Port of Hull drove the export of lead and cloth, and imported key materials from abroad as the North's rise to industrial pre-eminence sent goods across the world (Gillet and MacMahon 1980). Throughout, the North's ports kept pace with economic developments, innovating at each turn. In Liverpool, for example, the Thomas Steer's dock was the world's first enclosed commercial wet dock, part of a wider port system that helped the region become one of the richest on earth (Merseyside Maritime Museum 2016). Furthermore, their contribution has always gone beyond the economic, with Teesport being integral to the development of the UK's defence capabilities, providing a base for the expanding submarine fleet during the First World War (BBC 2014).

Today, as Britain's role in the world has changed and its economic power has receded, the North's ports, and the wider freight and logistics sectors of which they are a central part, remain crucial to the success of the regional and national economy. As such, the North's ports are 'punching above their weight'. While the region is home to around 24 per cent of the total population, and contributes about 20 per cent of total GVA, it transports 56 per cent of the UK's rail tonnage, 35 per cent of its road tonnage, and accommodates 35 per cent of total port throughput (TfN 2016 forthcoming). However, the ports have experienced years of decline and are set for an uncertain future as they are buffeted by the continuation and acceleration of a number of changes in the volume, type and speed in which goods and services are imported and exported. In turn, these changes have placed unsustainable pressure on the region's and ports' supporting infrastructure, and are requiring ports to seek new skills and replace an ageing workforce.

Meanwhile, over the last few years, the northern powerhouse agenda has provided a focal point for efforts to rebalance the UK economy through investment in the northern economy and its capabilities. As key enablers of the North's economic activity, the idea of a northern powerhouse provides the ports, and the wider freight and logistics sectors, with an unprecedented opportunity to provide the basis of this rebalancing, and benefit from the growth it could deliver.

This report builds the case for greater cooperation among the North's major ports and the freight and logistics sectors as part of a wider strategy to realise their potential in driving growth in the North. In doing so, we set out a number of policy recommendations for both the public and private sectors. Chapter 2 details the context in which the North's ports

and the freight and logistics sectors sit; chapter 3 investigates the trends and challenges in supply and demand and what responses are required; chapter 4 highlights the need for infrastructure investment in the North and provides a number of policies to drive a more efficient modal shift; chapter 5 explores the skills and labour market challenges being driven by technological and demographic change; and chapter 6 concludes by explaining the need for strategic cooperation between ports.

2. THE NORTH AND ITS PORTS

2.1 THE NORTHERN STORY

The North has considerable economic strengths and assets

The north of England¹ is an integral part of the UK economy. In 2014, the three regions of the North – the North East, North West, and Yorkshire and the Humber – contributed £304 billion of gross value added (GVA), a total equivalent to 19.1 per cent of the UK economy (ONS 2015a). As such, the northern economy is bigger than all of the devolved nations' economies combined, being more than twice the size of Scotland's economy, and, if it were a sovereign nation, would rank as the 10th largest economy in the European Union (Eurostat 2015). Over the 10-year period between 2003 and 2013, growth of the five biggest cities in the region, covering the local enterprise partnership (LEP) areas of Leeds, Liverpool, Manchester, Newcastle and Sheffield, was higher than the UK average outside London, at 38.8 per cent versus 38.3 per cent respectively (Cox and Raikes 2015a).

This is because the North has a range of economic assets at its disposal – those among them that are most relevant to this report are set out below.

- **High value industries:** the top three industries by GVA contribution are manufacturing (at 15.2 per cent of GVA), wholesale and retail trade (11.5 per cent) and real estate (10.4 per cent), of which the former two provide a contribution above the national average (ONS 2015a).
- **Strong international connectivity:** the North records a positive balance of trade, with £55.2 billion of exports and £54.2 billion of imports in 2014 (Cox and Raikes 2015a). This is a result of the North East being the only net exporting region in England (HMRC 2015). Nearly all of these imports and exports move through the North's ports. The North also has a large tourism industry which attracts 4.4 million visitors per year, many of them through ferry services provided by the ports, and contributes £10.6 billion in direct GVA each year (Visit Britain 2015; ONS 2016a).
- **High value foreign investment:** foreign-owned business sites, though accounting for only 4.5 per cent of the total, generate 25.2 per cent of the region's GVA, or £48 billion (ONS 2015c).
- **A large higher education sector:** with 29 universities, seven of which are members of the Russell Group, and eight of which are in the top 250 world universities (Times Higher Education 2016). Together, they educate 521,000 students, 17.1 per cent of whom come from abroad, and produce 78,000 new graduates each year (HESA 2015).

¹ When referring to the 'north of England' or 'the North', this paper is referring to an area defined by the three European parliament constituencies south of Scotland and north of the Midlands – namely the North West, the North East, and Yorkshire and the Humber.

The North is underperforming relative to international peers

However, despite its absolute and relative success, a significant productivity gap exists between the North and the rest of the UK. Since the 2008/09 recession, growth of GVA per capita in the North has been falling behind that of the rest of the UK, and is now 25 per cent lower than the national average and 15 per cent lower when excluding London (GMCA 2016). Average labour productivity in the North is £26.88 of GVA per hour, compared to a national average of £30.05 of GVA per hour (Cox and Raikes 2015a). Employment rates are also below the national average, with the working-age employment rate standing at 71.3 per cent, compared to 73.5 per cent nationally (ONS 2015b).

These domestic imbalances are greater than in most developed nations, with the regional disparity in GDP per inhabitant between London and the regions being the largest in Europe (Cox and Raikes 2015a). Indeed, the gap in labour productivity between the UK's two largest city economies, London and Manchester, is larger than in any other G7 country and is more than double the gap between the two largest city economies in both Germany and Japan (OECD 2013). As a result, the North is underperforming relative to comparable economic regions around the world, with growth over the last 10 years lower than all but one of the 28 EU countries (Cox and Raikes 2015a).

This is partly a result of low transport investment hindering intra-regional connectivity, and a weak skills base relative to London and other regions. In terms of transport, the North has experienced sustained underinvestment in capital projects, with expenditure per head being £166 in 2013/14 – half that for London (£332) and less than the UK average (£189) (HMT 2014). If the North had received the same per-capita transport spend as London it would have an additional £33 billion to spend on infrastructure projects over the next five years, and this disparity is set to grow (HMT 2015a). Meanwhile, northern regions are lower skilled than London and some other parts of the UK (ONS 2015d), with the number of working-age people qualified to NVQ level 3 being 4.1 per cent below the national average, at 52.4 per cent (ONS 2015b). This is of particular concern given that the UK Commission for Employment and Skills (UKCES) has concluded that 57.9 per cent of new jobs in the North up to 2022 will require a level 3 qualification or above (UKCES 2014).

There is now increased recognition that the North's growth potential is much greater than previously understood or appreciated, and that targeted investment to overcome regional shortcomings could realise this potential. For example, if economic output per head had grown at the national average, the northern economy would be nearly 2 per cent, or £5 billion, larger. A halving of the gap between the overall level of output per head relative to the national level would provide an economic boost of £34 billion, or 11.9 per cent, on current levels (Cox and Raikes 2015a). This potential can be realised if the region receives higher levels of investment – for example, Transport for the North, the body set up to plan and oversee transport infrastructure investment, found that a proportional level of public investment in the freight and logistics sector, coupled with private sector investment, could deliver £34.7 billion in

GVA benefits² to the UK economy and £13–£20 billion of GVA benefits³ to the northern economy, as well as 25,000–38,000 additional jobs by 2033 (TfN 2016 forthcoming).

The political focus on the North presents an opportunity to realise its potential

Over the past two years, the chancellor has led the development of the ‘northern powerhouse’ as a means to highlight the problems and potential of the northern economy, and provide a focal point for policies that lower the barriers to economic success in the North. According to the government, the northern powerhouse is part of a wider agenda to rebalance the national economy and increase UK productivity (HMT 2015b).

In essence, the northern powerhouse is founded on an economic theory that posits that the agglomeration of key economic hubs, such as science and technology, around the North’s largest cities will provide a counterweight to London and rebalance the national economy (Cox and Raikes 2015a). As such, agglomeration will be achieved through improving inter-city and intra-regional connectivity and the devolution of key powers and budgets to city-regions.

Sitting at the heart of the northern powerhouse is the Transport for the North (TfN) organisation, asked with establishing a long-term transport strategy for the North. TfN is developing a portfolio of strategic multimodal transport investment opportunities to support regional economic growth by improving connectivity and resilience, lowering journey times, relieving capacity constraints and simplifying the user experience (DfT 2016a). Ultimately, TfN is seeking to create an integrated transport system that both anticipates and shapes future patterns of land use and economic growth. In identifying those patterns, TfN commissioned the Northern Powerhouse Independent Economic Review, which identified four ‘prime capabilities’ – those that most drive growth and productivity within the northern economy – and three ‘enabling capabilities’ that facilitate this growth.

Central to maximising the benefits of these capabilities are the North’s ports, all of which play a central role in at least three of the prime capabilities – advanced manufacturing, energy, and health innovation – and are an integral constituent of the logistics chain, one of the enabling capabilities. Indeed, northern ports are the global gateways through which much of the UK’s trade enters and leaves and, as such, facilitate large amounts of regional and national economic activity, as set out in the next section.

2 User and non-user benefits to the entire UK economy, based on a 60-year appraisal period, discounted to 2010 and expressed in 2010 prices (TfN 2016 forthcoming).

3 Gross value added (GVA) benefits are net additional to the North only, based on a 30-year appraisal period, discounted at 3.5 per cent to 2016 values (ibid).

2.2 THE PORTS STORY

Ports are fundamental to the performance of the entire UK economy

As an island nation the UK's economic success has always been founded on maritime trade. While history has seen individual ports flourish and decline, their central role in facilitating commerce, migration and exploration has remained constant. Today, the UK relies on its ports and their supporting road and rail freight infrastructure to connect its producers and consumers to the global economy. The overwhelming majority of goods imported and exported from the UK – about 95 per cent of freight by volume every year – comes and goes through its ports (DfT 2015a). Ports are also significant investors and employers in their own right, with the UK ports sector contributing £7.7 billion in direct gross value added to GDP each year (Oxford Economics 2015a). Ports source much of the inputs for goods and services they produce from UK businesses, which in turn have their own supply chains and employees.

Across the UK, the port sector directly employs over 118,000 full-time equivalents (FTEs). Many of these are high-value, productive jobs – the sector's labour productivity is £65,400 per worker, 1.3 times the UK economy's average.⁴ With indirect and induced employment considered, the sector supported a total of 344,300 jobs in 2013, equivalent to one in every 94 jobs in the UK (ibid). Employees of the port sector and its suppliers spend their wages and salaries on goods and services in the wider domestic economy, further stimulating economic activity and employment. When these indirect and induced effects are considered, the overall contribution of the ports sector rises to £19 billion, equivalent to 1.2 per cent of UK GDP (ibid).

The UK government's stance on UK port policy is light-touch, guided by the view that operational and investment decisions should be made on the basis of commercial factors by an industry operating within a free market environment (DfT 2012). As such, most UK ports and their operations are left to market forces, with the majority of the major ports being under private ownership, which contrasts with the prevalence of public and mixed ownership models in the major continental European ports. This is a material consideration, as UK ports not only compete with each other at the domestic level, but also compete with European and other ports at the regional and international level.

The northern ports play a locally, regionally and nationally significant role

The north of England is home to nine of the UK's major ports, operated by four major operators, as shown in figure 2.1:

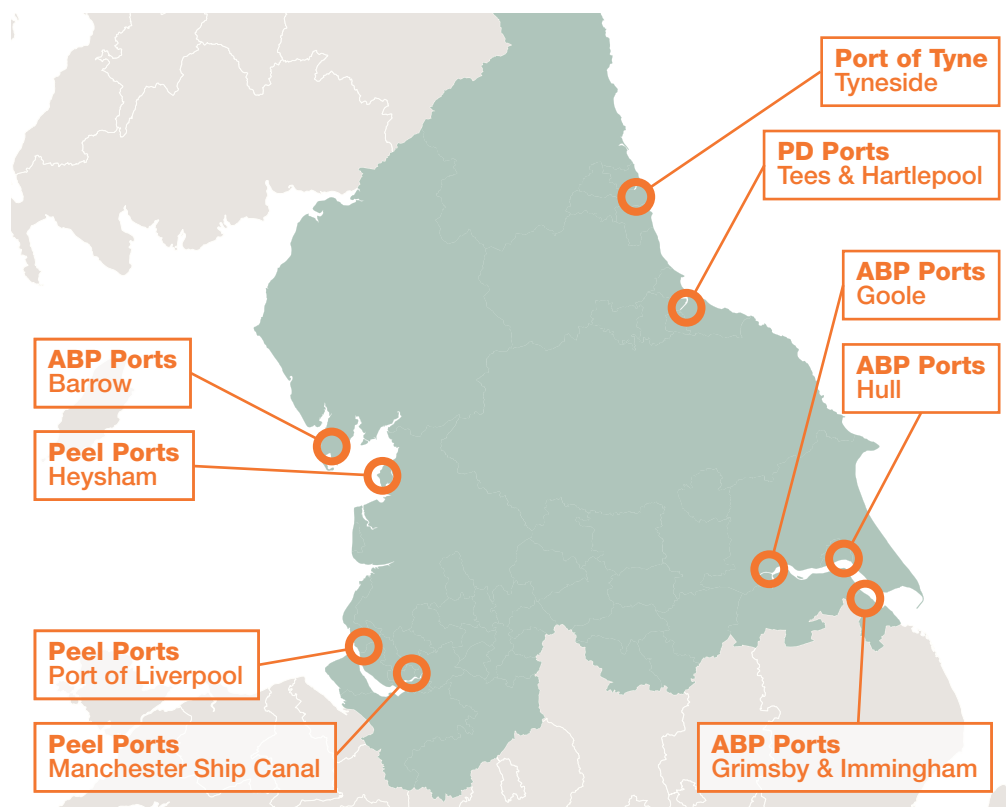
- Grimsby and Immingham, Hull, Goole, and Barrow (Associated British Ports)
- Liverpool, Manchester ship canal, and Heysham (Peel Ports)
- Teesport and Hartlepool (PD Ports)
- Port of Tyne (Port of Tyne).

⁴ Labour productivity as measured by GVA divided by employment. Figures are for 2013.

Consistent with the national story, the major ports of the North have a long history in the region. Maritime activities on the Mersey estuary, the river Tyne, the river Tees, and the Humber estuary date back to medieval times or before, and have acted as centres of regional commerce throughout the centuries.

FIGURE 2.1

The major ports in the north of England⁵



Today, the North is ‘punching above its weight’ when it comes to freight, providing **34 per cent of the UK’s large warehouse capacity and carrying 56 per cent of total rail freight tonnage**, while the region is home to around 24 per cent of the total population, and contributes about 20 per cent of total GVA. Northern ports are integral to this success (TfN 2016 forthcoming). Taken together, ports in the North handled **173.9 million tonnes of freight** (import and export) in 2014, which amounted to **34.5 per cent of all UK port traffic** (DfT 2015a). This is partly down to their advantageous geographic position, which provides access to the Atlantic and continental European markets as well as a large domestic hinterland.

Each of the major northern ports operate across a number of core business areas, including supporting a multitude of industries (from agriculture, through energy, to high street commerce), providing ferry and cruise terminals, importing and exporting cars, bulk, conventional

⁵ The North is also home to 13 minor ports, though it is the major ports that will be the focus of this study (DfT 2015a).

and containerised cargo, and providing estate services. As such, they play a significant role in the national economy.

- **The Mersey Ports and the Port of Heysham** handled 7.8 per cent of national port freight traffic in 2014, or 42.5 million tonnes of cargo, with 45 per cent of UK container trade with North America coming through Liverpool (ibid). The Liverpool2 container survey upgrade will double the Port of Liverpool's capacity to 1.5 million TEUs,⁶ and allow it to accommodate 95 per cent of the world's shipping fleet (Peel Ports 2016a).
- **The Port of Tyne** plays an important role in ensuring the North East is the only net exporting region in the UK by value, particularly through its car terminal services, which make it the second-largest car port in the UK. It was also the UK's largest importer of biomass in 2014, and has the third largest container terminal in the North. In all, Tyne contributed £710 million to North East GVA and directly or supported 14,491 FTE jobs in the wider community (Port of Tyne 2016). The Port's most recent investment was in a £25 million extension of its industrial quay in 2015/16.
- **The ABP Humber ports**, including Grimsby and Immingham, which is the largest port in the UK, handled 14.5 per cent of national major port tonnage, at 71.6 million tonnes, in 2014 (DfT 2015a). In all, the Humber ports handle the equivalent of more than 1 million TEUs of freight through the use of more than 60 container and roll-on/roll-off (ro-ro) shipping calls per week, connecting the North to Europe, Scandinavia and beyond. The Humber ports' estates, and the customers it houses, directly employ 9,610 FTEs, and 22,973 indirectly (Arup 2014). Additionally, the Green Port Hull initiative is seeking to exploit Hull's offshore wind potential to become a world-class centre for renewables (Siemens 2015).
- **Teesport** is the second largest container port in the North of the UK, with over 650,000 TEU capacity, and a key gateway to the European continental markets (PD Ports 2016b). The Port is the UK's best-connected feeder port with over 25 vessel calls per week to more than 13 strategic markets and connections to most of the world's largest shipping lanes. In 2014, it processed 40 million tonnes of freight (DfT 2015a). Teesport is a key driver of the North East economy, supporting over 5,000 direct and indirect jobs, and Tees Valley LEP identifies Teesport as a key subregional asset (Tees Valley Unlimited 2015).

Ports' potential role in delivering the 'northern powerhouse' agenda

The North's ports are key to its economic success. However, ports are yet to feature prominently in northern powerhouse strategies – partly because this work is at the nascent stage, but also because northern ports have not had a coherent, unified voice, which has inhibited their ability to influence government policy.

⁶ A 20-foot equivalent unit, or TEU, is the inexact unit of cargo capacity used for container ships, terminals and other freight vehicles. It is based on the volume of a standard-sized intermodal container, which is 20 feet in length.

In seeking to create a dynamic regional economy, the northern powerhouse must not lose sight of the North's reliance on global markets, and its significant role in contributing to the UK's balance of trade. Global connectivity, along with national and regional connectivity, must remain a key priority. As the global gateways of the North, northern ports are an integral part of the region's logistics chain and a primary asset in realising the potential of the northern economy. Furthermore, ports operate in a challenging and competitive global environment that places considerable pressure on their ability to continue operating effectively as facilitators and drivers of economic activity in the North. The most pressing trends and challenges to growth are found in three main areas:

- changes in supply and demand of goods and services
- the capacity of port and regional infrastructure to support these changes
- the labour market and skills requirements that result.

Indeed, a number of developments in these areas have contributed to the relative decline of northern ports in recent decades. We now inspect each of these areas in turn.

3.

TRENDS AND CHALLENGES IN SUPPLY AND DEMAND

Ports, and the wider freight and logistics sectors, are faced by a number of significant changes in both the supply and demand of goods and services. Ports are particularly sensitive to changes in the volume of goods and how these goods are being moved, and, in turn, the fate of a given port is often tied to the success of those industrial clusters upon which it depends. In recent years, technological change and rising wealth have stimulated an unprecedented rise in the volume and frequency of international freight movements. These trends have placed great strain on port operations and increased pressure on the North's logistics chain. Meanwhile, the North's foundation industries have declined as competition from emerging markets has increased. New economic opportunities have also emerged, particularly in the energy industry, which present ports with opportunities to compensate for the negative impacts of global and national trends, but progress has been hindered by the uncertainty surrounding the UK government's energy and industrial policies. This chapter will explore these trends and the resulting challenges, and show that, while facing an uncertain future, there is much the northern ports and freight and logistics sectors can do to anticipate and adapt to changing market conditions and ensure that they continue to prosper.

3.1 TRENDS IN FREIGHT AND LOGISTICS

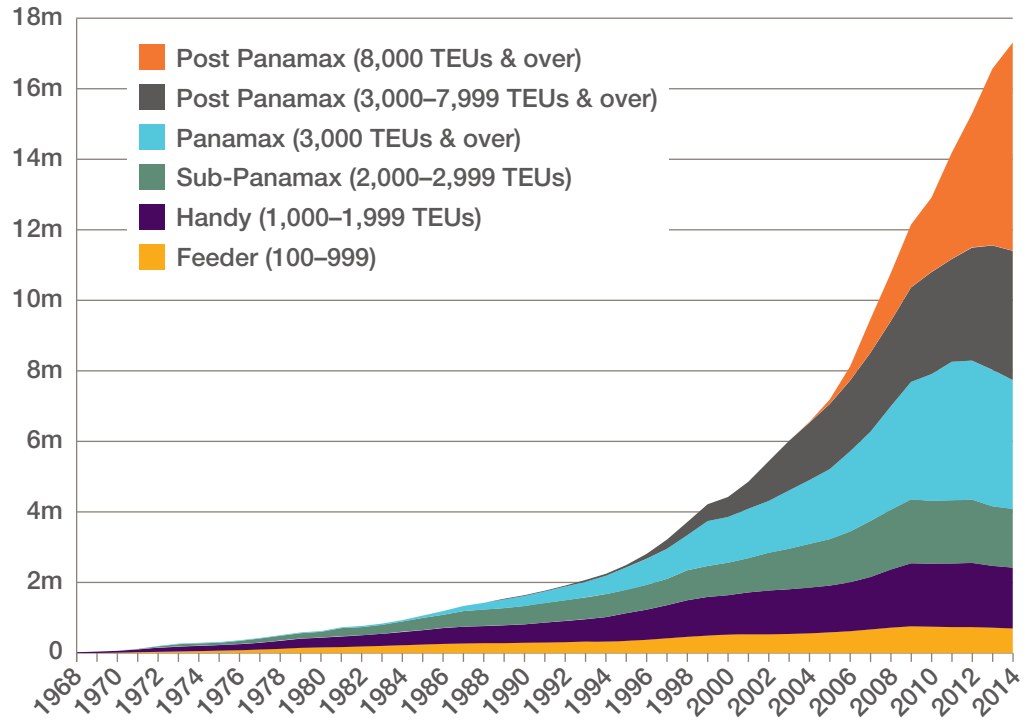
International freight trends – bigger ships, faster freight

The growth of goods produced in Asia and consumed in Europe and North America has necessitated an unprecedented boom in the volume of freight being shipped internationally over the past few decades. This has led to a concomitant increase in the size of container ships and, in turn, greater capacity expectations being placed on freight and logistics chains.

It has been over 25 years since the biggest container ships became too wide for the Panama Canal. The first 'post-Panamax' class ships had capacity of around 5,000 20-foot equivalent (TEU) containers; today's largest ships routinely carry over triple this. The Maersk E-Class has a capacity of around 14,000 TEUs, while the Maersk Triple-E Class has a capacity of more than 18,000 TEUs (Ship Technology 2016). Those post-Panamax ships of 8,000 TEUs and above now increasingly dominate a shipping industry that has experienced exponential growth since the turn of the millennium, as illustrated in figure 3.1.

FIGURE 3.1

Container ship size has grown steadily since the 1960s
Growth in container ship size (in TEUs), 1968–2014



Source: Tran and Hassis 2014

The rapid growth in shipping volumes has directly affected the UK’s port industry and the freight and logistics chains that support them. Though differing across the sectors they serve, a key challenge for ports is to invest ahead of increases in shipping volumes to ensure their facilities can expand and accommodate accordingly. As ports compete at a regional, national and international level they cannot afford to be left behind. The capital costs are considerable, with the ever increasing size of new ships requiring investments in infrastructure to accommodate them, including longer and deeper berths, deeper river shipping channels, and larger, more advanced cranes. For example, the soon to be operational Liverpool2 container terminal expansion at the Port of Liverpool – which will provide capacity to handle two 380-metre post-Panamax vessels simultaneously – has required £300 million in investment (Peel Ports 2016a).

The growth of the international freight and shipping industry, and the growth in the scale of ships, has placed greater time pressures on ports, as customers expect ever more rapid delivery. Shipping companies want larger vessels unloaded and loaded in shorter spaces of time, which has cascading effects on the ports themselves and on the logistics chains they link into. This has increased the competitive forces between ports as shipping companies demand faster services. More landside space is required to store containers, and while ships face few physical barriers to expansion and can pursue economies of scale by growing capacity, ports are subject to land and capital limitations. As such, they must

instead seek efficiencies: moving, storing and processing more bulk and container goods using less space, time and energy. The capital requirements for rapid load and unload of increasingly large ships are also considerable; for instance, PD Ports has invested £35 million in major quayside redevelopments at Teesport to enhance its ability to handle large ships with quick turnaround (PD Ports 2016).

Alongside the demands placed on internal port infrastructure, changes in the volume and speed of freight movements impact the road and rail connections between ports and the surrounding hinterland, which are placed under pressure by increases in the volume and turnover of traffic. In particular, the North has acute capacity problems in both the trans-Pennine road and rail corridors and at key modal connections. The resulting delays at these connections and along key routes are imposing large costs which risk placing the ports at a competitive disadvantage if they are not resolved. The impacts upon the North's multimodal transport network and internal port infrastructure are explored in chapter 4.

The future of freight and manufacturing

While higher volumes and the more rapid turnaround of goods are increasing pressure on ports, there is growing evidence of a converse trend, away from the consumption of materials in the UK, which will further disrupt ports and the freight and logistics sectors. This is the notion of so-called 'peak stuff' – that the amount of 'stuff' used in the UK, including food, fuel, metals and building materials, has fallen dramatically in the last decade or so. This trend has been corroborated by the Office for National Statistics (ONS), which has recorded a fall in the amount of material consumed in the UK from a peak of 889.9 million tonnes in 2001 (15.1 tonnes per person) to 659.1 million tonnes (10.3 tonnes per person) in 2013 (ONS 2016b).

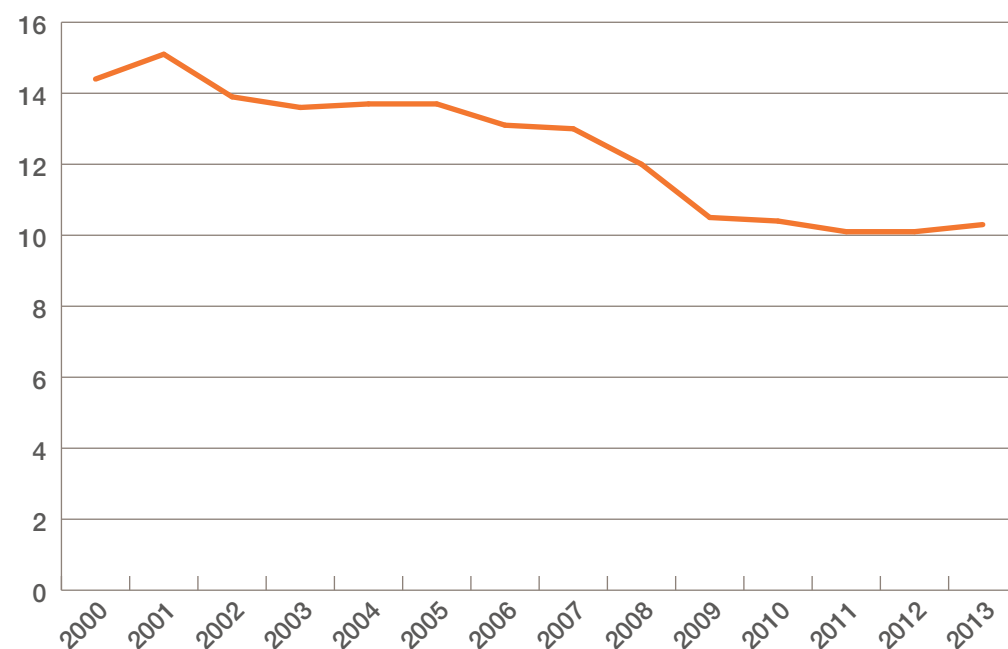
A number of factors are driving this trend, including increased manufacturing efficiency and changes in patterns of consumption. In particular, digitisation has seen households shift away from many resource-intensive goods in favour of digital equivalents, replacing CDs, books and music players with online digital consumption (ONS 2016b). Furthermore, some of the largest decreases have been in metal ore consumption, as the amount of metal used in manufacturing modern domestic goods is now lower than in the past. Taken together, the move away from raw materials and the increased demand for digital products have led to a stabilisation and decline in bulk volumes and a growth in lift-on/lift-off (lo-lo) and roll-on/roll-off (ro-ro) freight, though liquid and dry bulk remain the largest cargo categories by volume. Liquid bulk has steadily declined since 2001 due to decreases in crude oil imports and exports, and dry bulk has remained relatively steady (DfT 2015a).

The future of manufacturing is also expected to experience profound change in the coming decades. Manufacturing is traditionally understood as the production process in which raw materials are transformed into physical products through the input of people's labour and other resources. However, there is a growing understanding that physical production is at the centre of a much wider manufacturing value chain

(Foresight 2013). It is in the wider value chain, where manufacturers can provide services related to their products, that much of the growth in manufacturing is occurring. Examples include: ‘remanufacturers’ returning end-of-life products to original specifications or better; ‘collaborative consumption’, where no one customer owns a product outright; and the growth of ‘factory-less good producers’, which capture value by selling technological knowledge and leaving production to others (ibid). Indeed, the rise of ‘distributed manufacturing’, of which headline-grabbing 3D printing is a subset, could have profound effects on the way ports operate, whether by driving significant declines in shipping volumes, as products are produced closer to the point of consumption, or by demanding a more responsive logistics chain.

FIGURE 3.2

Since 2001, raw material consumption has been falling in the UK
Raw material consumption (tonnes per person) in the UK, 2000–2013



Source: ONS, ‘Material consumption in the United Kingdom, 2000 to 2013’ (ONS 2016b)
 Note: Raw materials include biomass, metal ores, non-metallic minerals and fossil energy materials.

The consequences of these trends for the freight industry are, by their very nature, uncertain, but are likely to be significant. Indeed, long-term changes to the UK’s manufacturing base have been impacting northern ports for decades, with their performance having always been linked to the fate of the core commodities and industries that drive the region’s economy.

Decline in foundation industries

The long-term decline of the UK coal industry has had a significant impact on the northern ports. The collapse of domestic coal production, coupled with falling demand for coal imports, has meant that the volume of coal passing through northern ports has declined. Provisional figures for 2015 show that domestic coal production was down 27 per cent on 2014 at 8.5 million tonnes (DECC 2016). Imports – which dominate ports

operations, as very little domestic coal is exported – were also down, by 39 per cent on 2014 at 25.5 million tonnes, the lowest value for 15 years. This has already had a sizeable impact on major ports in the North East in particular, which is where most of the UK coal imports are handled. Most of these ports are suffering the effects of sharply declining coal volumes and announcing or considering redundancies. The Port of Tyne, for instance, recently announced that its coal volumes had declined from 2.7 million in 2014 to 1.4 million in 2015, and it does not expect to import any coal in 2016 (Whitfield 2016). These changes have partly been driven by environmental imperatives, as the following cases serve to illustrate.

Drax and Lynemouth power stations

The Drax power station, located in North Yorkshire, provides around 8 per cent of the UK's electricity (Drax Group 2015). It has historically relied on consistent coal supplies from both the domestic and international markets, the latter of which has been facilitated by the northern ports.

For the last 10 years Drax has been developing the capability to use biomass as a sustainable and lower-emissions alternative to coal. To date it has converted half of its operations – three generating units – to biomass. This has resulted in a decline in coal demand of 4 million tonnes (ibid). This has been a challenge for some ports, and though there is a rise in demand for biomass imports from the United States, this has only partially offset the impact. Currently, the ports of Immingham, Hull and Tyne service Drax's biomass needs, and each has made significant investment in facilities to enable this. In order to do so, Port of Tyne invested over £30 million in constructing and developing the first UK biomass storage and transport facility for Drax in 2010. ABP has built a dedicated £16 million biomass terminal at the Port of Hull, and a £130 million renewable fuels terminal at Immingham (ABP 2014). Looking to the future, Peel Ports has invested £100 million in its new biomass handling terminal, set to become fully operational by summer 2016 (Peel Ports 2015).

Alongside its support of Drax, the Port of Tyne has commenced construction of a second biomass storage and transportation facility, an investment similar to other projects of around £100 million, of which the Port will make a substantial contribution specifically to service a second customer, Lynemouth Power Limited, which anticipates the coal-to-biomass conversion of the Lynemouth power station in Northumberland (Port of Tyne 2016).

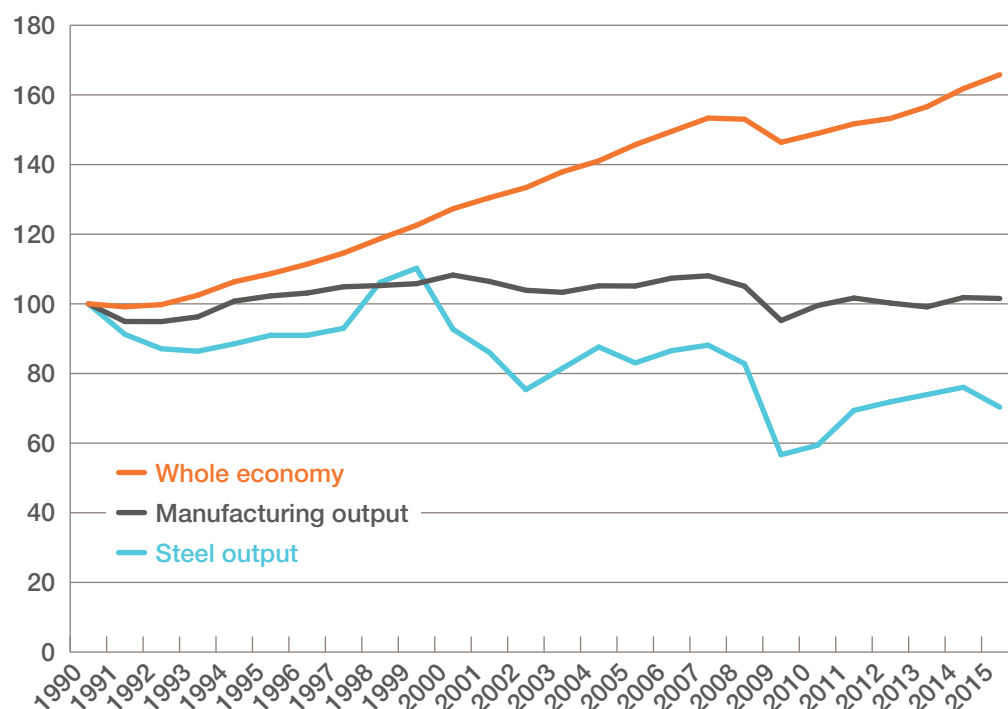
Similarly, the UK steel industry has experienced an extended period of decline, resulting from the combined effect of the 2008/2009 recession, increased competition from emerging markets, and the lack of government support relative to other developed nations (Lawrence and Stirling 2016). From 1990 to 2014 output declined by 24 per cent in real terms, with a sharp post-recession fall of 31 per cent between 2007 and 2008 (Rhodes 2015). This decline contrasts with the performance of the manufacturing sector as

a whole, which has not seen an overall decline in output between 1990 and 2014 – rather, it posted 2 per cent growth over this period (ibid).

FIGURE 3.3

The steel industry has consistently underperformed against the rest of the UK manufacturing sector and the wider economy

Output for the UK economy as a whole (real GDP), the manufacturing sector and the foundation industries (real GVA, 1990=100), 1990–2015



Source: ONS, 'Annual business survey – Data by country/continent of owner, 2009–2013' (ONS 2016c)

The effects of the industry’s decline in the north of England have been profound. In October 2015 Sahaviriya Steel Industries (SSI) mothballed their major steel plant in Redcar on Teesside in the North East, resulting in the loss of 1,700 jobs (BBC 2015). In April 2016, Tata Steel sold Scunthorpe, the company’s plant in North Lincolnshire near the Humber ports, to Greybull Capital in a deal seeking to turn the loss-making operation around. This followed losses of 900 jobs in late 2015 (BBC 2016).

The effect of the decline of UK steel on the major northern ports has been considerable. In October 2015 PD Ports announced that the significant reduction in port activity arising from the cessation of steelmaking at Redcar would result in around 80 job losses at Teesport (Blackburn 2015). Similarly, ABP has consulted with employees on potential redundancies at the ports of Grimsby and Immingham as a result of the decline in coal import volumes (Grimsby Telegraph 2016).

An uncertain future for northern ports

In sum, increases in the volume and turnaround of freight, changes in the type of goods demanded, and the rapid rise and fall of manufacturing processes and foundation industries all add up to an uncertain future for northern ports. Indeed, these changes are already having large, negative impacts on business models across the North's major, and minor, ports.

As an island, the UK will always require ports, and as long as seaborne freight remains the primary mode of importing and exporting, the northern ports will remain an essential regional and national asset. Throughout their history, the fate of the northern ports has always been inextricably linked to the performance of the industries that drive the region's economy. As these industries have declined, ports have always sought out the positive growth areas of the future and changed their business models and investment decisions accordingly. As such, the port industry is a highly reactive one, and ports anticipate and respond to changes in the economic landscape and the requirements of importers and exporters. Inevitably, this process leads to the decline of some existing port operations, and the trends described above could lead to greater centralisation of port capacities as international and regional shipping companies seek to minimise port calls and maximise efficiencies. In identifying and linking with the growth areas of the future, the northern ports sector will have to consider the continued viability of some of its ports, ensuring that they are able to reposition their operations to provide the specialisms demanded by the region's industrial growth clusters. Some consolidation, and even the closure, of minor ports is likely to be inevitable, particularly while government policy remains market led.

We now turn to how the North's ports are already taking advantage of new manufacturing and industry cluster opportunities, and provide recommendations on how they can identify and better exploit the new growth areas of the future.

3.2 THE GROWTH AREAS OF THE FUTURE

Transport for the North's northern powerhouse independent economic review (IER) has identified four 'prime capabilities' that represent the North's principal economic assets (DfT 2016a):

- **advanced manufacturing**, with a particular focus on materials and processes
- **energy**, in particular expertise around generation, storage and low-carbon technologies and processes, especially in nuclear and offshore wind
- **health innovation**, with a focus on life sciences, medical technologies and devices, and a growing competence in new service delivery models brought about by e-health and devolution within the health service
- **digital technology**, focusing in particular on computation, software tools/design and content, data analytics, simulation/modelling, and wider strengths in media.

The North's key growth clusters are areas in which these 'prime capability' industries have exploited the agglomeration opportunities afforded by a prevalence of high skills, reliable connectivity to national and international markets, and access to enough land and energy to meet requirements (ibid). This has led the IER to identify logistics as one of the three key 'enabling capabilities', alongside financial and professional services and further and higher education, that drive agglomeration. As such, ports are central to the creation and maintenance of growth clusters, providing the means by which industries can obtain connectivity to markets within and out of the region and the UK and attract domestic and foreign investment (ibid).

Northern ports are already well connected to industry clusters

Of the prime capabilities, the role of the northern ports in the energy sector is already well established. Conventional energy – including coal and increasingly biomass – continues to depend on imported bulk cargo to fuel its production. Furthermore, ports are already exploiting the rise of renewable energy in the region. The offshore wind industry, in particular, is inextricably linked to ports, as the construction, installation and maintenance of offshore wind farms requires dedicated portside infrastructure and expertise. Indeed, the co-location of energy sector manufacturers and service providers around ports creates a mass of expertise that increases their ability to capitalise on any further developments in biofuels, carbon capture and storage, waste-to-energy, solar, wave and tidal power generation. Of the other prime capabilities, advanced manufacturing, digital technology, and health innovation rely on access to reliable supply chains for their inputs and access to international markets for export. The facilities and logistical expertise and specialisms of ports are instrumental in establishing these links.

The following case studies highlight the proven track record northern ports have in exploiting these cluster opportunities.

Industrial clusters – case studies

Tyne: Nissan and the automotive industry

The Port of Tyne's car import and export operations have grown considerably in recent years, with a doubling of cars processed over the last five years, from 300,000 vehicles in 2008 to over 600,000 in 2013. Its customers include Nissan, VW Group, Komatsu, Höegh and Hitachi. Despite its small overall size, the Port of Tyne is the second-largest car exporter in the UK, and the 13th-largest car import, export, and transshipment car port in Europe. Its most significant manufacturing customer is Nissan, which has operated its car plant in Sunderland since 1985 and represents one-third of all UK car manufacturing. Nissan chose Sunderland due to its skilled labour force – which at the time had become readily available in the wake of the decline in the wider manufacturing base – and the plant's location next to the port, which provides container handling, storage, warehousing and security services for import of containerised car parts for manufacturing within its 'just-in-time' processes. This location also met the extensive land requirements for car terminals that export to world markets by sea. Around 80 per cent of

Nissan's vehicles manufactured at the plant are exported, with Tyne processing the majority of this volume through two of its four car terminals (Port of Tyne 2016). One terminal is used for the import of VW/Audi cars into the UK, utilising the car ships which then take the Nissan product for export – thus providing additional efficiencies. The fourth terminal is for transshipment of cars that do not enter the UK, but are held until the market is right. These utilise space on the car carrier ships, providing further efficiencies. The container terminal also handles export and import of containerised car parts for Nissan and its suppliers in the extensive automotive supply chain in the North East.

A key challenge for the automotive industry in the North East is remaining competitive with their international counterparts. Automotive manufacturers compete with their counterparts in other countries for the rights to manufacture cars. The Nissan plant in Sunderland was the first in Europe to achieve the necessary quality levels to produce Nissan's premium Infiniti products, and maintaining this advantage requires ongoing investment in its facilities and workforce (Port of Tyne 2015).

Teesport: North East of England Process Industry Cluster

Teesport and Hartlepool is the logistical hub for the North East of England Process Industry Cluster (NEPIC). NEPIC was formed in 2003 and represents the 1,400 companies involved in the supply chain of the process industry in the North East, which generates £12 billion in annual sales and indirectly employs 190,000 people. The cluster includes refining, petrochemicals, specialty and fine chemicals, plastics, biotechnology and pharmaceuticals, and has made a recent transition into renewable energy production. The Tees Valley contains the largest integrated chemical complex in the UK and the second-largest in Europe. It is home to 30 per cent of the UK's chemicals processing industries. The largest concentration of processing activity is at Wilton International, with other clusters at Billingham and Seal Sands on the north side of the river, where most of the region's petrochemical plants and storage facilities are located. The concentration of this cluster near Teesport is no accident; about 70 per cent of the cargo handled at Teesport is related to the process industry, either in raw materials or finished products (NEPIC 2016a).

The Tees Valley Unlimited *Economic Assessment 2015/16* notes that some of the key challenges facing NEPIC, along with the rest of the Tees Valley, include the susceptibility of some of these manufacturers to changes in global commodity prices; key bottlenecks on the road network; poor intra-Tees Valley rail connectivity; and lack of quality business accommodation, particularly innovation space (Tees Valley Unlimited 2015).

Humber: Green Port Hull

The Green Port Hull vision is a collaboration between Hull city council, East Riding of Yorkshire council, and Associated British Ports (ABP) to promote investment and development of the renewable energy sector in the Humber region centred around the Hull and Goole ports, both of which are operated by ABP.

Its centrepiece will be the construction of Siemens' offshore wind turbine blade manufacturing, assembly and servicing facilities. These facilities represent a combined investment by Siemens and ABP of £310 million and the project is expected to create up to 1,000 local jobs directly, with additional jobs during construction and indirectly through the supply chain. The vision seeks to take advantage of the Port of Hull's location in relation to the offshore wind industry in the North Sea, and capture the opportunities for regional economic growth, employment and development that come with it. It is also hoped that the project will benefit from synergies with other key sectors in the Humber, including chemicals, petrochemicals and advanced manufacturing (Siemens 2015).

The Humber strategic economic plan, much like the Tees Valley Unlimited economic assessment, highlights the vital importance of infrastructure corridors to support this emerging industry cluster. The 'energy estuary' will rely on resilient freight and passenger rail infrastructure connecting the Humber ports and airports to the national network, along with real estate for manufacturing and innovation, both of which the Humber LEP seeks to deliver through its strategic economic plan (Humber LEP 2014).

Liverpool: process industries

The Port of Liverpool plays an important role for the process industries. These include food manufacturing; the port's grain terminal is one of the largest in the UK. The port supports and facilitates the operations of a number of important process industry firms and manufacturers, including Heinz, which is based in Wigan and imports their beans through the port's container terminal; Cargill; DACSA, who operate one of the largest corn mills in the country; ADM; Kellogg's, which exports its cereals through the Manchester ship canal; Kingsland Wine, whose Salford bottling plant is positioned close to the Ship Canal from where it imports wine in containers from the Mediterranean; and New Britain Palm Oil. All provide value added activities as part of their wider supply chains.

Identifying growth clusters

While the ports have been effective facilitators and beneficiaries of economic activity within the region, we have found that a consistent concern of the port operators is how hard it is both to identify existing industry clusters and to anticipate the location and sectors in which new clusters will appear. Clusters need to be supported and developed by public bodies, including local authorities and LEPs, and those private firms within and out of the supply chain. In particular, ports and the wider freight and logistics sectors need to be able to identify, promote and support emergent clusters, and the absence of these capabilities will be likely to lead to a loss of growth opportunities within the North. This could increase the chance of suboptimal path dependence in the region's response to technological and manufacturing trends, as has arguably been the case with the steel industry. Efforts to ensure otherwise have

been confounded by the lack of support for key foundation industries and the absence of an explicit industrial policy for the North, and the country as a whole, from the UK government (Lawrence and Stirling 2016).

However, notable progress has been made by TfN and the region's LEPs in identifying strategic opportunities for growth, as the independent economic review shows. In the absence of any changes in the approach taken by central government, the northern ports and freight and logistics sectors have a unique opportunity to take advantage of the current political climate afforded by the northern powerhouse to improve their ability to identify and encourage growth clusters. Indeed, as both facilitators and beneficiaries, these sectors are well positioned to identify and support those emerging industries that are primed for future growth.

We recommend that the northern ports, along with the wider freight and logistics sector, work in conjunction with local authorities and local enterprise partnerships to create local port growth strategies.

Each strategy would focus on identifying and maximising the value of existing industry clusters while anticipating the opportunities in emergent clusters. It would do this by providing some, or all, of the following suite of functions.

- **Assess existing growth clusters** and the value that ports and freight and logistics can and do bring, by working with local authorities, LEPs and other key stakeholders and complementing the existing assessments.
- **Anticipate emergent growth opportunities**, based on an assessment of changes in regional, national and international markets, and the North's economic strengths as set out by the independent economic review.
- **Publicise and promote industry clusters**, helping the ports and freight and logistics sectors to highlight the commercial attractiveness of the region, making the case for investment and attracting further economic activity.
- **Understand the infrastructure requirements** that result from the growth of clusters and their supply chains (assessed in the section below and in the next chapter) on infrastructure.
- **Provide opportunities for information exchange**, whereby the dynamic process of cluster emergence, growth and decline can be monitored and ports and freight and logistics operators can leverage off each other to drive and benefit from future opportunities.

Such strategies would inevitably require greater strategic cooperation between ports and their freight and logistics partners. Though we are confident that there would be gains from such cooperation, commercial sensitivities must be respected within a competitive market. These issues are explored further in chapter 6, where we sketch out the idea of a new representative body for the sectors that would provide the framework through which a growth strategy could operate.

Energy policy

As mentioned above, one of the prime economic capabilities of the North is the energy sector. This sector is critical for the national economy, and the major northern ports play a vital role in facilitating

its ongoing activities. Each of the major northern ports import and export the key materials required by northern energy generators and their network customers, working across a number of different energy technologies, including offshore and onshore wind, biomass, oil, coal, energy-from-waste, and carbon, capture and storage (CCS).

Energy generators and energy-intensive sectors have a significant reliance on the import and export of bulk fuels (crude oil, oil products, liquefied gas and coal), which is enabled by each of the major ports.

- The Port of Tyne processed 2.7 million tonnes of bulk fuels in 2014, about 40 per cent of its traffic by volume. It also processed 2.5 million tonnes of other bulks, which includes biomass, in 2014 (DfT 2015a).
- Tees and Hartlepool processed 23.2 million tonnes of bulk fuels in 2014, about 59 per cent of its traffic by volume (ibid).
- ABP's ports of Grimsby and Immingham processed 34.3 million tonnes of bulk fuels in 2014, about 58 per cent of its traffic by volume (ibid). It also supports the offshore and onshore wind industry, having committed to the £310 million Green Port Hull initiative (Green Port Hull 2015).
- Liverpool processed 11.7 million tonnes of bulk fuels (of which almost 10 million tonnes was liquid fuels) in 2014, about 38 per cent of its traffic by volume (DfT 2015a).

Perhaps the most prominent example of the ports' key role in the energy sector is the Drax power station which, as noted above, contributes 8 per cent of the UK's energy supply, and relies on biomass and coal imports through the North's major ports (Drax Group 2015). Some of those ports have invested heavily in biomass terminals to continue their vital work supporting Drax's supply chain, while the Port of Tyne has invested in facilities for another coal power plant that is due to convert to biomass, at Lynemouth in Northumberland (Port of Tyne 2016). The ports are also likely to continue to play a key facilitating role for offshore renewables, as these technologies require landside facilities for maintenance and servicing that can be provided by ports.

Conversely, the energy industry is also a key enabler of port operations. Many of the industries and clusters supported by ports, and co-locating with them, have intensive energy requirements, including advanced manufacturing, chemicals and steel, among others. This is also the case for the ports themselves, which must power their estates and provide facilities for refuelling docked ships.

As such, the government's energy policy is of fundamental importance to the northern ports. Many of the key energy operations listed above, such as offshore wind, are the direct results of active government energy policy. Any changes in policy can have profound effects upon ports, particularly as capital investments for energy infrastructure come at great expense and require large lead times. Indeed, recent changes in the government's energy policy have already had significant negative effects upon the ports. Prior to the recent implementation of the Contracts for Difference mechanism for funding renewable energy projects, ports complained of a lack of clarity in how incentives for renewables investment would be ensured in the long term (Arnold 2013).

Changes and uncertainty in energy policy also impact upon industrial clusters, directly affecting ports, which must anticipate the resultant developments in these industries and adapt accordingly. NEPIC, a leading chemicals and manufacturing cluster in the North, has identified a lack of clarity surrounding policy instruments, such as renewable fuel targets, as having had a direct impact on some of its operators (NEPIC 2016b). Uncertain and unstable policy impacts upon business investment decisions and increases the investment risk faced by industries, leading to negative effects that cascade throughout the freight and logistics chain and particularly into ports, which often co-locate with these industrial clusters.

Finally, internal port operations also feel the effects. An illustrative example is the case of liquefied natural gas (LNG) bunkering, which is seen as an effective way to reduce the cost and environmental impact of ships by powering them using onshore LNG rather than onboard engines while docked at a port. However, infrastructure to support LNG is very capital-intensive, with a long payback period. This necessitates certainty of energy policy and of LNG supply into the medium term, as recognised by TfN in the Freight and Logistics Strategy (TfN 2016 forthcoming).

Therefore, the northern ports require the government to demonstrate clarity, consistency and predictability in its energy policy, and the guidance given as to the pathway the UK's changing energy mix will take into the future, particularly as it works to meet its statutory carbon reduction targets. **We recommend that the northern ports and their freight and logistics partners call on the government to set out a clear, consistent and long-term energy strategy on which businesses – in the energy sector and their supply chains and ancillary industries – can plan future investment.** This strategy needs to balance affordability and security of supply with the necessity of long-term decarbonisation.

The logistics chain

Logistics is both an enabler for the economy and an economic sector in its own right. As such, the TfN independent economic review has concluded that the logistics industry is a key enabling capability for growth in the North. An effective logistics chain requires a number of elements, including well-maintained infrastructure that can cope with present capacity demands and react to future needs, the efficient use of the different multimodal transport options at the disposal of freight companies, and effective connection points between different modes of transport and the ports themselves. The trends explored in this chapter are impacting the North's logistics chain and have already imposed considerable capacity problems on the region's transport infrastructure, and these problems are set to grow into the future. Furthermore, funding as well as infrastructural barriers exist that are preventing a modal shift away from congested road routes and towards rail and coastal shipping. The infrastructure measures necessary to further support this modal shift to rail and waterborne freight will be addressed in the next chapter.

A related issue exists in that cargo and shipping companies are sometimes making decisions that may not be economically optimal when it comes to ensuring the cost-effectiveness of supply chains. These companies may not be fully aware of the available options for moving freight from the South East to final destinations in the North and beyond (including rail and coastal shipping as alternatives to road), or perceive that the most cost-effective and efficient way to move freight will be over land.

A case in point is the example of Taylors of Harrogate, the tea and coffee company, who historically imported goods into the Port of Felixstowe and then moved them by road to Bury St Edmunds where they were de-vanned, stored and delivered up to Harrogate. In seeking to reduce costs and carbon emissions, Taylors worked with Teesport to develop a port-centric logistics solution whereby containers were delivered to the port and de-vanned, stored, and eventually delivered for blending. With more containers being stored at Teesport, Taylors needed less buffer stock at Harrogate, which reduced storage requirements from 11 to 2–3 days, saved 130.9 road miles for each vehicle moved from Teesport and Harrogate, and saved 6.3 kg of CO₂ per vehicle (PD Portcentric Logistics 2013).

The ports are already engaging in efforts to assist cargo firms. For example, Peel Ports have identified 200 million miles in road journeys could be saved between 2015 and 2020, with cargo companies saving as much as £400 per container by changing their supply chain routes (Peel Ports 2016b). Peel's £500 million investment in the Liverpool2 deep water container terminal and the tri-modal warehousing and distribution facilities along the Manchester ship canal has been made to bring freight corridors closer to market opportunities and reduce capacity constraints. In an effort to ensure cargo and shipping companies are both aware of and able to exploit these efficiencies, Peel have created the 'Cargo 200' campaign, which seeks to build a partnership between 200 cargo owners and importers and exporters and the Port of Liverpool to support freight movements in and around Liverpool2 (Peel Ports 2016b). Similar efficiencies could be made across the North, and it is in the interests of both cargo and shipping companies to reassess and rationalise their supply chains, as well as the regional and national economy. **We therefore recommend that the ports adopt a pan-northern initiative to collectively support freight and shipping companies to identify more cost-effective and sustainable movements. This initiative could build on existing examples, such as Cargo 200, and would need to work alongside these and other marketing initiatives, as well as consider commercial and competitive sensitivities. Chapter 6 explores the idea of a regional port and freight and logistics body that would provide the forum through which these considerations would be discussed and appropriate measures agreed upon.**

4. INFRASTRUCTURE

Ports are the gateways through which nearly all of the UK's import and exports are handled. To fulfil this function effectively, ports and their freight and logistics partners rely on resilient, high-capacity infrastructure from the points of entry to consumption. In particular, the northern logistics chain requires effective road and rail corridors across land, intermodal connections to allow seamless transition from water to road and rail and vice versa, connectivity to ports, and robust infrastructure within the ports themselves. If any elements of the North's freight infrastructure are deficient or under-capacity, congestion will be the result, and this will directly affect the attractiveness of the region as a place to do business.

The North handles a disproportionately large volume of the UK's total freight traffic. While the region is home to around 24 per cent of the total population, and contributes about 20 per cent of total GVA, it transports 56 per cent of the UK's rail tonnage, 35 per cent of its road tonnage, and accommodates 35 per cent of total port throughput (TfN 2016 forthcoming). Large volumes of freight movements require strong multimodal infrastructure, and the North is home to considerable logistical assets, including three Strategic Rail Freight Interchanges (SRFIs), five Intermodal Terminals, strategic highway and rail networks serving both east-west and north-south corridors, and a large distribution centre capacity (TfN 2016 forthcoming). The major ports are served by strong rail connections and link to a network of inland waterways, including the Manchester ship canal.

This chapter will explore the problems with the region's physical infrastructure, the infrastructure of the ports themselves, and the institutional barriers to progress, and, in turn, provides a number of recommendations for how ports and the freight and logistics sectors can move beyond the unsustainable status quo.

4.1 NORTHERN FREIGHT INFRASTRUCTURE

The North's transport system must serve present and future growth opportunities across a wide hinterland. Established and developing or emerging industries need reliable connections to key corridors and to export markets, through the ports, which enable them to grow and realise their potential. However, it is already well recognised that the road and rail network in the North is insufficient to support present and future capacity needs for both passengers and freight. Already, many of the trends in freight volumes and frequencies described in chapter 3 are impacting upon the region's infrastructure, driving capacity problems and road freight movements that are both inefficient and unsustainable. This is partly the result of inadequate physical infrastructure, and partly

a consequence of institutional barriers that prevent a modal shift away from congested road routes and towards rail and coastal shipping.

The need for a modal shift

To better understand these problems, Transport for the North has developed the first pan-regional Freight and Logistics Strategy with the objective of identifying policies and infrastructure that would 'maximise the efficiency of the movement of goods to, from and within the north of England to contribute to the transformation of the economy of the northern powerhouse' (TfN 2016 forthcoming).

In reviewing present and forecast freight movements within the North, the strategy identified three major problems.

- 1. Road freight continues to dominate:** around 80 per cent of the North's road freight tonnage is domestic traffic (that is, goods produced and consumed in the UK), with much of this being short-haul, which is harder for rail to compete for and so the already heavy burden on the strategic road network is set to continue as traffic volumes are forecast to rise. This will require significant investment to ease the growing capacity burden.
- 2. Freight is being moved inefficiently:** longer-distance freight movements are dominated by south–north flows, most of which move through the road network, which, as TfN has concluded, 'may not reflect optimal locational, modal and mileage outcomes' (ibid). For instance, half of all containers arriving in southern ports ends up north of Birmingham, much of it via the Strategic Road Network (Peel Ports 2015). As such, it is desirable to rebalance container movements from road towards rail and coastal shipping through the North's ports.
- 3. Road and rail are overcapacity:** there are high concentrations of freight movements on a small number of stress points across the North's road and rail network, all of which also cater to large volumes of passenger car and train demand. In particular, a number of 'pinch points', of large volumes, exist in the last several miles between the strategic road and rail networks and the ports. Altogether, the resultant congestion imposes high-capacity burdens and reduces the efficiency of movement between freight and logistics sites. In particular, freight movements are constrained across the east–west axis, from Liverpool and Manchester in the west to Hull and Newcastle in the east.

These problems are imposing, and will continue to impose, large costs on the region. TfN has concluded that the current programme of road and rail upgrades 'will at best, keep pace with demand' and are absent of the institutional means by which to change the investment and locational patterns of freight and logistics that would be needed to overcome capacity and efficiency problems (TfN 2016 forthcoming). As a result, TfN forecasts a decline in rail freight under a 'do minimum' scenario, and a growth in road freight of around 25 per cent by 2043. The resultant increase in congestion across the road network is expected to cost as much as £500 million per year by 2043. Of particular concern is the impact this would have on the ability of the North to capture the significant opportunities from planned increases in port capacity, including those arising from Liverpool2, the

redeveloped and expanded lift-on/lift-off (lo-lo) terminal on the Tees, and the planned expansion of short-sea lo-lo and roll-on/roll-off (ro-ro) facilities on the Humber (ibid).

Modal shift I – from road to rail

It is clear that infrastructure is required to rebalance freight movements from road to rail and coastal shipping, which will require the upgrade of transport networks and the multimodal connections that serve them. In particular, the need for enhanced capacity and efficiency on the east–west corridors in the North has been recognised by wider northern powerhouse work, including by the National Infrastructure Commission in its *High Speed North* report, which called for planned investment funding in road capacity to be brought forward, alongside funding to identify and assess proposals for tackling a range of other strategic challenges in this regard (NIC 2016). However, these proposals belied a prioritisation of passenger transport over freight, particularly with regard to rail investments. While a focus on passenger movements is important, given the much larger volumes of passenger travel in the North expected in the future and the capacity that could be freed up for freight, the aforementioned problems require direct intervention (Frontier Economics 2016).

As such, TfN’s Freight and Logistics Strategy has provided a number of measures to achieve this (TfN 2016 forthcoming).

- The development of 50 hectares of rail- or water-connected multimodal distribution parks (MDPs) per year, minimising the cost of onward distribution by road, enabling sustainable access to employment and futureproofing for the potential longer-term introduction of low/zero carbon ‘last mile’ distribution solutions.
- Rail network upgrades to allow 20 per cent longer freight trains to operate on a six-day basis – particularly increased capacity on the East Coast Main Line, Midland Main Line, West Coast Main Line and trans-Pennine lines.
- The promotion of short-sea shipping (particularly for unitised freight) to bring cargo directly to northern ports, facilitated through the provision of liquid natural gas bunkering infrastructure at ports to enable its use as a cheaper marine fuel alternative, making longer trips to northern ports more competitive.
- Complementary landside access improvements to ports to reduce local road congestion, most importantly along the route of the M62/M60 north of Manchester and into Hull and Liverpool.

TfN expects that large benefits will accrue from these investments, including **£34.7 billion of benefits to the UK economy** from lower costs and **£13–£20 billion of GVA benefits to the northern economy**, which primarily come through the creation of between **25,000 and 38,000 additional northern jobs by 2033** and a 5 per cent and 13 per cent increase in the North’s UK container shipping and freight ferry market shares, respectively (ibid). TfN expects these investments to be driven by the public sector, including from the £13 billion the government has committed to northern transport over the parliament, and complemented by private sector investment.

The northern ports and freight and logistics sectors have fed into TfN's work at all stages, and their continued support will be crucial in delivering the infrastructure investments required to overcome the North's connectivity problems. As with all infrastructure projects, these investments will have long lead times, from approval through to the leveraging of capital, and to construction itself. However, in the meantime, congestion and transport inefficiencies will continue to grow. As such, it is imperative that the ports and their freight and logistics partners work with TfN to identify and introduce intermediate measures to ease capacity burdens, counteracting any wider focus on passenger movements within the northern powerhouse agenda.

An area that could provide high gain at low cost is upgrading rail gauge within the North. TfN has identified a lack of sufficient high-gauge capacity for freight across the North, particularly on the trans-Pennine route, and loading gauge access to ports, SRFIs and MDPs on intermodal routes. During our investigation, it has come to light that upgrading and standardising the gauge of the existing east-west rail corridor could be achieved at a cost of approximately £100 million. This is a relatively small amount in comparison to the more than £40 billion the government has committed to investing in Network Rail for control period 5, from 2014 to 2019 (ibid). Upgrading the gauge across the east-west corridor would develop the capability of the line, increasing the size of containers that could be carried, and ensure standardisation.

Therefore, **we recommend that TfN work with Network Rail to prioritise the creation of an east-west freight supercorridor in the North** by accelerating gauge improvements on this axis.⁷ This would be a significant and relatively low-cost first step in building a more resilient freight corridor, and investment could be accelerated ahead of future capacity development, complementing the ongoing work set out by TfN's Freight and Logistics Strategy. Furthermore, the movement of freight volumes onto rail would assist in easing capacity burdens for passenger journeys on the North's roads, and also have positive spillover effects for freight in that regard. While gauge clearance provides additional capability to the strategic rail network across the North, it does not necessarily provide greater capacity for additional freight trains. As such, investment in freight infrastructure, in conjunction with planned increases in passenger services, must prioritise capacity alongside capability.

While emphasising the importance of east-west connectivity, it is important to remember that east coast ports – and the Port of Tyne in particular – also have important north-south connections, not least with Scotland. North-south road and rail connections are also poor, with significant road bottlenecks on the A1 north of Newcastle. This will be partly addressed by the small number of planned improvements, but there remains considerable opportunity to further enhance connectivity with Scotland.

⁷ We also recognise the importance of road freight and the key role it must, and will, continue to play in northern connectivity, and the vital functions the ports provide in connecting the North to Scotland and the south of England. We welcome the ongoing work of TfN in this regard.

Modal shift II – from road to coastal shipping

While significant infrastructure investment is required to alleviate the North's capacity and efficiency problems, a modal shift towards rail and coastal shipping also requires changes to the grant structures that incentivise freight providers to use particular transport modes. In particular, around half of imports that arrive in the south eastern ports head north of Birmingham, many of them being moved along the strategic road network (Peel Ports 2015). As TfN has concluded, this state of affairs is far from optimal and imposes costs in terms of lost efficiencies from unnecessarily long journeys, higher air pollution relative to rail and coastal alternatives, and greater congestion on south–north and east–west corridors and at key nodal points (TfN 2016 forthcoming).

The benefits of a modal shift from road to rail and coastal shipping – by 'feeder' freight from the southern to the northern ports – are already well recognised by the government. The Waterborne Freight Grant (WFG) scheme offered by the Department for Transport (DfT) seeks to assist companies with the operating costs of running water freight transport instead of road for up to three years. It does so with the stated objective of 'generating environmental and wider social benefits from reduced lorry journeys on Britain's roads' (DfT 2015b). The scheme is similar in principle to the Mode Shift Revenue Support (MSRS) scheme also run by the DfT, which assists companies with operating costs associated with running rail or inland water freight transport instead of road.

Ports are supportive of the WFG in principle, as it recognises a need to incentivise modal shift to waterborne freight. However, uptake of the WFG has been low relative to the MSRS. Ports and their freight and logistics partners are concerned that the MSRS overwhelmingly favours modal shifts to rail freight rather than to water freight, because the MSRS is awarded on a per-container basis while the WFG is offered as a bulk scheme. As the break-even costs of waterborne freight are higher than rail freight, there is a disincentive for waterborne freight until a critical mass of volume is reached, making it more difficult to apply for the WFG. Offering the WFG on a similar per-container basis could enable coastal shipping to compete on an even playing field with rail freight. These concerns were also raised in response to the DfT's 2014 review of the MSRS and WFG (Arup 2014b). Furthermore, the funds offered by the schemes are relatively small: the MSRS provides about £20 million per year (DfT 2016b) for a freight industry that has a turnover of about £800 million (TfN 2016 forthcoming). No funding has been awarded through the WFG (DfT 2016b).

The National Policy Statement for Ports identifies a modal shift from road to coastal shipping as a potential mitigation measure against traffic congestion and strain on inland infrastructure, and states that this should be broadly encouraged (DfT 2012). It states that target modal shares for rail or coastal shipping may be appropriate, but that the main emphasis should be on incentive mechanisms rather than rigid target-setting. Generally, the policy stance appears to be that coastal shipping can be encouraged by ports and should be pursued on a commercial basis (ibid). Furthermore,

there is no explicit mention of the need to promote a modal shift in the National Planning Policy Framework (DCLG 2012).

Therefore, **we recommend that central government promote rail and coastal freight opportunities by reforming the Mode Shift Revenue Support and Waterborne Freight Grant and providing clear guidance in the National Planning Policy Framework and National Policy Statement for Ports on how a modal shift can be supported.** In particular, clarity is needed on how these grants can work in conjunction with TfN's investment programme. Many of the inland connections to ports identified by TfN are crucial in ensuring the price competitiveness of the end-to-end delivery of cargo using waterborne freight. Similarly, public sector support for LNG bunkering and cold ironing infrastructure can further reduce the costs of waterborne feeding from south to north, as well as maximising environmental benefits of this mode over long-distance inland road freight (TfN 2016 forthcoming). Reforms and guidance must be developed in conjunction with key ports and freight and logistics stakeholders, and should complement existing schemes. These include Cargo200, which is already working to encourage a modal shift to short sea shipping (Peel Ports 2016), and the Logical Link East Coast feeder service between Felixstowe and Teesport, which has existed since 2008 to move containers off the road network (PD Ports 2016c).

4.2 PORT INFRASTRUCTURE

An efficient and resilient logistics chain also requires robust infrastructure within the ports themselves. Ports are often seen as nodal connections to the wider supply chain. This betrays the fact that ports are themselves elaborate systems with their own internal operations and infrastructure needs and challenges. In principle it is clear that the costs of infrastructure within port boundaries should generally fall to the ports themselves as privately owned or funded (such as the Port of Tyne) entities. However, the public sector also plays a role in ensuring that policy does not place disproportionate constraints on the development of this infrastructure.

The role of local and combined authorities

In responding to growth in freight volumes and ship sizes, ports must grapple with the physical constraints imposed by the limited land upon which they can operate and expand on to. Land management and expansion is also governed by the policies of local and combined authorities, which administer everything from planning rights to EU policies, such as the designation of special protected areas (SPAs), which, in accordance with the EU birds directive, protect rare and vulnerable birds and migratory species. Primarily, it is the local planning authorities (LPAs) that control the use of port land, though port operators benefit from 'permitted development rights' allowing a number of port activities to be undertaken without the necessity for planning permission. Nonetheless, local authorities have an important role to play in helping ports respond to changes in freight volume and type, and any land requirements that may arise therefrom.

We believe that the northern ports require more active support from local and combined authorities with regard to identifying and overcoming policy barriers to development of land and new infrastructure. Based on the local port growth strategies described above, a more activist approach is required to drive regional infrastructure requirements. For example, ports and their customers have identified a number of underutilised infrastructure corridors around the ports themselves – including pipelines and privately owned roads – that could provide regionally significant assets. Currently these corridors are under private ownership and many remain inactive because the costs of dismantling them are prohibitive, or because they may serve a useful purpose in the future. There could be a role for policy in facilitating access to these corridors for mutual benefit to ports and the surrounding industrial clusters.

As such, it is crucial that those local and combined authorities with ports and other key freight and logistics operators and infrastructure actively engage with these sectors. In particular, based on local port growth strategies, they must work with the ports to identify current and future growth areas and highlight the potential barriers to supporting their development well ahead of time. Currently, central government has a voluntary requirement that ports produce a master plan, the purpose of which is to clarify their strategic planning for the medium-to-long-term, so that regional and local planning bodies can revise their own development strategies accordingly (DfT 2008).

We recommend that a two-step process be introduced whereby all major ports produce a draft port master plan, followed by consultation with local, combined and other planning authorities to produce an adopted port master plan. With the input of local and combined authorities, these master plans would not only report the commercial and strategic intentions of the ports, but serve as an initial assessment of the land, policy and infrastructural constraints to their development on a case-by-case basis, providing strategic guidance for the owners and managers of regionally significant assets, such as piping corridors. In addition, they would work with any local port growth strategy in identifying future growth opportunities affecting ports, their assets and the resultant land, policy and infrastructural considerations.

Flood resilience

Another important factor affecting internal port infrastructure is the potential for flooding. An area at particular risk is the Humber estuary, which has a tidal range of up to six metres near its mouth (Tide Project EU 2016). In the future, climate change is expected to lead to higher sea levels around the UK and a greater incidence of severe weather, both of which increase the risk of tidal flooding on the coast and near estuaries (Defra 2015, Environment Agency 2010). As a result, there will likely be growing pressure on the flood protection offered by the estuary's existing defences, potentially exposing the major concentrations of industrial, commercial and residential properties that sit on the floodplain. Similar problems are faced by ports on the Mersey, Tees and Tyne estuaries (Environment Agency 2009a, 2009b and 2009c)

As such, flood protection is a key priority for the ports, and the surrounding areas. The capital requirements for flood protection are considerable and so active engagement between the public and private sector on how to proceed is necessary. In particular, the funding formula used by the Department for Environment, Food and Rural Affairs (Defra) is biased towards allocating funding to protect residential properties over industrial and commercial areas, meaning that ports struggle to secure public funding for flood protection. Indeed, the latest Humber Estuary Flood Risk Management Strategy has concluded that it is ‘impossible to unlock the funding required under current mechanisms’ as ‘current funding formulas do not sufficiently recognise the benefits of protecting important nationally critical assets and infrastructure, nor do they adequately recognise the opportunity to unlock significant growth that will contribute to the national economy’ (East Riding 2014).

Therefore, **we recommend that Defra revises its flood funding formula to more accurately consider the value of critical coastal assets**, pricing in their contribution to regional and national economic growth, as well as the importance of protecting residential and naturally significant areas. This would recognise the immense contribution of commercial properties, including energy security, economic growth and investment, food and fuel security, continuity of trade, and protection of people and the environment (ibid).

4.3 REGIONAL INSTITUTIONAL BARRIERS

Institutional barriers also exist at a regional level. As the TfN Freight and Logistics Strategy recognises, it is primarily the responsibility of the public sector to provide adequate infrastructure connections from ports to freight corridors to support growth clusters (TfN 2016 forthcoming). Indeed, ports need confidence that if private investment in their own internal capacity is made, corresponding investment will be made by the public sector to ensure this capacity is efficiently linked to the wider hinterland.

Balancing public and private investment

By the very nature of the sectors, private investment in freight and logistics infrastructure in the North is considerable, providing around **65 kilometres of quays, 12 million square metres of large warehousing** (that is, greater than 9,000 square metres in size), and around **190 freight locomotives and 130,000 HGVs** (TfN 2016 forthcoming).

Furthermore, the **major port operators have initiated or completed investments totalling over £1 billion over the last five years**, including the following high-profile projects:

- the £310 million Green Port Hull development at the Port of Hull
- the £300 million Liverpool2 deep-sea container terminal at the Port of Liverpool
- a £35 million redevelopment of 550 metres of deep water quay facilities and £10 million of new cranes at Teesport, coupled with other developments including a purpose built rail terminal at Teesport that amount to an investment of over £80 million

- a £30 million biomass facility, a £25 million extension to the Riverside Quay, and further biomass facilities estimated at a cost of around £100 million at the Port of Tyne.

While these investments are set to provide considerable value to the region, there are concerns about the comparative levels of investment from the public sector, particularly given the need for commensurate infrastructure improvements to support new traffic resulting from these port developments. To this end, the TfN strategy makes the case for public investment to complement the significant investments already being made by the major ports to their facilities, including:

- delivery of relevant road schemes to reduce operating costs from ports and inland terminals
- provision of capacity in line with demand in the rail sector
- ensuring MDPs are brought forward in suitable locations through the planning system, with the relevant funding required to achieve rail and water connections (TfN 2016 forthcoming).

Though these investments would complement existing private investments, and leverage others, there is still a need for a revision of public funding and cost-appraisal models, particularly where these disproportionately privilege passenger over freight infrastructure, to ensure public expenditure meets and keeps pace with existing and planned private investments and development. In order to do so, **we recommend that TfN works with the DfT to develop new models of scheme appraisal that better take account of the value of freight movements to the wider economy.**

The role of Transport for the North

TfN is the crucial agency through which the North will secure the funding and prioritisation needed to deliver its strategic infrastructure investment. Ports must continue to work with TfN to ensure that it is not only anticipative – pre-planning infrastructure investments to meet projected growth – but also adaptive, responding to emerging needs in the ports and wider freight sector.

The current five-year planning model, whereby expenditure is planned and committed to in five-year blocks, provides certainty with regard to where investments will be made in the medium term. However, while the public sector is moving in five-year planning blocks, ports and their partners are using longer time frames. For example: contracts with tenants on port land are often set between 10 and 15 years; contracts with large customers, such as the Drax power station and Nissan, last between 15 and 30 years; and much of the infrastructure investments being made within ports have time horizons of around 100 years. While we recognise that TfN are planning far into the future, with benefits modelled out to 2033 and beyond, public sector bodies need to ensure that their planning horizons fit with those that govern the ports' infrastructure investment strategies. Therefore, **we recommend that local and central government move beyond a five-year planning model to allow more anticipative infrastructure investment**, using the planning periods that are most suited to the ports and freight and logistics sectors.

As noted previously, the northern ports compete not only on the regional and domestic level, but also internationally, particularly with the large ports of continental Europe; the ports of Antwerp and Rotterdam in particular are major competitors for the North East. These ports are owned by municipal and central governments, and authorities not only pay for public access infrastructure such as railways, but also contribute towards investments in the development of ports; they may even settle losses suffered by port authorities (Barnard 2016). Given that the north of England's ports are not supported to the same extent, any public spending that is available must be invested as efficiently as possible to enhance the strengths of the North's freight and logistics assets. This can be achieved through the devolution of spending to the local level wherever possible, to ensure that investment is as targeted as possible to maximise access to national and international markets. To achieve this, **we recommend that public spending on key freight and logistics infrastructure be devolved to Transport for the North** to enable these funds to be more effectively allocated to projects identified by its strategies.

While devolution of funding would provide greater autonomy to northern freight and logistics priorities, there is also an apparent need for greater coherence and collaboration among the multiple agencies dealing with infrastructure in the north of England. While TfN's Freight and Logistics Strategy is a positive first step towards a coherent public sector approach to meeting the future needs of the region's freight and logistics sectors, and sets priorities with regard to road and rail infrastructure investment, there remains a great deal of complexity in this area, evidenced by the number of public infrastructure agencies actively considering options for the North, including TfN, High-Speed 2 Ltd (HS2), the National Infrastructure Commission, Highways England and Network Rail.

While we are confident that TfN will be able to provide more coherence to infrastructure strategy, particularly when it is made a statutory body in 2017, there appears to be a lack of certainty over the future role of Network Rail and Highways England in the North, which are the owners and managers of England's rail and road networks respectively. Of particular concern to ports and the freight sector will be ensuring that TfN, Network Rail and Highways England coordinate effectively.

The efficiency of strategic planning and infrastructure delivery could be improved by bringing more powers to a northern level, and so **we recommend that the key functions and powers of Network Rail and Highways England are devolved to Transport for the North**, ensuring all public infrastructure bodies are integrated. As set out in IPPR North's original Transport for the North proposal (Cox and Raikes 2015b), this could be achieved in a two-step process. First, TfN would take on some of the responsibilities of Network Rail and Highways England in the two years following its confirmation as a statutory body. Thereafter, two new bodies, Network Rail North and Highways England North, would be formed with a single joint overarching board comprised of TfN, Highways England and Network Rail. This would ensure that road and rail development in the North is part of a cohesive and comprehensive northern strategy for both freight and logistics and for passengers.

5. LABOUR AND SKILLS

Ports are dependent upon diverse, highly skilled workforces, from engineers and heavy goods vehicle (HGV) drivers, to managers and communications specialists. As such, training and retaining a skilled workforce is a core concern of the northern ports. Graduates and apprenticeships with STEM (science, technology, engineering and mathematics) qualifications are particularly important, and the skills requirements of port operations are constantly changing as new technologies emerge. Furthermore, the labour market for ports does not sit in isolation and is shared with the broader freight and logistics sectors in the North and across the UK, and with the industrial clusters upon which their operations depend. This necessitates a coordinated approach to maintaining a skilled workforce, and to attracting new talent and retaining existing talent to the region.

The northern ports and freight and logistics sectors face a number of challenges in the labour market that are being driven by demographic and technological changes, now and into the future. Already, many of the ports are responding with apprenticeship and outreach programmes that seek to attract and train the next generation of engineers, managers and drivers. But the challenge is too great for individual ports to bear in isolation, and coordination could provide mutual benefits. This chapter looks at the diverse skills requirements of the freight and logistics sectors, explore the opening up of skills gaps, and the response made by the ports, and then provides a number of recommendations on how the ports can attract, train and retain a skilled workforce fit for the future.

5.1 TRENDS AND CHALLENGES IN THE FREIGHT AND LOGISTICS LABOUR MARKET

Ports and the freight and logistics sectors have a large number of skills requirements. Operators of cargo ships and tugboats guide them into berth. Dockside workers must be able to carry out work ranging from manual labour to operating high-tech machinery such as forklifts and cranes to unload and load ships' cargo to and from trucks and trains. Once loaded, qualified HGV drivers and train operators are required to carry cargo on, either to its final destination or to a distribution centre where it can be transferred to another vehicle for final delivery to supermarkets, manufacturers and any number of other destinations. Logistics managers throughout the supply chain oversee end-to-end operations, to ensure that movement of goods is carried out as quickly and cost-effectively as possible. Corporate employees are required to ensure that port, freight and logistics businesses are operating effectively by providing leadership, formulating strategy, overseeing finances, advertising services, seeking new clients, and managing human resources – as in any other commercial enterprise.

Those industrial clusters upon which ports depend also have high-skill requirements, particularly in advanced manufacturing, energy, health innovation and digital technology (TfN 2016 forthcoming). Indeed, there is a high transferability of skills within the ports, freight and logistics sectors, and between these sectors and the industrial clusters they support, such as the automotive industry. Agglomeration effects increase employment density, access to specialist skills, and knowledge and employment exchanges, all of which are driven by the proximity to national and international markets provided by ports and their freight and logistics partners (ibid). Furthermore, these skills requirements are well served by the universities and further education providers in the North, which have relatively strong graduate retention rates (Ball 2015). However, while the North provides a fertile employment environment for the ports and their freight and logistics partners, a skills gap is opening up, driven by demographic and technological change.

The skills gap

Throughout our research process, we have found a constant concern about the opening up of skills gaps in a number of key positions in the sectors, including HGV drivers, management, and STEM-qualified workers, particularly engineers. This is partly corroborated by existing studies into the workforce.

There is a well-recognised lack of HGV drivers in the UK. The All-Party Parliamentary Group for Freight Transport (APPGFT) has found that employment in the primary movement of freight, including drivers, train drivers, shipping captains and pilots has, on average, a 30 per cent shortfall (APPGFT 2015). The Group concluded that this is due to the high cost of training, often at the individual's expense, and applicants' lack of freight experience, combined with failings by government and industry to act in a coordinated way. This shortfall increases as the economy improves and grows, with a low retention rate within the sector as drivers often leave to seek more lucrative options after having received the benefits of training.

Furthermore, the UK freight and transport sector's workforce is ageing. The APPGFT, in its January 2015 *Barriers to Youth Employment in the Freight Transport Sector* report, found that an average of 40 per cent of roles in the sector have an ageing employment profile (ibid). Of particular concern is the fact that 60 per cent of HGV drivers are over the age of 45, compared to only 2 per cent under the age of 25 (ibid). Addressing this issue is of crucial importance as thousands of workers in the region's port and logistics sector retire in the years to come.

There are also challenges and opportunities associated with the increasing complexity of work arising from technological innovation. This is already evident in a number of areas, where automation of processes – including cranes, logistics and other technical port operations – requires greater understanding of information technology (IT) systems. For instance, as part of its Liverpool2 upgrade, Peel Ports has established a 'virtual' training simulator onsite to ensure its operators are ready to operate its new cranes (Peel Ports 2016c). The nature of work on the ports is changing, and the training and experience required to do it is changing accordingly. Ensuring that this training is available, and that the skills in the workforce match the

requirements of employers in the sector, is an ongoing challenge, and one that is set to accelerate as ports adopt more automated processes.

As such, there is a growing trend among the ports to train workers in a broad range of skills, in order to make them as adaptable and flexible as possible in carrying out any work required onsite. This includes adapting to new IT and logistics systems and technologies, training in safety requirements arising from new equipment and ways of working, engineering proficiencies, communications nous and offshore skills. In particular, there is a need to raise the level of management skills in the workforce with regard to technological change and the resultant management of new risk and health and safety requirements. Ports must also adapt to the new skills requirements arising from the growth of new and existing industrial clusters and changes in their freight and logistics requirements. These changes are set to accelerate into the future as technological changes in the North's prime and enabling economic capabilities continues (TfN 2016 forthcoming), and ports must be anticipative and adapt to new changes ahead of time.

5.2 ATTRACTING, TRAINING AND RETAINING A SKILLED WORKFORCE

Identifying and closing skills gaps

Northern ports already work with a number of port-centric maritime clusters and prominent educational providers to address their skills requirements. Hugh Baird College in Bootle will soon launch Port Academy Liverpool, a specialist academy within the college to train skilled workers to contribute to the £1.8 million SuperPort project.⁸ The training facility will provide a one-stop-shop for port operations and maritime logistics-related training courses. It will offer programmes for 14- to 16-year-olds, and apprenticeships will be offered to over-16s, along with foundation degrees and professional accreditations (Hugh Baird 2013). Similarly, the Port of Tyne has made use of the proximity of the South Shields Marine School at South Tyneside College, offering its apprentices training in a range of business areas, including security, marketing, business administration, port operations and warehousing. The partnership between Port of Tyne and South Tyneside College supports the biggest apprenticeship programme in the port's history, part of a £1.3 million investment in training and development across the port (Port of Tyne 2013).

At the national level too, some schemes do exist for training the future workforce. Port Skills and Safety (PSS) is the UK's national professional ports health and safety organisation. It was set up in 2002 as a joint venture between UKMPG and the BPA, and it exists to promote and raise health, safety and skills standards in ports. The national framework for maritime occupations provides guidance to employers in the maritime sector seeking to take on apprentices, with pathways allowing apprentices to become qualified in a number of pathways, including seafaring/tug operation, port operations and the merchant navy (deck work, engineering and officer). The framework itself notes that the organisations contributing to it – which include UKMPG, BPA

⁸ The SuperPort project will integrate a number of logistics assets in the Liverpool City Region, including Port of Liverpool, Liverpool John Lennon Airport, led by the Liverpool City Region LEP.

and PSS – have ‘an aging workforce and are seeking ways of attracting good quality new entrants who will make a career in the sector’ (Skills for Logistics 2015).

While some studies have corroborated the existence of skills gaps within ports and the wider freight and logistics sectors, no comprehensive skills assessment has been undertaken across the North. Taking a forward-looking, adaptive approach to managing skills and labour requirements necessitates a more informed understanding of the skills gaps that exist now and in the future. As such, **we recommend that the northern ports work with their freight and logistics partners, as well as key industry clusters, to commission a skills gap assessment to identify both current and future skills requirements.** This assessment would identify skills gaps where they currently exist, as well as drawing on projections around future trends in the labour force, as driven by developments in the North’s economic capabilities, to forecast future skills demand.

Such an assessment would also have to investigate sector attractiveness, the forces driving these skills gaps – such as training costs, awareness and promotion of opportunities – and competition from other sectors and regions. Indeed, a major area for investigation is the effect of uncertainty in government energy policy and the lack of an explicitly industrial strategy for the North, and the UK. Uncertain policy can disrupt the flow of the labour market, and in the absence of clear signals that specialist work will remain in the region, temporary unemployment for skilled workers could lead them to leave the North altogether. As such, the skills assessment should work in conjunction with the local ports growth strategies set out in chapter 3.

Liverpool Maritime Knowledge Hub

On 14 March 2016 the first phase of the new Maritime Knowledge Hub in Wirral was opened. The facility is expected to be an education and collaboration campus for maritime research and development, education, and business support. It will include serviced business startup spaces, an offshore survival centre and marine simulation centre, and a state of the art facility to help manufacturers design, test and build products and services. Its overarching objective is to provide the next generation of innovators and entrepreneurs in the maritime and associated sectors to support the northern powerhouse agenda (Walker 2015).

The hub will be operated jointly by sector development agency Mersey Maritime and Liverpool John Moores University, and aims to be a global centre of excellence within the UK, generating knowledge-led growth and innovation in maritime technology, skills and services. The hub is a partnership which includes Mersey Maritime, Liverpool John Moores University, Wirral council, Peel Group and Peel Ports, and is supported by the Liverpool City Region LEP. The hub seeks to leverage off the maritime cluster in the region by bringing together its key maritime assets and expertise, and creating skilled maritime jobs on Merseyside (DfT 2016c).

Where appropriate, the North's major ports should explore how these successful subregional educational initiatives might be scaled up to service the entire North. A region-wide port and logistics skills and training academy, modelled on existing initiatives, could create sufficient critical mass to both build the necessary skills and provide a unified voice in the North to promote the sector to young people. **We recommend the creation of a Northern Maritime Knowledge Hub**, with one option being the scaling up of the existing Merseyside initiative. The hub would take the skills gap assessment as its starting point and work with existing national and regional education schemes to provide means by which ports and their freight and logistics partners can seek to train their workforces. While a regional focus is desirable, in practice the lead may have to be taken at the local level to allow flexibility, given potential variations between the regions of the North and the specialisms of ports and their industrial clusters and the resultant labour and skills requirements. Furthermore, local and combined authorities have a role to play in facilitating relationships between ports and universities and other education providers and inputting into thinking on strategic requirements for regional skills, though the Hub would, in the main, be led by industry.

Attracting a skilled workforce

The northern ports and freight sector, much like their national counterparts, also face a lack of exposure in the labour market. There is a general problem with the visibility of freight and logistics as a potential career option. There is a general lack of understanding about what those sectors that contribute to end-to-end logistics actually do, and their importance as essential foundational elements within the economy and wider society. This extends to the ports and the understanding that ports are an integral element of the logistics chain in the UK, which, as an island nation, has relied on maritime prowess for hundreds, if not thousands, of years. The problem is acute. According to the APPGFT, "the term "logistics" is largely unrecognisable to young people, or is associated solely with road freight drivers; 66 per cent of 14-19 year olds misunderstood the term "logistics" (APPGFT 2015).

A lack of visibility is confounded by how competitive careers education has become at secondary school, with young people being encouraged to consider their future careers before entering key stage 4. Pre-GSCE-level education encourages young people to begin focusing on subject areas that prepare them for further study aimed towards specific career paths (ibid). It is at this stage that young people need to be made aware of the opportunities for careers in ports, and freight and logistics in the North if the sectors are to attract the next generation of talent. Indeed, it is arguable that education on the importance of the logistics chain is a public good that should be provided by the education system, as part of an understanding of how the economy and wider society function.

Efforts have been made to reach out to young people and promote the ports and logistics sector as a rewarding career prospect, and these efforts have largely been positive. The High Tide Foundation, established by PD Ports in 2012, has sought to provide the necessary support to raise awareness and aspirations for young people, encouraging them to consider employment opportunities in marine and related industries at Teesside (High Tide Foundation 2014). The Foundation links industry

and education across Teesside to provide students and educators with an insight into how maritime businesses operate, while also showcasing employment opportunities. Beyond its general promotional functions, the Foundation seeks to expose young people to the entire supply chain and the myriad of different opportunities available in the marine sector (not just port work). It offers a number of programmes including visits to ports, a cadetship programme for people between 12 and 14 years of age, and apprenticeships (ibid). Furthermore, PD Ports' logistics division, PD Portcentric Logistics, has worked with Stockton Riverside College and Career Ready to launch a Logistics Academy on Teesside, which works with logistics providers and businesses to open opportunities in the sector to young people.

Similarly, efforts led by local government and LEPs seeking to promote cities and regions as places to work have also had some success. For example, Hull was announced the winner of UK City of Culture 2017 in 2013, and its efforts to promote the city as a place to live and work in have been commendable. The 2017 programme of events and associated publicity offers a unique opportunity to showcase the city, and the wider region, as a destination (Hull City Council 2016). However, all of these efforts have largely been made in isolation; there is no clear coordination across the region, within the sector or among the ports in this area. The industry needs to work with LEPs and other regional bodies to ensure that it presents a unified voice when promoting careers for young and qualified people in the sector. Therefore, **we recommend that the Northern Maritime Knowledge Hub establish an ongoing campaign to promote the northern ports, freight and logistics sector** as a rewarding career prospect, and to develop understanding of its foundational importance to the UK economy and wider society. This campaign could build on or link with the existing work of the UKMPG and the wider national picture, where appropriate. Furthermore, a particular focus of the campaign should be on the highly skilled and technical nature of work in the port and logistics sector, and it should coordinate with STEM education providers to ensure young people are aware of the benefits and means to enter technical careers.

Retaining a skilled workforce

Retaining a skilled workforce requires not just adequate employment opportunities, but good living conditions and access to all the North has to offer. In particular, infrastructure must also serve those who work in the ports and the freight and logistics industries – TfN recognises that the region's transport infrastructure must 'provide the capacity and journey times to accommodate large volumes of commuting across the North, efficiently and affordably' (DfT 2016a). As such, ongoing efforts to improve infrastructural connections in the North, particularly through the work of TfN and its partners, will benefit the port and logistics sector not only by improving freight traffic capacity and options, but also by expanding the options available to their employees in the North. Intercity road and rail connections will allow workers to commute from the larger urban centres such as Liverpool, Manchester, Sheffield, Leeds, Hull and Newcastle, and these links can drive the retention of high-skilled workers within the North. An understanding of these effects must continue to feature prominently in the ports' strategic thinking around infrastructure.

6. STRATEGIC COOPERATION

This report has identified a number of pressing trends and challenges facing the major northern ports and the region's freight and logistics sectors. In turn, we have provided a number of recommendations to overcome these challenges, exploit inherent opportunities, and realise the key role these sectors play in driving the North's economic success. A summary of these recommendations is set out at the end of this chapter. While many must be taken forward by the ports and freight and logistics sectors themselves, local and central government and public bodies are integral to ensuring these sectors can realise their potential. In doing so, these recommendations call for an unprecedented degree of strategic cooperation among the major northern ports, between ports and the wider freight and logistics sectors, and between these sectors and key public sector bodies. While some of these recommendations could be pursued in isolation by the major ports, the ability of individual ports to influence regional and national institutions is limited. Therefore, the best means of successfully addressing the challenges facing the industry is to present a unified, coherent voice to government, industries and the public.

6.1 A NORTHERN PORTS, FREIGHT AND LOGISTICS ASSOCIATION

The existing port industry associations – the UK Major Ports Group (UKMPG), which represents major ports, and the British Ports Association (BPA), which serves the entire sector – have a mandate to represent their members throughout the UK. This means that, while the UKMPG and BPA provide a national voice, they are constrained in the extent to which they can advocate specifically for the northern ports and those northern issues that affect them. As this report has shown, it is imperative for both the ports and the regional economy that the northern freight and logistics sectors are provided with the means by which they can overcome the pressing trends and challenges facing them. This will require a level of cooperation across private and public sectors and throughout the region and the UK that does not currently exist.

Therefore, **we recommend that the major northern ports bring together their freight and logistics industry partners, along with supply chain customers, to form a Northern Ports, Freight and Logistics Association (NPFLA)** to drive progress towards addressing the trends and challenges facing the sector. The association would act as the focal point for driving progress on all of the recommendations in this report, and beyond. In doing so, it must be strategic and visionary, looking beyond day-to-day business issues and identifying the longer-term challenges facing these sectors in the North. It would be ambitious in its pursuit of growth in the North's ports and freight sectors, including by identifying and promoting emerging industry clusters in conjunction

with the local ports growth strategies and port master plans described in this report. It would then drive efforts to accelerate infrastructure investment in the region, and would do so while recognising and respecting commercial competition and sensitivity.

A Northern Ports, Freight and Logistics Association will need to work closely with the bodies responsible for the implementation of the northern powerhouse agenda, particularly Transport for the North. Establishing good working relationships with these organisations will allow the sector to present a unified and coherent voice and maximise the influence it can have on decisions about infrastructure and policy in the North. A representative of the NPFLA should sit on the board of TfN to ensure that freight priorities and concerns are reflected in TfN's decision-making.

Similarly, such an association would better enable the North's ports and freight and logistics sectors to engage with central, and European, government on issues specific to the North. Energy, environmental and industry policy, for example, are areas in which much greater clarity, consistency and predictability are needed from government. A NPFLA would spearhead discussions with government on these issues, driven by its mandate to serve regional interests. Supporting the existing national industry bodies, especially the UKMPG and BPA, would be essential – and indeed beneficial where the interests of the North align with the wider UK. Within this, the association should have freedom to advocate strongly in cases in which the North's interests diverge from those of others.

Perhaps one of the most powerful efforts a NPFLA could make would be to tell the 'northern freight story' of the end-to-end supply chain. The promotion of the freight sector, and the northern ports' role within it, should be a priority. A key challenge that the wider sector faces is its relative invisibility; promoting its role at the regional level, and at the national level, in collaboration with the UKMPG and BPA, would strengthen its image with potential workers and raise awareness in the international freight industry about the import and export opportunities available in the North.

6.2 CONCLUSION

The North's major ports, along with the wider freight and logistics sectors, are experiencing a number of profound challenges as the market contracts and the region enters a period of structural change. Global trends in supply and demand are driving larger shipping sizes and freight volumes, and the rise and fall of commodities and industries require ports to be responsive and adaptive to changing patterns of trade. These pressures have had cascading effects on national and regional infrastructure, with the road and rail networks already proving insufficient to meet the demand for higher-capacity, efficient freight corridors. Continued evolution in the sector also necessitates changes in the labour force and the skills requirements of workers in ports.

With these challenges come opportunities. The North's major ports are already implementing bold and ambitious investment projects to overcome present and future challenges in freight and shipping, and to capture

opportunities in emerging industry clusters. However, the investments being made by ports to enhance their capacity and capabilities require complementary public infrastructure to connect them to the northern hinterland. Similarly, they require a greater level of clarity and certainty from the government with regard to investment strategies and policy. As such, it is evident that the public sector needs to take a more active role and support the ports as they play their central role in realising the northern powerhouse vision. The initial efforts of Transport for the North to create a pan-northern freight and logistics strategy are promising, but more must be done to ensure that the public sector is providing the guidance, cohesion and support the region needs in freight and logistics. Furthermore, the ports themselves need to act on an understanding of how cooperation will not just provide mutual benefit, but is the essential component in facing up to a future of unprecedented challenge. Ports can and must make a major contribution to the North and be able to respond to and influence those government policies that allow this.

With an understanding of the challenges facing them as a sector, the time is right to consider how the major ports of the North could – while respecting competition and commercial sensitivity – come together to present a single unified voice towards industry, government and the public on issues of shared concern. The formation of a Northern Ports, Freight and Logistics Association would bring the considerable resources of these sectors to bear in overcoming the problems they face, enabling them to maximise their role in shaping the region's future, continuing their historical role in ensuring a connected, vibrant North.

7. SUMMARY OF RECOMMENDATIONS

The northern ports, freight and logistics sectors

Recommendation	Policy area
Establish a Northern Ports, Freight and Logistics Association to drive strategic cooperation within the ports and freight and logistics sectors and across all policy areas.	Strategic cooperation
Adopt a pan-northern initiative to collectively support freight and shipping companies to identify more cost-effective and sustainable movements.	Supply and demand
Create a Northern Maritime Knowledge Hub .	Labour and skills
This Northern Maritime Knowledge Hub should establish an ongoing campaign to promote the northern ports, freight and logistics sectors .	Labour and skills

Local government and other subnational partners

Recommendation	Policy area
Create a local port growth strategy in conjunction with ports, LEPs and the wider freight and logistics sector, focusing on opportunities in emerging industry clusters, energy and logistics.	Supply and demand
Local, combined and other planning authorities should produce an adopted port master plan with ports.	Infrastructure
Transport for the North works with Network Rail to prioritise the creation of an east-west freight supercorridor by accelerating gauge improvements on this axis as part of wider passenger capacity improvements.	Infrastructure
Transport for the North works with the Department for Transport to develop new models of scheme appraisal that better take account of the value of freight movements to the wider economy .	Infrastructure
Move beyond a five-year planning model to allow more anticipative infrastructure investment, using planning periods most suited to the ports and freight and logistics sectors.	Infrastructure

Central government

Recommendation	Policy area
<p>Set out a clear, consistent and long-term energy strategy on which businesses – in the energy sector and their supply chains and ancillary industries – can plan future investment.</p>	Supply and demand
<p>Reform the Mode Shift Revenue Support and Waterborne Freight Grant and provide clear guidance in the National Planning Strategy and National Policy Statement on Ports on how a modal shift can be supported.</p>	Infrastructure
<p>Defra should revise its flood funding formula to more accurately consider the value of critical coastal assets.</p>	Infrastructure
<p>Move beyond a five-year planning model to allow more anticipative infrastructure investment, using planning periods most suited to the ports and freight and logistics sectors.</p>	Infrastructure
<p>Key freight and logistics infrastructure spending devolved to Transport for the North.</p>	Infrastructure
<p>Devolve the key functions and powers of Network Rail and Highways England to Transport for the North.</p>	Infrastructure

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