



Rail Delivery Group

The role and value of rail freight in the UK

April 2021

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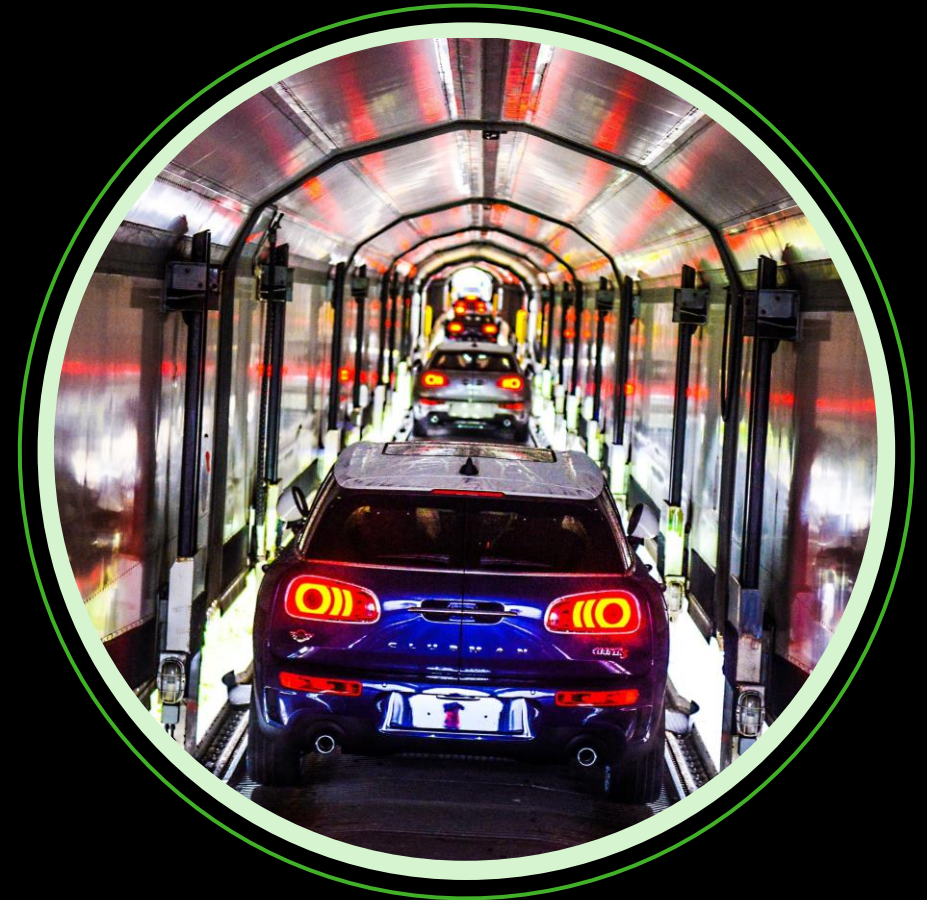
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01

Foreword



Foreword



Rail freight makes a major contribution to the UK economy, providing an **efficient, green, safe and reliable** way of moving goods and essential inputs around the country that also **alleviates congestion on the roads**. New research commissioned by the Rail Delivery Group (RDG) shows that **in 2018/19, rail freight contributed £2.45bn to the UK economy**, with benefits dispersed from the South of England through the industrial Heartland of the Midlands, Wales and North England up into the central belt of Scotland and beyond.

Rail freight’s role has become even more pivotal during the COVID-19 Pandemic and, going forward, could be enhanced further with the **industry poised to support the economic recovery from COVID-19, help the country reach net zero and assist in levelling up the UK economy**.



Roles for rail freight going forward

Decarbonisation and growth in sectors that facilitate modal shift could bolster efforts to **achieve net zero carbon by 2050**

Further growth will *'oil the wheels'* of the economy, allowing for delivery of key infrastructure and taking pressure off road and urban transport **to enable the UK to 'build back better'**

Rail freight’s established national network and ability to improve the efficiency of transporting goods to and from cities can be part of the engine to **'level up' the UK economy**

Capitalising on the opportunities rail freight offers requires action: the right decisions will need to be made to support growth and maximise rail freight’s economic contribution. These cover capacity allocation, journey time improvements, train lengthening, modal shift investments and investments in infrastructure.

This work makes a first step in moving the industry forward: providing a framework which allows for comparisons of benefits offered by different service types. This framework could be used to support key strategic decisions so that rail freight can fulfil its potential and play its part in supporting the UK in meeting the challenges of the coming years.

John Thomas

Director of Policy, Rail Delivery Group



Rail Freight Today – *efficient, green, safe and reliable*

02



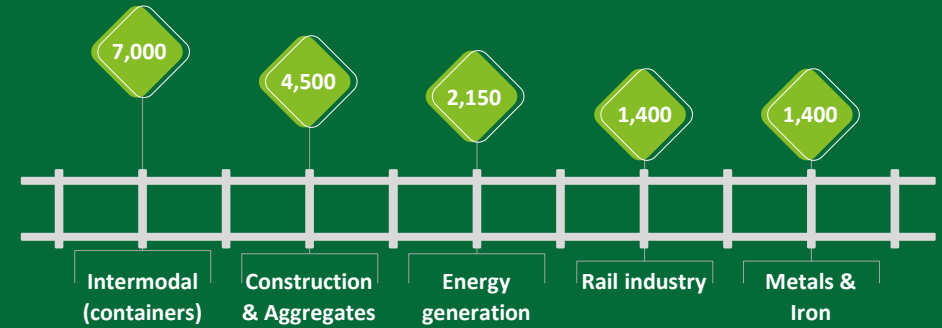
Introduction

- **Rail freight plays a major role in the UK economy**, each year carrying over £30bn in goods, including:¹
 - **Intermodal containers to and from key ports and between domestic logistics hubs.** These contain goods ranging from clothes to raw materials and groceries; and take 2.9 million lorry journeys off the road each year (nearly 8,000 on average each day), reducing emissions, congestion and noise, plus improving air quality.²
 - **Construction materials from quarries to regional distribution centres and building sites.** A single freight train is able to transport enough materials to build 30 houses and the industry has made developments such as the Shard, the A14 and Heathrow Terminal 5 possible.³
 - **Supporting the functioning of the wider rail industry.** Freight operating companies provide 5,000 train services to Network Rail annually to renew and enhance the rail network whilst supporting activities including track clearing and, the moving of empty rolling stock to keep passenger services moving.⁴
- **Rail freight’s role has become even more pivotal during the Covid-19 pandemic** ensuring timely delivery of essential goods, moving personal protective equipment around the country, and making use of extra rail capacity to meet increases in demand.
- **Going forward rail freight is likely to play an even bigger part in the UK economy with:**
 - **Key sectors including intermodal, construction, express goods and automotive projected to grow** with more businesses interested in using rail freight in their logistics chains along with other modes such as road and waterways.
 - **The UK’s withdrawal from the EU, meaning increased activity at UK ports with new trade arrangements** and the need to relieve road congestion while maintaining links to inland conurbations.
- However, **to play this bigger role will require changes to reflect the benefits of rail freight more holistically in decision-making.** An overview of a framework which allows for comparisons of benefits offered by different service types to inform decision-making is set out later in this report.

¹ RDG (2019) “Rail Freight: Delivering for Britain”, see here: https://www.raildeliverygroup.com/files/Publications/2019-05_rail_freight_delivering_for_britain.pdf
² Deloitte analysis of ORR data
³ RDG (2018) “Rail Freight: Working for Britain”, see here: https://www.raildeliverygroup.com/files/Publications/2018-06_rail_freight_working_for_britain.pdf
⁴ RDG (2019) “Rail Freight: Delivering for Britain”, see here: https://www.raildeliverygroup.com/files/Publications/2019-05_rail_freight_delivering_for_britain.pdf
⁵ Million tonne kilometres are a common measure of rail freight activity as they represent both the distance travelled by freight operators to transport goods as well as the number of goods transported.



Top five sectors by freight volume carried (2018/19 – MTkm⁵)



Source: Deloitte analysis, Network Rail, DfT



Value delivered by rail freight in key sectors



Taking on average nearly **8,000** lorry journeys off the road each day...



... with each train carrying materials to build **30 houses ...**



... and providing **5,000 train services** to Network Rail annually.



Rail freight contributes £2.45bn to the UK economy each year

- New analysis compiled by Deloitte estimates that rail freight contributes **£2.45bn to the UK economy each year**,¹ roughly three times industry revenues (£879m in 2018/19).²
- This consists of:
 - Over **£1.65bn in benefits enjoyed by customers of rail freight**.^{3,4}
 - Around **£800m in benefits to wider society**⁵ through removing 7m lorry journeys from the road network each year.⁶
- Specific types of benefits this includes are set out below.

Benefits to customers

The value of freight services to customers. Consisting of

- Costs Savings** ▶ Enabled by faster maximum speeds, timetabling and drivers changes.
- Time Savings** ▶ From direct routings and less traffic than alternatives for certain journeys.
- Reliability Benefits** ▶ From more certainty around average journey times for certain routes.

Social benefits

The value of freight services to wider society. Consisting of:

- Relief of Congestion** ▶ Through modal shift from road to rail.
- Environmental Benefits** ▶ Through reduced carbon emissions, improved air quality and reduced noise.
- Improved Safety** ▶ From reductions in the frequency and severity of safety incidents

¹ Deloitte (2021) "Assessing the Value of Rail Freight", A report for the Rail Delivery Group

² ORR data

³ Referred to as 'user benefits' in Deloitte (2021) "Assessing the Value of Rail Freight"

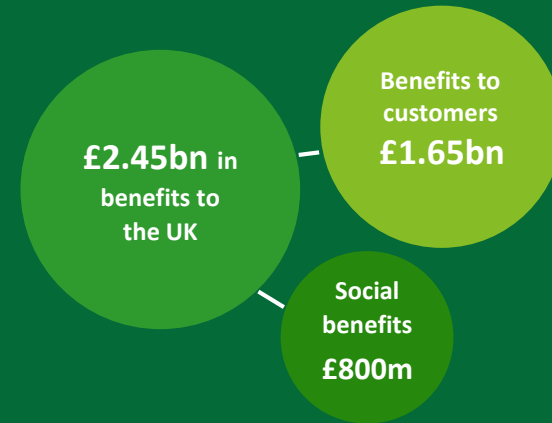
⁴ Deloitte (2021) "Assessing the Value of Rail Freight", A report for the Rail Delivery Group

⁵ IBID

⁶ ORR data



The economic contribution of rail freight (2018/19 volumes and prices)



Source: Deloitte (2021) "Assessing the Value of Rail Freight", A report for the Rail Delivery Group



Example customer views on the benefits of rail freight

“ Rail freight is key in reducing our environmental footprint and in enabling us to contribute to net zero – Tesco ”

“ Using road to access inner cities could as much as double our costs compared to rail – Aggregate Industries ”

“ Reliability of our supply chain is key for our business. Rail generally offers this – Drax ”

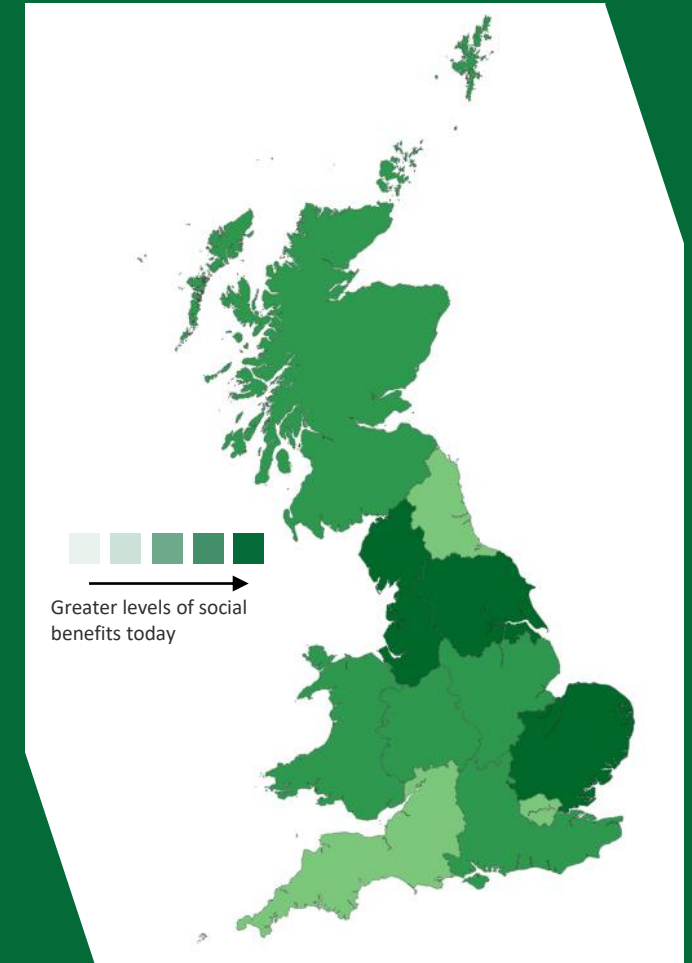


The industry supports economic activity up and down the country

- Rail freight supports businesses and communities up and down the UK through:
 - **Supporting key sectors which benefit UK plc** more broadly such as:
 - Power stations and industrial centres in Yorkshire and the Humber and North West England.
 - Logistics and manufacturing hubs in the Midlands and Wales.
 - Container traffic from Deep Sea Ports to and between inland domestic terminals across the length of the country, from the South of England to the Central Belt of Scotland.
 - **Delivering social benefits dispersed throughout the country**, including reduced congestion, emissions and noise (as shown in the map to the right).
- Analysis suggests that 90% of these benefits accrue to freight customers and wider society outside of London and the South East¹. National customer and social benefits (as set out above) have been apportioned based on freight activity levels across the UK with full results set out in the table below.



Dispersion of social benefits across the UK (2018/19 volumes)⁴



Regional economic and social benefits across the UK²

Region	Total benefits (£m, 2018/19)	% share (of total)	Customer benefits (£m, 2018/19)	Social benefits (£m, 2018/19)
Yorkshire and The Humber ³	860	35%	735	125
East Midlands (England)	375	15%	300	75
Wales	260	11%	200	60
North West (England)	225	9%	125	100
East of England	190	8%	45	145
South East (England)	120	5%	45	75
Scotland	105	4%	45	60
North East (England)	100	4%	65	35
West Midlands (England)	95	4%	35	60
London	75	3%	35	40
South West (England)	45	2%	10	35

Source: Deloitte (2021) "Assessing the Value of Rail Freight", A report for the Rail Delivery Group

¹Deloitte (2021) "Assessing the Value of Rail Freight", A report for the Rail Delivery Group

²Rounded to the nearest £5m.

³The majority of benefit in this region are accounted for by benefits from energy generation attributed by power plant location. In reality the benefits of energy generation are distributed across the UK among onward consumers of power. Further detail can be found in: Deloitte (2021) "Assessing the Value of Rail Freight", A report for the Rail Delivery Group

⁴Regions set out in the map are aligned to NUTS1 regions of the UK that rail freight serves.



Rail freight also supports urban development and more efficient supply chains



Rail freight facilitates better urban development

- **Rail freight facilitates a better logistics system for urban needs.** Network Rail data shows that rail freight carries important flows of construction materials into and out of major cities each day, supporting some of the country’s most strategically important projects. In London alone, these flows also take over 1,000 lorry journeys off the road each working day:¹
 - **Reducing congestion** in some of the most congested roads in the country.
 - **Delivering £27.9m in social benefits each year** through reduced emissions, noise, infrastructure wear and better safety outcomes.²
- These **benefits are likely to be larger than existing research suggests** as it does not recognise added benefits from transporting crucial materials into and out of urban areas and through congestion relief in areas that are already heavily congested.³



It also supports better supply chain efficiency and regional development objectives

- Rail freight, working with other modes, allows for **more efficient and integrated supply chains:** facilitating the establishment of logistics hubs supporting regional economic development. These hubs allow the wider supply chain to locate close to rail freight links which could **improve productivity** through several channels.
- **Domestic hubs like Doncaster iPort and East Midlands Gateway** provide some evidence of this clustering of activity. Firms at these locations include:⁴
 - Companies with logistics arms such as **Maritime, DHL, IKEA and Amazon.**
 - Manufacturers like **Nestle and Fellowes.**

¹ Deloitte analysis of Network Rail, ORR and DfT data

² Deloitte analysis of Network Rail, ORR and DfT data

³ Deloitte (2021) "Assessing the Value of Rail Freight", A report for the Rail Delivery Group

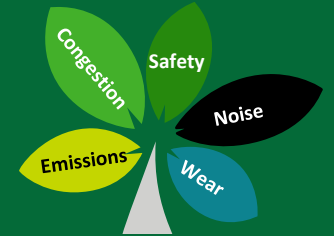
⁴ IBID



Impact of construction and aggregates rail freight in major cities

Rail freight services are estimated to take **1,000** lorry journeys off the road in London each working day...

... leading to improved social outcomes



Source: Deloitte Analysis, Network Rail, ORR, DfT data



Potential productivity benefits of rail freight hubs



Matching

Ability to find suitable suppliers and workforce more quickly



Sharing

Ability to share inputs, supply chains and infrastructure (e.g. rail terminals)



Learning

Ability to share knowledge and ideas



Rail Freight Tomorrow – *a key enabler for lower carbon and economic growth throughout the UK*

03



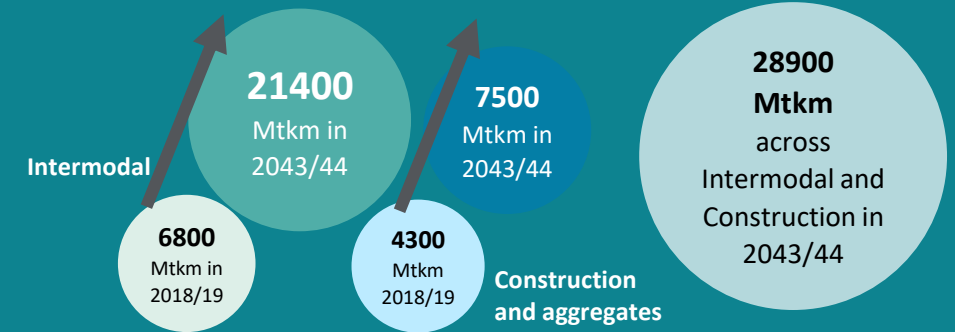
Decarbonisation and growth in rail freight will bolster efforts to meet net zero

- **Rail freight already offers significant environmental benefit to the UK economy.** It is estimated to:
 - **Prevent 7m lorry journeys per year.**¹
 - Reduce emissions on average by 76% when compared to road transport² equating to **around 1.4m tonnes of CO2 emissions saved each year.**³
- **Continued modal shift to rail will reduce carbon emissions further,** a process which can be supported by creating faster, more efficient freight paths. Changes in fuel usage and the pricing of carbon will also serve to expand rail’s environmental benefits going forward. For instance:
 - Network Rail’s Traction Decarbonisation Network Strategy (TDNS) describes how **the industry could move to near zero carbon to support net zero by 2050.**⁴
 - **Anticipated growth in sectors which have the greatest ability to transfer goods from road to rail,** such as intermodal (particularly domestic) and construction and aggregates.⁵
 - **Increases in the level of ‘carbon prices’** used to value emissions saved would also increase the monetised value of environmental benefits.⁶
- As an example, using the same approach employed to estimate social benefits of rail freight to the UK today and assuming decarbonisation reduces rail emissions by 90% as well as volume growth in intermodal and construction sectors is realised, rail freight could deliver **additional environmental benefits of between £0.4 - £0.6bn by 2043/44** – increasing emission savings by over double compared to today.⁷

¹ Deloitte analysis
² RDG (2019) “Rail Freight: Delivering for Britain”, see here: https://www.raildeliverygroup.com/files/Publications/2019-05_rail_freight_delivering_for_britain.pdf
³ Deloitte analysis
⁴ Network Rail, 2020. [Traction Decarbonisation Network Strategy: Interim Programme Business Case.](#)
⁵ Forecasts taken from Scenario E (central case/do-minimum) in Network Rail, 2020. [Rail Freight Forecasts: Scenarios for 2033/34 & 2043/44](#)
⁶ Central estimates of social impacts are based on a ‘core’ carbon price utilised in the public sector. Research suggests that carbon prices are currently suppressed, on an upward price trend, and could be several times larger in reality. Use of such larger carbon prices would also serve to increase the value of environmental benefits going forward
⁷ For more information on how these figures have been estimated please see: Deloitte (2021) “Assessing the Value of Rail Freight”, A report for the Rail Delivery Group
⁸ Million tonne kilometres are a common measure of rail freight activity as they represent both the distance travelled by freight operators to transport goods as well as the number of goods transported.



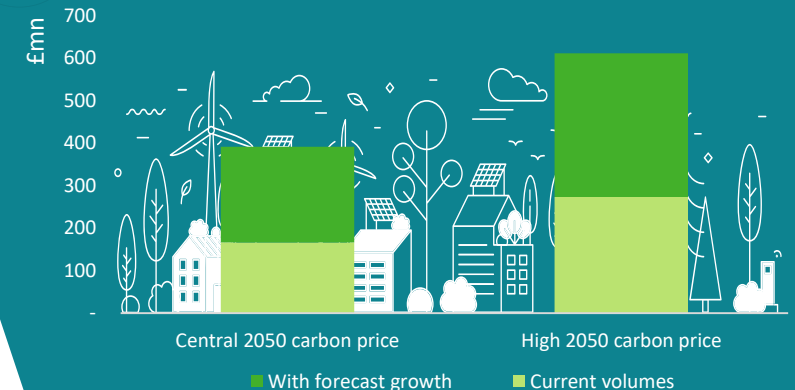
Intermodal and Construction and aggregates are projected to grow significantly towards 2043/44...⁸



Source: Network Rail



... which could increase environmental benefits to 6-10 times the current level






Source: Deloitte (2021) “Assessing the Value of Rail Freight”, A report for the Rail Delivery Group



Freight can support ‘building back better’ from COVID-19 and ‘levelling up’ the UK economy






Rail freight can form a key part of the engine to ‘build back better’

- The UK Government plans to ‘**build back better**’ following COVID-19, spending over £600bn on infrastructure over the next five years.¹
- **Rail freight has an important role to play in the Government’s plans** through:
 -  **‘Oiling the wheels’ of the economy** and enabling the efficient delivery of materials to build and power new infrastructure.
 -  **Relieving pressure on the strategic road network**, allowing other flows of people and freight on roads to travel more freely.
 -  **Delivering key infrastructure** like HS2, Hinkley Point and Sizewell Power Stations.



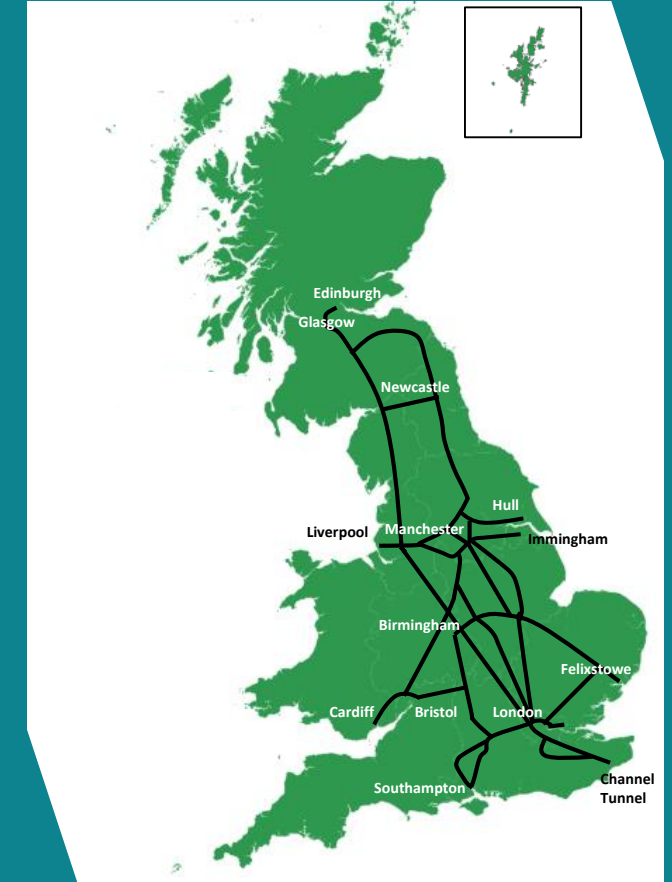
It also can unlock further ‘levelling up’ of the UK economy

- The UK Government has also committed to ‘**levelling up’ the UK economy**, “*raising productivity and growth in all nations and regions*”.²
- **Rail freight can help make this change happen** through its:
 -  **Extensive national network** which can connect businesses to their customers across the country to ports, distribution hubs, quarries and other strategically important locations.
 -  **Ability to deliver goods more cheaply and in a reliable way**, particular over long distances, into dense areas or when carrying large volumes.
 -  **Propensity to support key growth industries** outside the South East of England such as construction and aggregate materials, energy and manufacturing.³

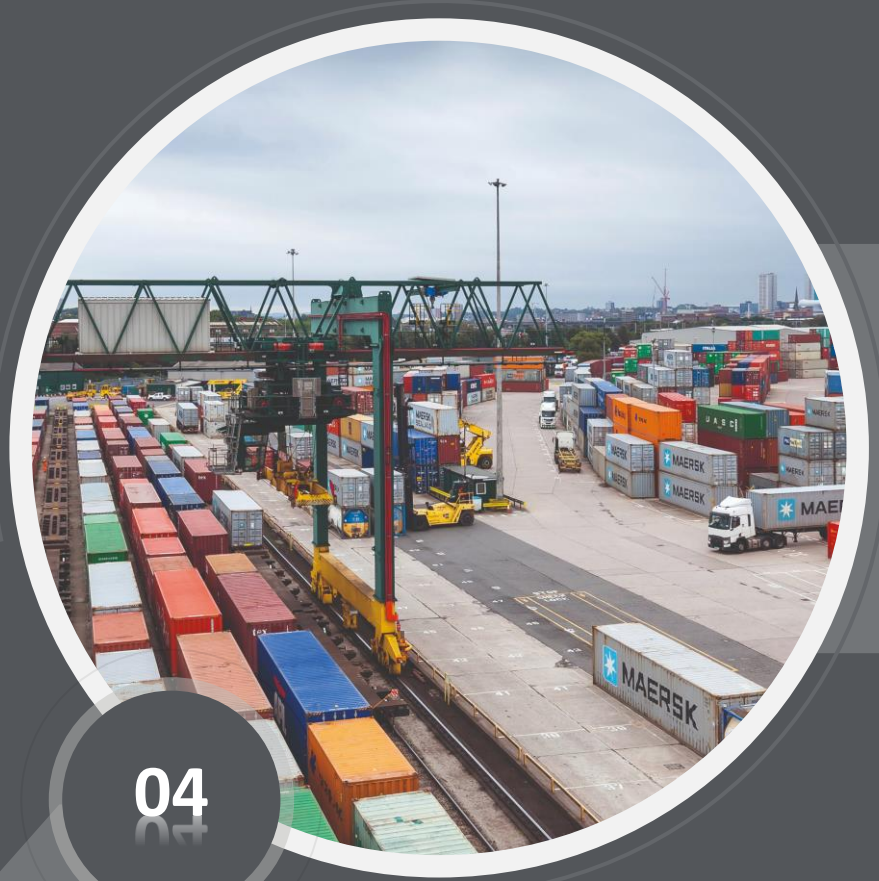
¹ UK Government (2021) “Build Back Better: Our Plan For Growth”, see here: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/966847/Plan_for_Growth_Book_Web_accessible.pdf
² UK Government (2020) “Policy paper – budget 2020”, see here: <https://www.gov.uk/government/publications/budget-2020-documents/budget-2020>
³ SQW/Cambridge Econometrics (2016) “The Northern Powerhouse Independent Economic Review: Final Executive Summary Report”, see here: <https://www.transportforthenorth.com/wp-content/uploads/Northern-Powerhouse-Independent-Economic-Review-Executive-Summary.pdf>



Key UK rail freight corridors⁴



Source: Network Rail
⁴ For more information on key UK rail freight corridors and commodity types, please see: https://www.networkrail.co.uk/wp-content/uploads/2021/03/Freight-UK-Base-Map-Rail-Freight-Commodities_Final-v1.0_PDF.pdf



Making Tomorrow Happen – *next steps for the rail freight industry*

04



For rail freight to achieve its future potential it requires action now

- This report has set out the key role rail freight plays in the UK economy today. However, **for rail freight to fully support Net Zero, Build Back Better and Levelling Up, further support is needed:**

Infrastructure investment. Network Rail's TDNS sets out a road-map for electrification of the freight network to support significant reductions in carbon emissions. But to deliver this, there is a need for investment to deliver required infrastructure changes and to stimulate private sector interest in new electric locomotives and rail freight facilities.

Support for modal shift. Reductions in carbon emissions could be achieved by facilitating growth in existing flows, such as intermodal and construction carriage, as well as new flows such as parcels and light logistics. These, compared to other types of goods, have a greater propensity to achieve reductions in carbon from modal shift.

Optimisation of existing capacity. This is needed to enable greater availability of freight paths at new and different times and to enable faster and more non-stop running by reducing the need for looping of freight trains. This would help expand volumes carried and sectors served (including bringing new customers to the industry). Further improvements to support train lengthening will also allow for greater amounts of materials to be carried.

- Forthcoming reforms following the **Williams Review could provide the basis for important steps forward** in each of these areas as the industry looks to emphasise benefits-led assessments when making key decisions.
- However, **enabling such decision-making and promoting further sector growth will need a fuller appreciation of the benefits of rail freight** and an understanding of how to compare these benefits to those offered by other services.

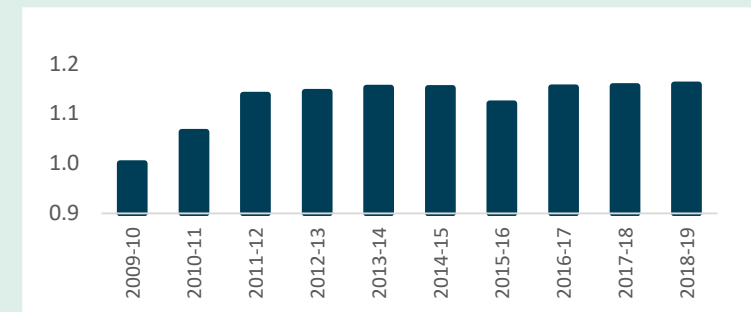


Focus on train lengthening

Rail freight has increased the amount of goods transported on services over time, but gains are diminishing with existing allocated capacity. To continue such a trend requires greater path availability to make best use of network capacity with even longer trains.



Weight and length of freight carried per train (Tkm, 2009/10 = 1)



Source: Deloitte analysis, ORR data



An initial framework has been developed to help decision-makers and prospective customers make this happen

- To support further growth going forward, decision-making across the following areas will be important:
 - Investment decisions.
 - Capacity allocation.
 - Improving freight journey times.
 - Modal shift.
 - Train lengthening.
- New work on the benefits of rail freight outlines a framework to support decision-making on a number of these areas by allowing for the comparison of benefits offered by different services.¹ This **provides decision-makers with tools to identify where future growth opportunities** to support key policy aims may lie. It also gives **prospective customers the means to illustrate the benefits they could create.**
- Using this framework, along with Network Rail and rail freight operator assumptions, benefits from different services each year for three case studies have been estimated. These show that relative benefits offered by freight and passenger services depend upon the specification of services and whether they operate in the peak and/or off-peak. Case studies analysed include where:²
 - There is a replacement of an off-peak passenger service with a freight service carrying intermodal containers on a semi-rural route .
 - There is a replacement of a passenger service with a freight service carrying construction materials into a dense urban area, both in the peak and off-peak.
 - A longer freight train is utilised as opposed to a standard-length train, both of which displace a passenger service in the off-peak on a semi-rural route.
- This work could be built on by UK Government, Network Rail, ORR and the wider rail freight industry going forward and **through a fuller appreciation of the benefits of rail freight, allow the sector to reach its future potential.**

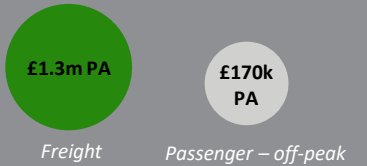
¹ For further details on the framework for decision-making please see Deloitte (2021) "Assessing the Value of Rail Freight", A report for the Rail Delivery Group
² Benefits estimated shown in this report are determined by inputs and assumptions provided by Network Rail and rail freight operators applied to outcomes of new analysis on the benefits of rail freight and values set out within the DfT's TAG. Were alternative inputs and assumptions utilised, or different cases to be analysed, results would be subject to change. For further detail on the inputs and assumptions underpinning the case studies please see: Deloitte (2021) "Assessing the Value of Rail Freight", A report for the Rail Delivery Group
³ Annual estimated benefits of an off-peak passenger service in this case study, under assumptions set out in Deloitte (2021) "Assessing the Value of Rail Freight", A report for the Rail Delivery Group, are relatively low compared to other figures as the assumed frequency of off-peak passenger services that would remain is higher than under other case studies,



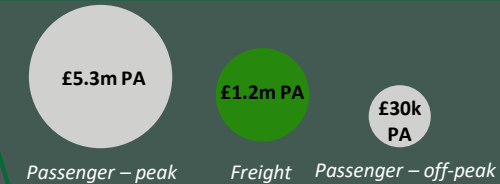
Examples of decisions that new work on rail freight benefits can support (2018/19 prices)

Benefits of an off-peak passenger service & intermodal freight service

There may be a case for replacing some semi-rural off-peak passenger services on certain routes with intermodal freight trains



Benefits of construction freight & peak and off-peak urban passenger services³



Replacing a passenger service going into a dense area with a construction and aggregates train may only be preferable in the off-peak

Benefits of an off-peak passenger service & different intermodal services

Longer trains offer benefits over and above standard services when considering displacement of semi-rural off-peak passenger services on certain routes



Source: Deloitte (2021) "Assessing the Value of Rail Freight", A report for the Rail Delivery Group



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