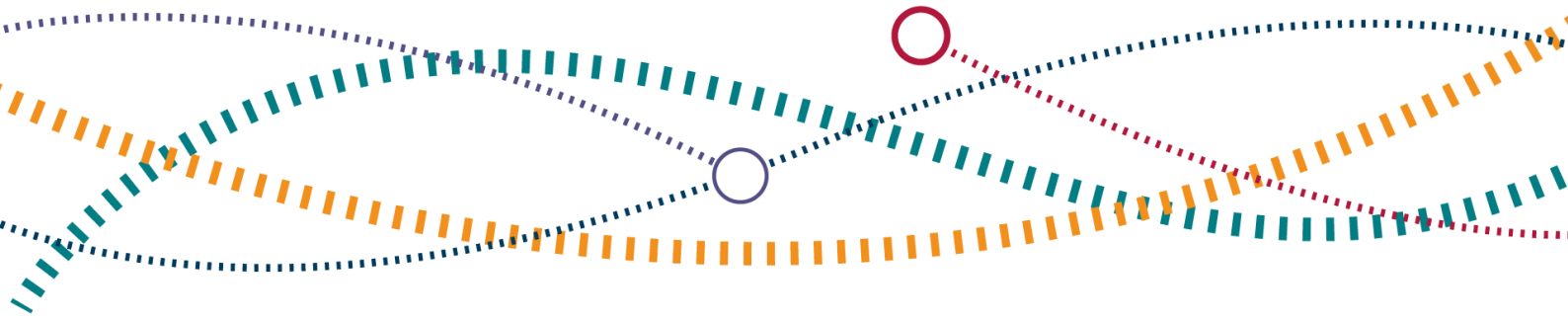
OFFICE OF RAIL AND ROAD

Report on rail industry productivity

18 March 2025



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Executive Summary

Efficiency gains combined with the recovery of train and passenger numbers are central to rail industry productivity and will be a vital part in the recovery of the finances of the industry. The operational costs of the railway have largely stabilised in the last two years, following a steadily upwards trend prior to the pandemic. The level of government funding for the operational railway has also stabilised recently, but as a share of income is at 49%, well over pre-pandemic levels.

Productivity is the ratio between the amount of goods and services produced (outputs) and the resources used (inputs). Productivity increases when more (or higher quality) output is delivered with the same or fewer resources.

This is our second year of reporting on rail industry productivity, following the discussion paper we published in April 2024. Since last year's discussion paper, we have further developed our analysis, focussing on more labour-based measures of productivity and developing more granular measures of train operator and infrastructure productivity. We have also included a new measure of productivity in this report based on the Office for National Statistics (ONS) Gross Value Added data.

Key findings

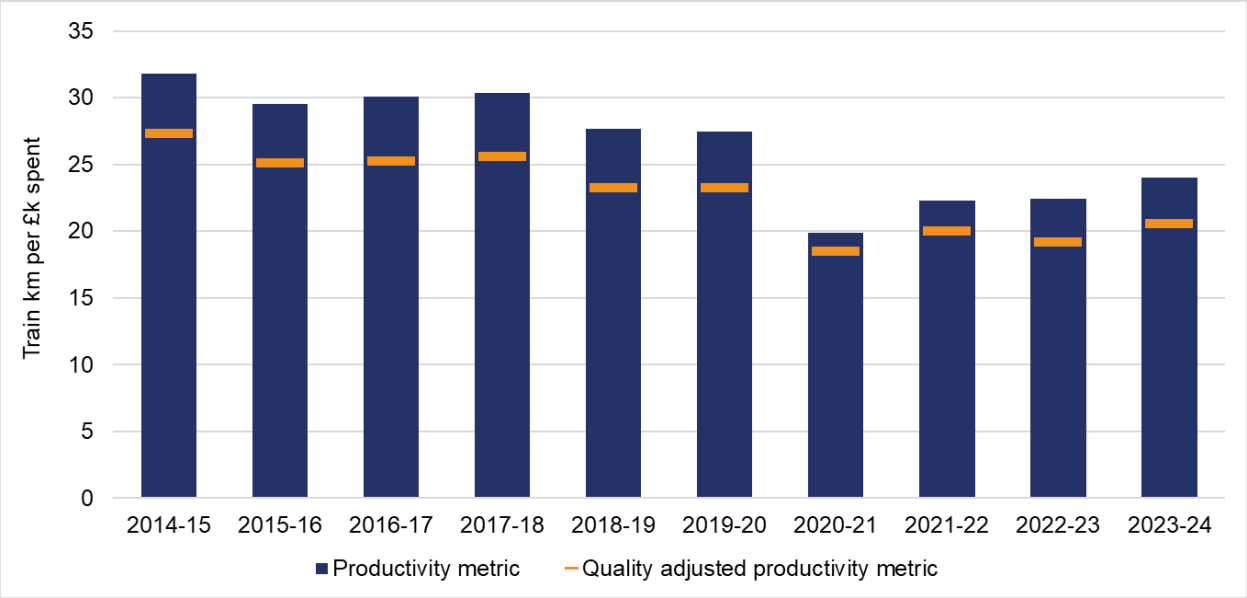
Rail industry productivity has recently improved as more trains are run and costs reduce

The rail industry's productivity, as measured by passenger and freight train kilometres per thousand pounds of industry expenditure, has shown a 7% year-on-year improvement in 2023-24, as train distance travelled continues to increase and previously rising costs have largely stabilised.

Rail industry expenditure has declined slightly from 2021-22 and this, alongside a recovery in train distance travelled, has led to some improvements in productivity. However, productivity remains at only 87% of 2019-20 (pre-pandemic) levels. Headline productivity is also adjusted for the punctuality of passenger and freight services. Punctuality is consistently a major factor in passenger surveys on the user experience and, other things equal, a decline in punctuality will adversely affect the quality of output and hence productivity. Despite our headline metric showing a 21% recovery in productivity since 2020-21, our quality adjusted metric shows a somewhat lower improvement since the pandemic of 11%. There has been a decline in train performance in recent years,

predominantly due to industrial action, severe weather and network reliability, resulting in a lower quality of service provided to passengers.

Figure 1 Total passenger and freight train kilometres per thousand pounds of industry expenditure, annual data from 2014-15 to 2023-24 (in 2023-24 prices)



Despite recent improvements, rail industry productivity remains below the level seen nearly a decade ago

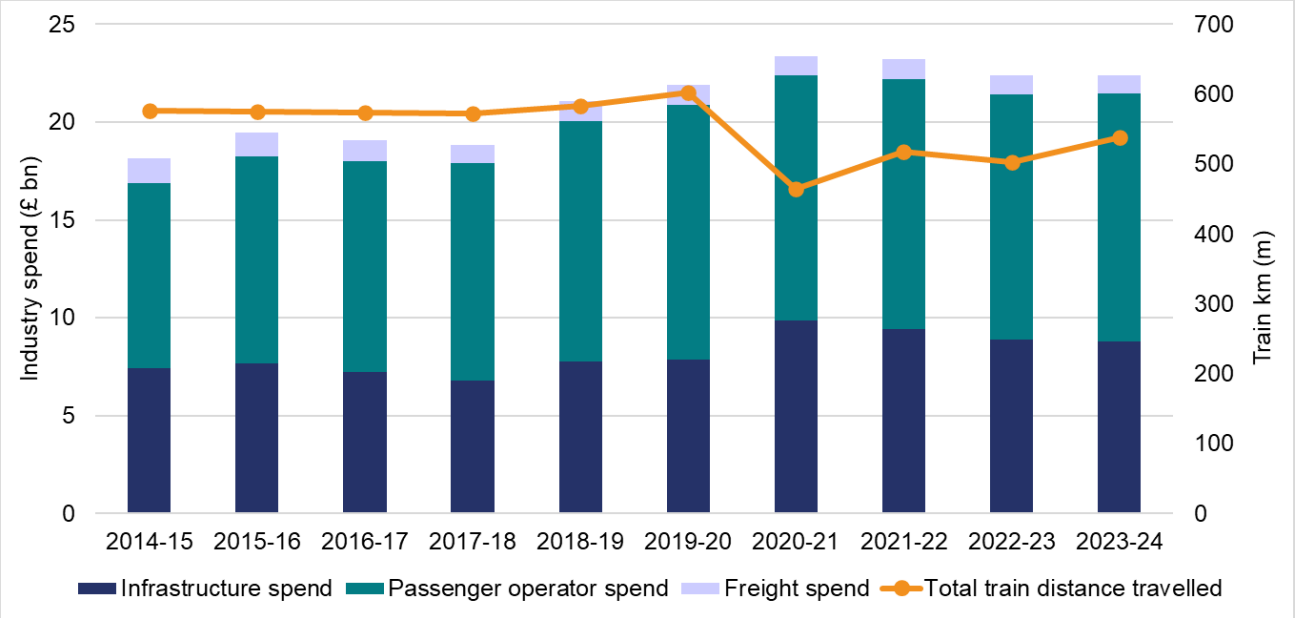
Rail industry productivity is 25% lower than in 2014-15. This was initially caused by increases in rail industry expenditure which outpaced increases in train distance travelled, leading to a slow decline in productivity. Not surprisingly, the sharp fall in train distance travelled during the COVID-19 pandemic ('the pandemic') substantially worsened the sector's productivity.

For Network Rail, a large part of the decline in productivity since 2014-15 was driven by steady increases in operating and maintenance costs. This was partly caused by a 15% increase in staff numbers from 2014-15 to 2023-24 following two restructuring exercises, although staff numbers have reduced more recently from the peak in 2020-21. The impact of high inflation and costs incurred to help manage the impact of the pandemic on Network Rail's operations (for example ensuring social distancing on worksites) have also contributed in recent years.

Rolling stock costs were the most significant contributor to the decline in productivity of train operating companies, with cost increases of 89% since 2014-15. This was in large

part because of increases in the cost of vehicles but also reflected a higher number of vehicles on the network and newer, more modern trains being leased.

Figure 2 Rail industry expenditure (in 2023-24 prices) and total train kilometres, annual data from 2014-15 to 2023-24

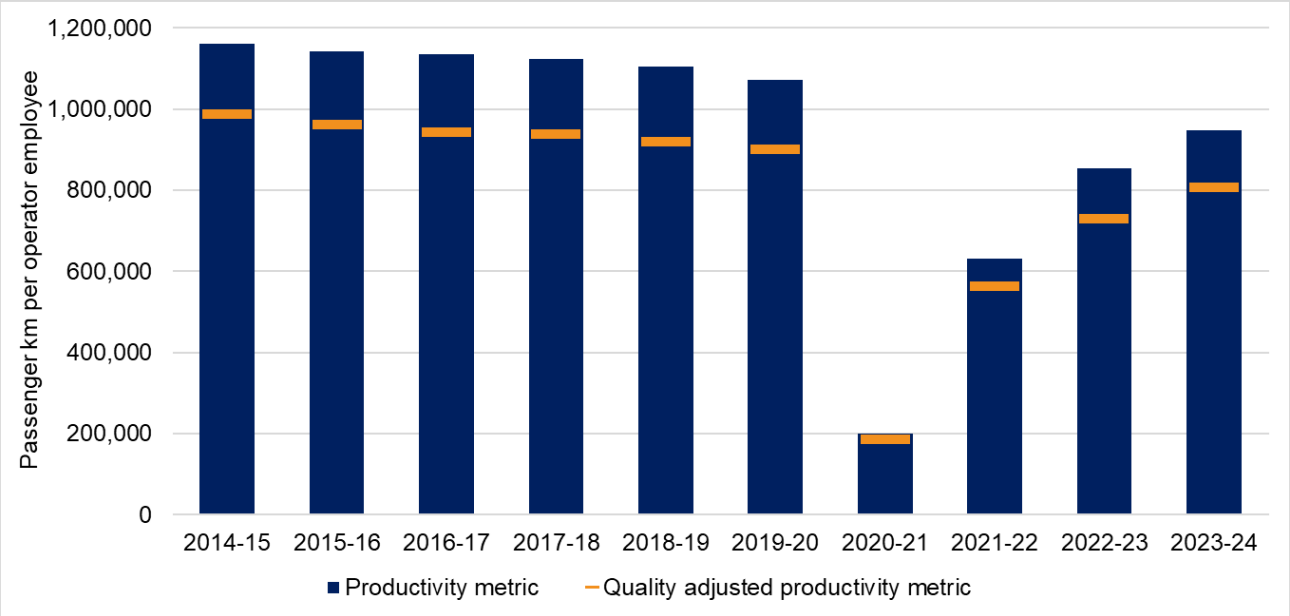


There was a sharp decline in total train kilometres in 2020-21 due to the pandemic. Train kilometres increased following the pandemic and by 2023-24 had returned to 89% of the distance travelled in 2019-20. However, productivity has been slower to recover as expenditure has not reduced significantly. Industry expenditure has limited flexibility to respond to changing circumstances in the near term because of the significant fixed costs in the railway, both for Network Rail which manages assets with a long lifespan and for train operators which will have long leases on key assets like rolling stock.

Post-pandemic travel patterns continue to adversely affect train operator and Network Rail productivity

Passenger rail productivity, measured by passenger kilometres per train operating company employee, has seen a long term decline due to rising staff numbers. There has been an increase of 17% in staff numbers across train operators, from 54,000 in 2014-15 to 63,000 in 2023-24. The reduction in productivity was then compounded by the decline in passengers travelling during the pandemic and the recovery since then is not yet back to pre-pandemic levels. Overall, train operator productivity remains down 18% on 2014-15 levels. This is shown in Figure 3.

Figure 3 Passenger kilometres per passenger train operating company employee, annual data from 2014-15 to 2023-24

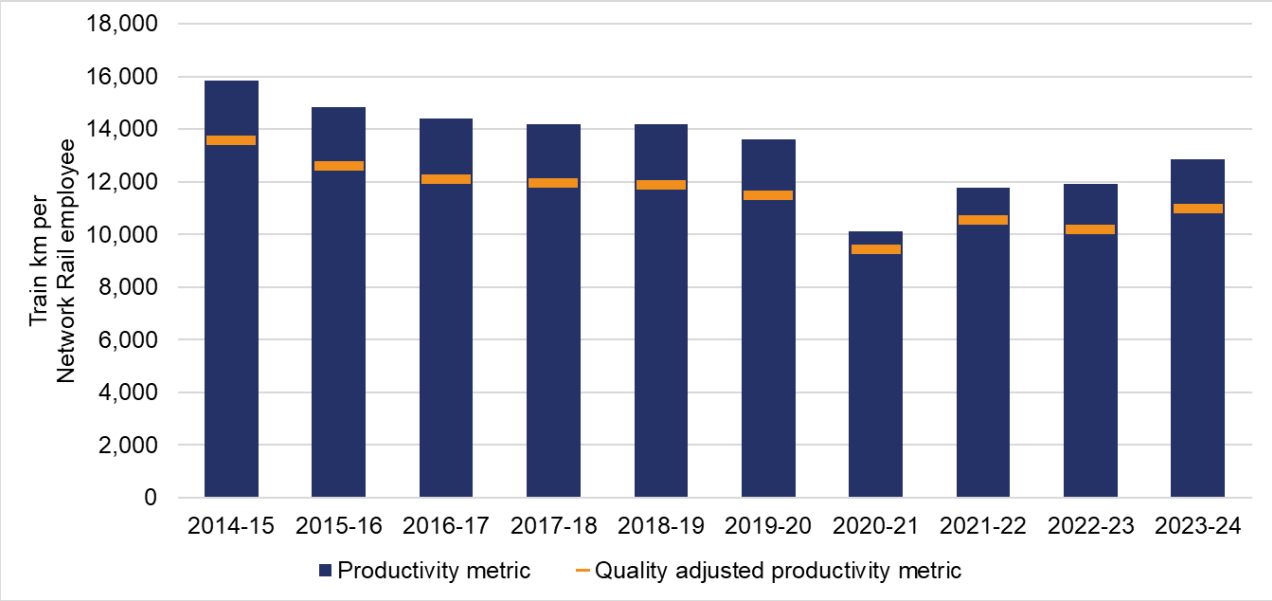


Network Rail's productivity, as measured by total train kilometres per Network Rail employee, has also been consistent with the trends of the wider rail industry in recent years: it showed generally declining productivity from 2014-15, with a significant drop (28%) between 2019-20 and 2020-21 due to the pandemic.

The drop in train kilometres was less significant than passenger kilometres due to governments' requirements on the industry to maintain minimum service levels during national lockdowns, despite few passengers travelling.

Overall, Network Rail's productivity per employee remains down 19% on 2014-15 levels. This is shown in Figure 4.

Figure 4 Train kilometres per Network Rail employee, annual data from 2014-15 to 2023-24



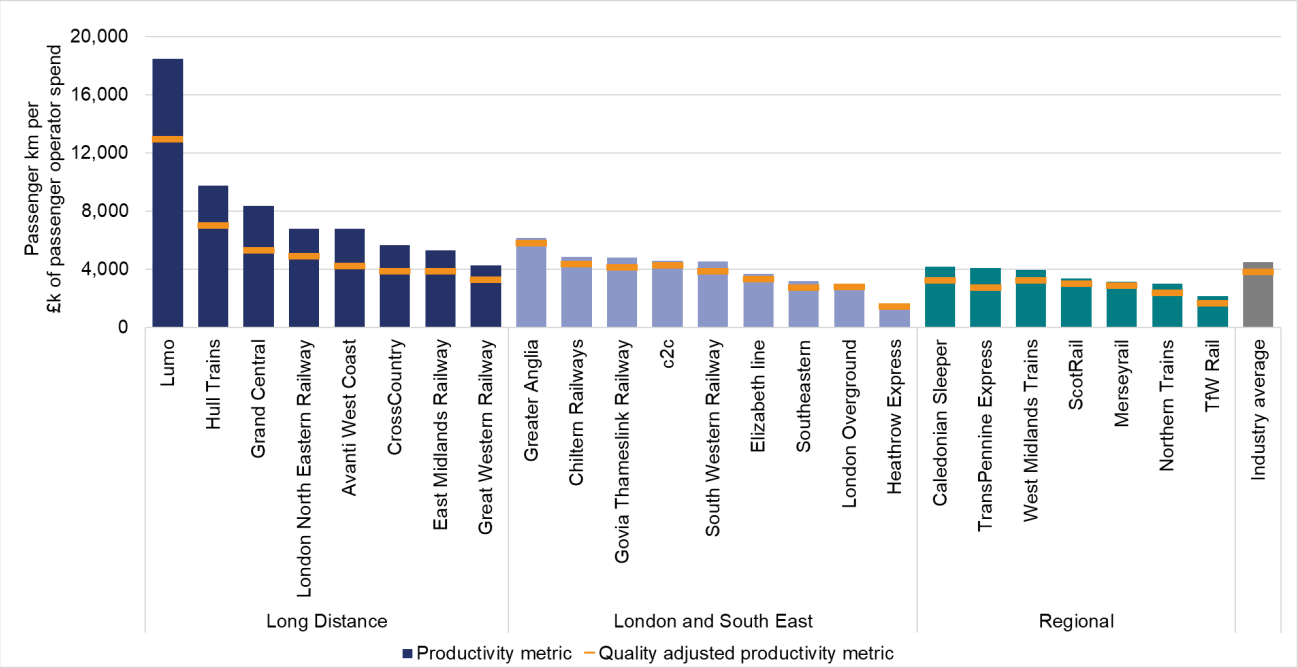
The declining trend in Network Rail's productivity prior to the pandemic was driven by staff numbers increasing faster (up 21% between 2014-15 and 2019-20) than the rise in train distance travelled on the network (which increased by 4% between 2014-15 and 2019-20). This included increases due to insourcing part of its maintenance and renewals function in Control Period 5 (April 2014 to March 2019) and undertaking an internal reorganisation as part of its Putting Passengers First initiative in Control Period 6 (April 2019 to March 2024). Nevertheless, this measure of Network Rail productivity has seen recovery in recent years as employee numbers have fallen and train kilometres has increased.

Productivity varies significantly across train operating companies

Productivity of individual train operators, measured by passenger kilometres per thousand pounds of operator expenditure, varies significantly. Using this measure, long distance operators are more productive than other operators and open access long distance operators (Lumo, Grand Central, Hull Trains) appear the most productive.

We recognise that this productivity metric can skew in favour of long distance operators as the distance travelled by each passenger is higher than it would be for a regional operator with a lot of urban stops, so the same number of train crew can support more passenger kilometres. There is a further potential benefit for open access operators, which have greater commercial freedom compared with franchised operators that need to comply with government-set obligations, such as the frequency of services, routes operated and, in some cases, the staffing of stations.

Figure 5 Passenger kilometres per thousand pounds of passenger operator expenditure, by operator, 2023-24

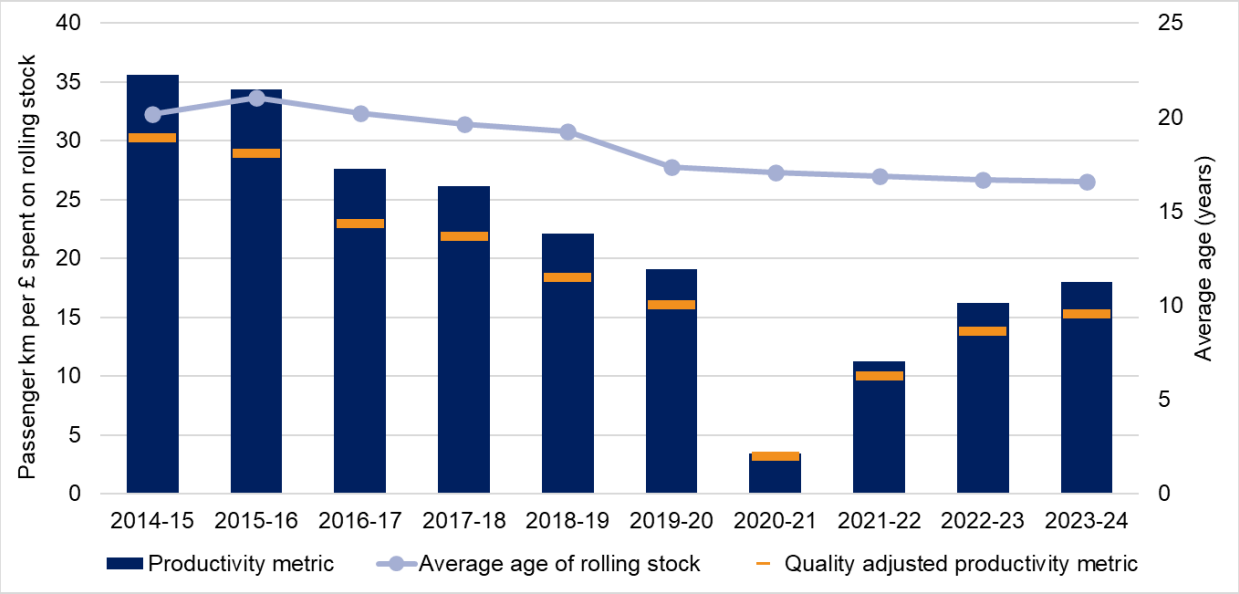


Rolling stock productivity has fallen

Rolling stock productivity, measured by passenger kilometres per pound of passenger rolling stock expenditure, has reduced by 49% since 2014-15, due to an 89% increase in rolling stock costs and a 4% decrease in passenger kilometres over the same period. With quality adjustments for punctuality (using on time to three minutes, also known as 'Time to 3', as the basis), productivity has also fallen by 49% since 2014-15, which is consistent with our unadjusted productivity measure.

Rolling stock leasing and maintenance costs currently make up 27% of passenger train operators' total costs and have increased significantly since 2014-15. The numbers of vehicles have also increased by 18% since 2014-15 and, although this increase was consistent with a rise in passenger numbers for several years, the number of vehicles has continued to rise since the pandemic. The newer vehicles have replaced ageing rolling stock, and the average age of rolling stock has reduced by 3.6 years over this time. This is likely to have contributed to the rise in costs and consequential drop in headline productivity, although it will also have helped to improve the customer experience and longer-term performance.

Figure 6 Passenger kilometres per pound of passenger rolling stock expenditure (in 2023-24 prices), annual data from 2014-15 to 2023-24



Passenger rolling stock utilisation, as measured by the average vehicle kilometres per vehicle, has decreased by 12% since 2014-15. While there has been a slight recovery since the pandemic, this would still suggest that rolling stock, which represents a significant area of expenditure for the industry, could be used more productively. Train operating companies are often committed to long-term rolling stock contracts, which can help to achieve value for money deals, however it also means operators cannot quickly adjust the level of rolling stock to reflect demand during events such as the pandemic or industrial action.

There are similar trends in the freight industry, where freight tonnes carried per train has decreased by 16% since 2014-15. A decline in the amount of coal carried in Great Britain in recent years has been a significant factor, as freight operators have as yet been unable to directly replace the routes that were dedicated to coal.

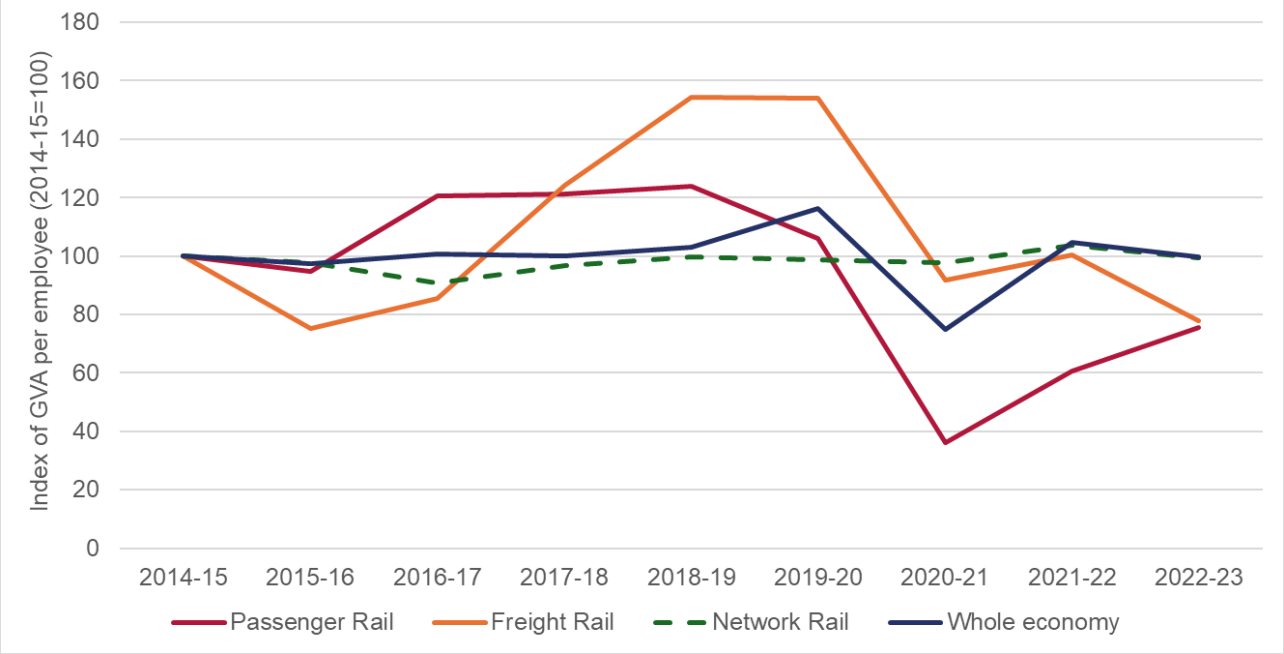
Passenger and freight operator productivity has lagged behind the wider economy

For this report we have also used Gross Value Added (GVA) of the rail industry per employee as an indicator of the productivity of the rail industry, i.e. how much value in monetary terms is added for each rail industry employee. GVA represents the difference between the value of output (what is produced) and the value of intermediate consumption (the cost of inputs and raw materials used to produce the output).

As seen in Figure 7 below, productivity for passenger train operators continues to recover from the impact of the pandemic in 2020-21, when significant drops in passenger numbers impacted on income and GVA per employee fell 66% year-on-year. Both passenger and freight GVA were significantly impacted by the pandemic, more so than the wider economy.

Network Rail GVA per employee has been consistently higher than other parts of the rail industry over the period (since 2014-15) and was less affected during the pandemic. This is because operators experienced significant declines in revenue during this period, whereas Network Rail's income was less affected, as the majority of its funding is from government grant or fixed track access charges, which are invariant to train usage.

Figure 7 Change in Gross Value Added per employee, annual data from 2014-15 to 2022-23 (in 2023-24 prices)



Note: Network Rail GVA was calculated using a different approach to the other three GVA measures and so is denoted as a dotted line. This is detailed further in our methodology in Annex C.

We will build on this analysis for future publications and welcome views on this report

We intend to undertake further research into the drivers of the rail industry's productivity and welcome comments on this year's report. For these and any other insights on rail sector productivity please email contact.pct@orr.gov.uk.

1. Introduction

1.1 This is our second year of reporting on the rail industry's productivity, following the discussion paper we published in April 2024. In this year's report we have expanded on the analysis in last year's discussion paper. This includes:

- adding quality adjustments to our key passenger and freight metrics, to adjust for the performance of the rail network;
- analysing the utilisation of rail vehicles at a more granular level;
- analysing the productivity of Network Rail's renewals delivery; and
- measuring rail industry productivity using a new metric based on the Gross Value Added (GVA) to the UK economy.

1.2 This report complements ORR's other whole industry reporting, such as our Rail Industry Finance (UK) publication, and analysis we undertake as part of holding Network Rail to account, for example we monitor trends in unit costs in our annual Cost benchmarking of Network Rail's maintenance and renewals expenditure report. We also publish the Annual Efficiency and Finance Assessment of Network Rail and the Annual Report on HS1.

1.3 Unless otherwise stated, data has been sourced from publicly available information such as ORR's rail finance publication, mentioned above, and our data portal. This is explained in more detail in our methodology in Annex C. We will continue to work with the industry to develop rail productivity metrics, including identifying the best data available for these metrics.

1.4 Chapter 2 compares headline productivity of the rail industry over time, considering the impact on this metric by different parts of the industry, such as train operators and rail infrastructure.

1.5 Chapter 3 includes separate analysis for train and freight operating companies, including a breakdown of productivity in the most recent financial year by train operating company. This chapter also considers the productivity of the rolling stock used on the network.

1.6 Chapter 4 analyses the productivity of Network Rail's infrastructure at a high level and also considers the productivity of its delivery of renewals works for some of its core assets.

1.7 Chapter 5 analyses GVA metrics for different parts of the rail industry.

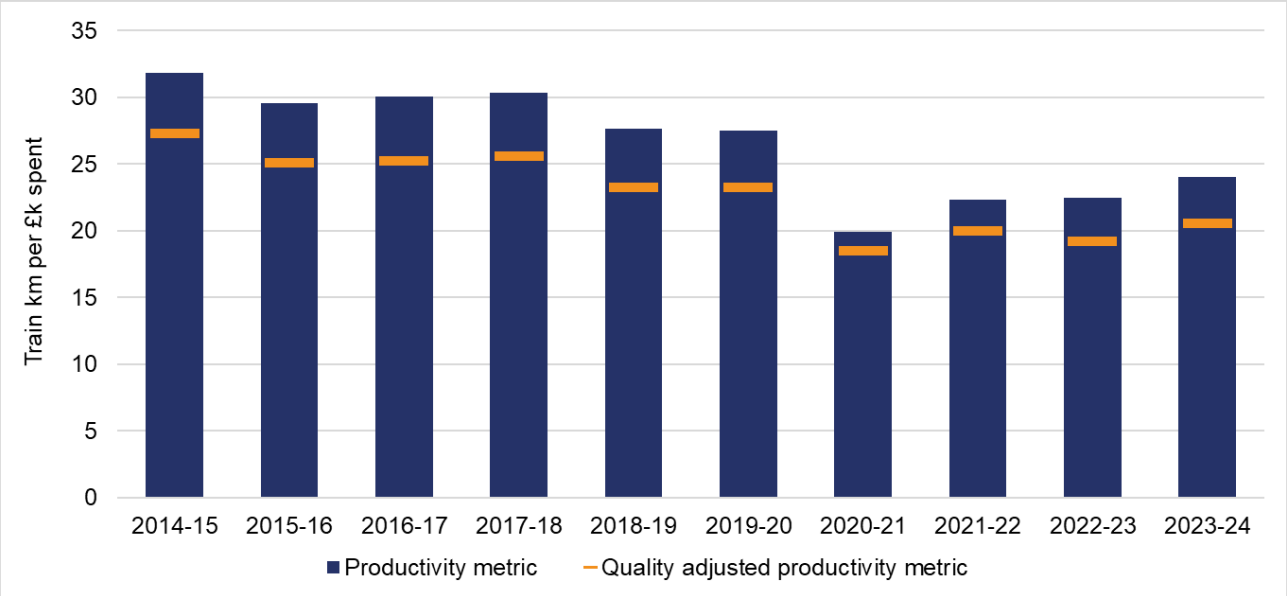
1.8 Annex A provides a summary of all metrics, Annex B compares the metrics by passenger operator, and Annex C outlines the methodology used in the report.

1.9 All expenditure has been stated in 2023-24 prices throughout this report, unless noted otherwise.

2. Industry wide metrics

2.1 The rail industry's productivity, as measured by passenger and freight train kilometres per thousand pounds of industry expenditure, has improved by 7% since last year, as train distance travelled continues to increase and previously rising costs have largely stabilised.

Figure 2.1 Total passenger and freight train kilometres per thousand pounds of industry expenditure, annual data from 2014-15 to 2023-24 (in 2023-24 prices)



2.2 However, in the longer term, productivity has declined 25% since 2014-15, as shown in Figure 2.1. This was initially caused by increases in rail industry expenditure which outpaced increases in train kilometres, leading to a slow decline in productivity. With quality adjustments for 'Time to 3', productivity has fallen by 25% since 2014-15, which is consistent with the unadjusted metric.

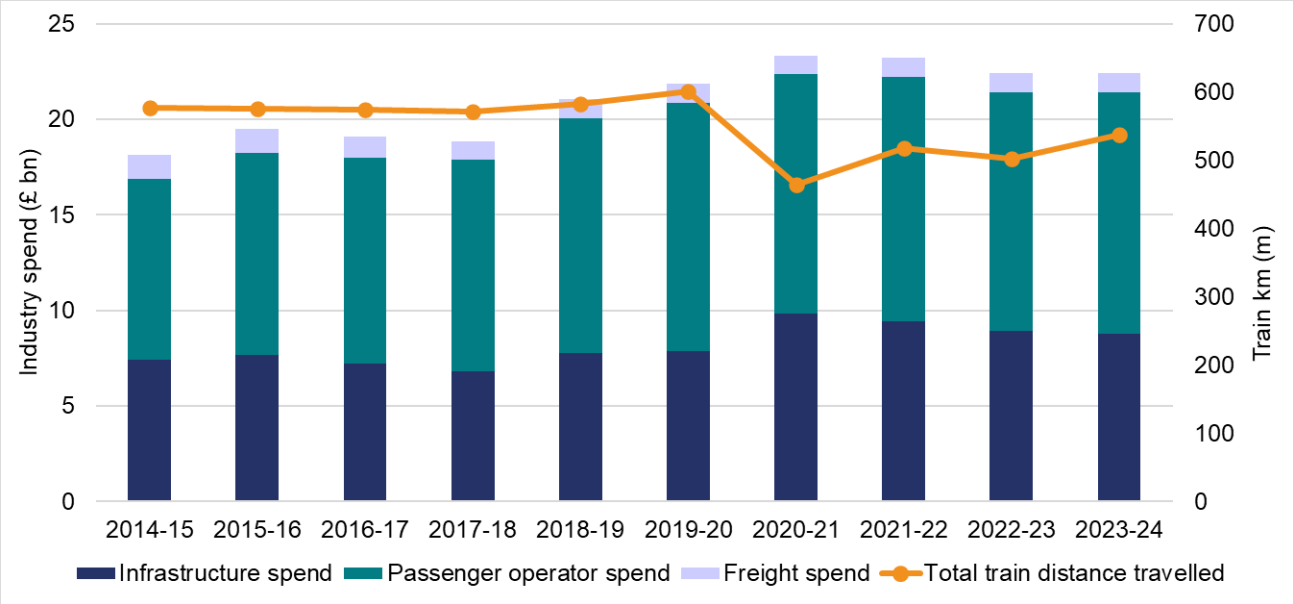
2.3 The pre-existing trend of declining productivity was exacerbated by the significant drop in train distance travelled during and following the COVID-19 pandemic ('the pandemic'). Since 2020-21, there has been an 21% improvement in productivity, but this remains at only 87% of 2019-20 (pre-pandemic) levels as train distance travelled has not reached pre-pandemic levels.

The output: train kilometres

2.4 As industry expenditure has largely stabilised in recent years, output measured on a train kilometres basis continues to be the main driver of changes in our measure of industry productivity.

2.5 Train kilometres were fairly stable prior to 2020-21, as shown in Figure 2.2 below, before falling significantly during the pandemic, from which it has not fully recovered. This initial drop in train kilometres was because of multiple national lockdowns during the pandemic. The pandemic had a continued impact in subsequent years, with reduced commuter traffic because of the increased trend of working from home.

Figure 2.2 Rail industry expenditure (in 2023-24 prices) and total train kilometres, annual data from 2014-15 to 2023-24



2.6 The recovery of passenger numbers (and consequently train kilometres) since the pandemic was impacted by industrial action in recent years which ran from June 2022 through to May 2024, with pay deals agreed with the UK Government in September 2024.

2.7 Whilst it is hard to separate the impact of industrial action in this period from the impact of other operational decisions such as planned timetable changes, the impact of industrial action on railway productivity is significant. According to analysis produced by GBRTT, direct industry passenger revenue forgone from national strike days totalled around £850 million in nominal prices between June 2022 and July 2024.

2.8 In the most recent year of our analysis, 2023-24, train kilometres have increased 7% year-on-year, and this is the main driver of a 7% improvement in our productivity metric, given that expenditure was broadly flat between those years.

The input: industry expenditure

2.9 Industry expenditure covers train operators, Network Rail and other parts of the industry, for example the Core Valley Lines network in South Wales.

2.10 Although the key driver to changes in our productivity metric is train kilometres, the productivity of the rail industry pre-pandemic was also affected by a 21% increase in industry expenditure from 2014-15 to 2019-20. Industry expenditure continued to increase during the pandemic, despite the significant drop in passenger numbers.

2.11 The rail industry has a high proportion of fixed costs, which means that costs are incurred regardless of passenger numbers. This is why industry costs did not reduce significantly in the pandemic. Network Rail and franchised train operators did not mitigate staff costs during the pandemic by putting staff on furlough, in part because of government requirements for minimum service levels to be maintained for essential travel purposes, and because rail staff were included in the definition of key workers.

2.12 Industry costs by 2023-24 were 24% higher than in 2014-15. In this time, Network Rail incurred steady increases in operating and maintenance costs. This was contributed to by a 15% increase in staff numbers from 2014-15 to 2023-24, which we discuss in more detail in Chapter 4, as well as costs incurred during the pandemic and to manage the impacts of industrial action.

2.13 For train operating companies, industry costs were 28% higher than in 2014-15. Rolling stock costs were the most significant contributor, with cost increases of 89% since 2014-15. We discuss these in more detail, and analyse the use of passenger rolling stock, in Chapter 3.

The quality adjusted metric

2.14 We have adjusted our productivity metric for the quality of the service delivered, with the quality adjusted level of productivity represented by horizontal red lines on the bars in Figure 2.1. We have used punctuality of services as a measure of quality as Transport Focus's February 2023 analysis of key drivers of passenger satisfaction noted that "punctuality/reliability is the most important driver of overall journey satisfaction, almost twice as important as any other aspect of the journey

experience". We explain these adjustments in more detail in our methodology annex (Annex C).

2.15 Despite our headline metric showing a 21% recovery in productivity since 2020-21, our quality adjusted metric shows a somewhat lower improvement since the pandemic of 11%.

2.16 The performance of passenger services remained broadly consistent in the pre-pandemic years (Time to 3 between 83% and 85%), but there was a sharp improvement in 2019-20, reflecting fewer services running on the network (leading to less congestion on the network) and fewer passengers using the trains.

2.17 As the network and trains have become busier the performance of services has reduced, and the quality adjusted measure of productivity is showing a much slower improvement in recent years than the unadjusted measure. The decline in train performance in recent years is predominantly due to industrial action, severe weather and network reliability.

2.18 Our quality adjusted measure reflects this decline in performance. The slower post-pandemic recovery of the quality adjusted measure shows that, although the quantity of services has increased, this is somewhat offset by a lower quality of service being provided to passengers.

3. Train operator metrics

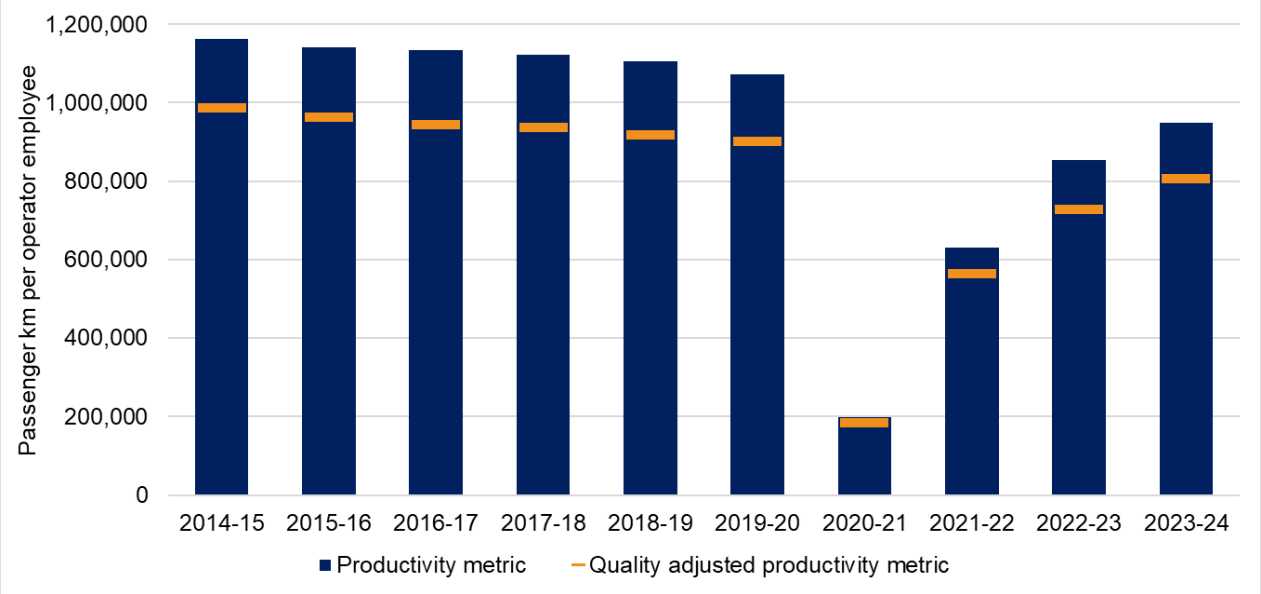
3.1 This chapter reports on the productivity of passenger and freight operators. We focus on labour and rolling stock productivity.

Passenger operator labour productivity

3.2 The productivity of passenger train operators, measured by passenger kilometres per train operator employee, has increased by 11% since 2022-23, but remains 18% lower than in 2014-15, as shown in Figure 3.1. This is driven by a 17% increase in train operator employees, while passenger kilometres have fallen by 4% since 2014-15.

3.3 With quality adjustments for 'on time to three minutes', productivity has fallen by 18% since 2014-15, which is consistent with the unadjusted metric.

Figure 3.1 Passenger kilometres per passenger train operator employee, annual data from 2014-15 to 2023-24



3.4 Passenger kilometres have fallen by 4% since 2014-15, with a significant fall during the pandemic. Since then, passenger kilometres (and consequently productivity) have begun to recover, although recovery has been restricted by the impact of industrial action and a post-pandemic shift toward remote working and reduced business travel.

3.5 Train operator employee numbers have increased by 17% from 54,000 to 63,000 since 2014-15, with the majority of this growth occurring prior to the pandemic. This has led to a 19% rise in passenger operator staff costs since 2014-15, with staff costs representing the largest component (33%) of passenger operator expenditure in 2023-24.

3.6 The increase in employee numbers can be attributed to:

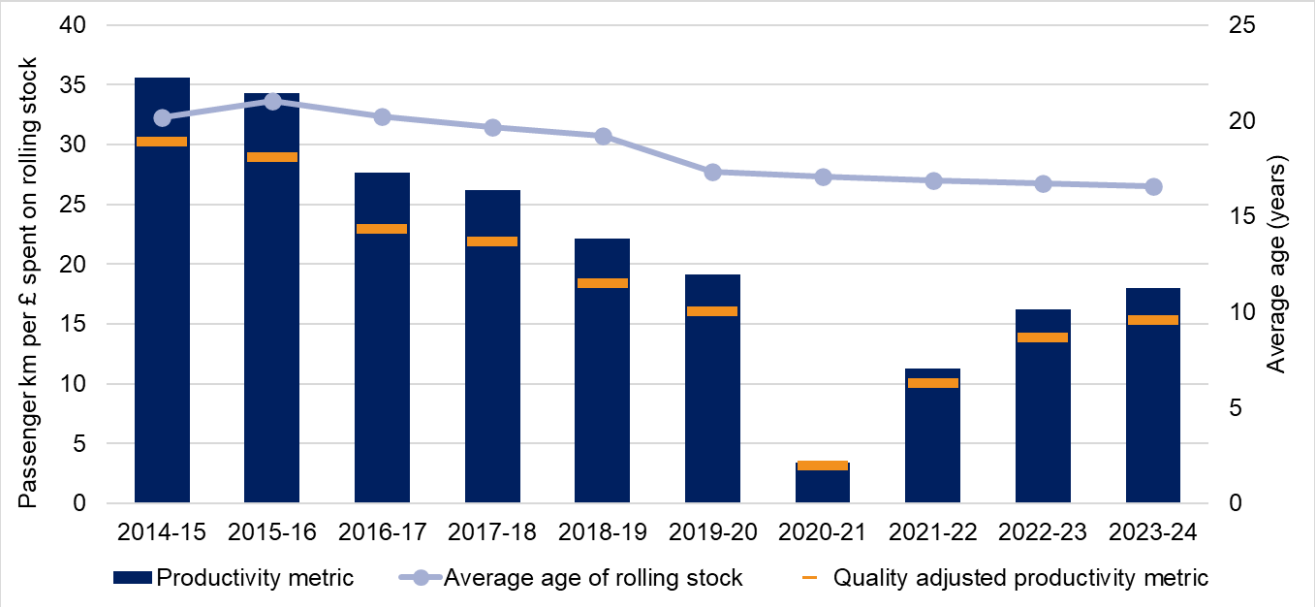
- a 6% growth in passenger demand in the six years running up to the pandemic. The industry assumed that growth would continue, and more employees would be needed, however this was affected by the pandemic;
- new operators and services, such as Lumo and the Elizabeth line;
- bringing more rolling stock maintenance in-house; and
- a greater focus on improving safety, with new policies on shift lengths and rest periods.

Passenger operator rolling stock productivity

3.7 Rolling stock productivity, as measured by passenger kilometres per pound of passenger rolling stock expenditure (including rolling stock lease charges and maintenance costs), has increased by 11% since 2022-23, but is 49% lower than in 2014-15. As mentioned previously, passenger kilometres have fallen by 4% since 2014-15.

3.8 Over the same period, rolling stock costs have increased by 89%, from £1.8 billion in 2014-15 to £3.3 billion in 2023-24. Rolling stock costs now make up 27% of operator costs and have a significant impact on our productivity measures.

Figure 3.2 Passenger kilometres per pound of passenger rolling stock expenditure (in 2023-24 prices), annual data from 2014-15 to 2023-24



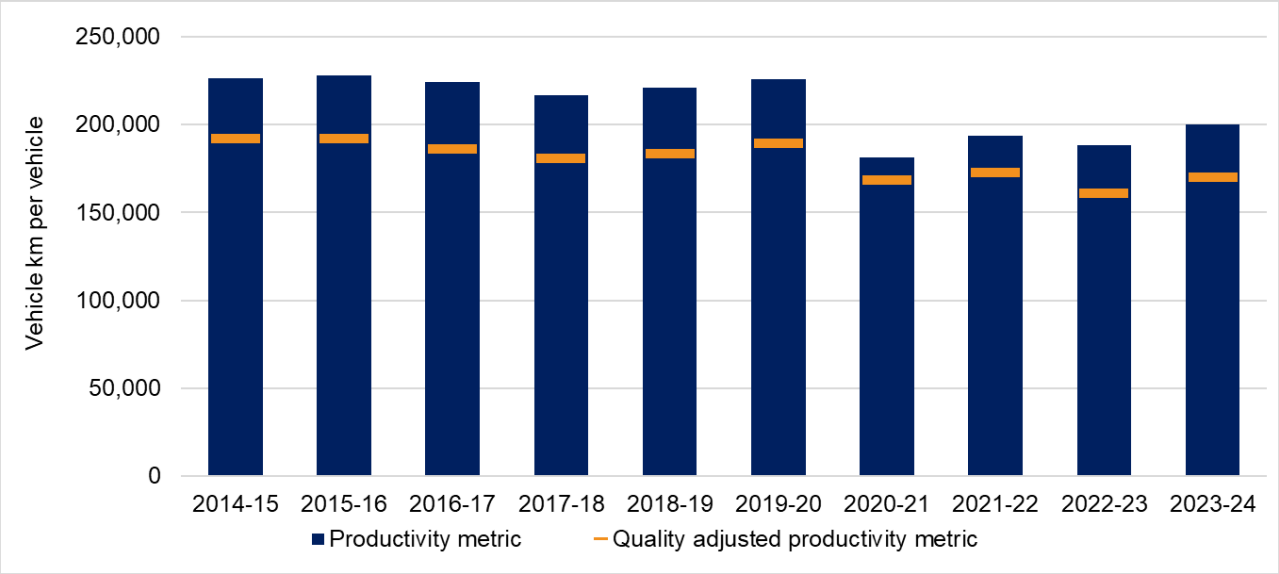
3.9 Since 2014-15, the average cost per rolling stock vehicle has increased by 60% which partly reflects the investment in new rolling stock. There has also been an increase in the number of overall vehicles of around 18% (to 15,100 vehicles) over the period.

3.10 The introduction of newer models is driven by the life expiry of existing fleets, and efforts to improve safety, the customer experience, performance and to decarbonise the industry, all of which can make new vehicles more expensive. The average age of rolling stock reduced by 3.6 years to 16.6 years over the period. Whilst this may not sound like a significant decrease, our blog on rolling stock highlights that even keeping rolling stock age constant requires yearly investment.

3.11 The expected growth in passenger demand was significantly impacted by the pandemic. Rolling stock decisions are made years in advance which can help to deliver good value for money, however, it means train operating companies are often locked into contracts and cannot quickly adjust the level of rolling stock they lease to reflect demand during unexpected events such as the pandemic.

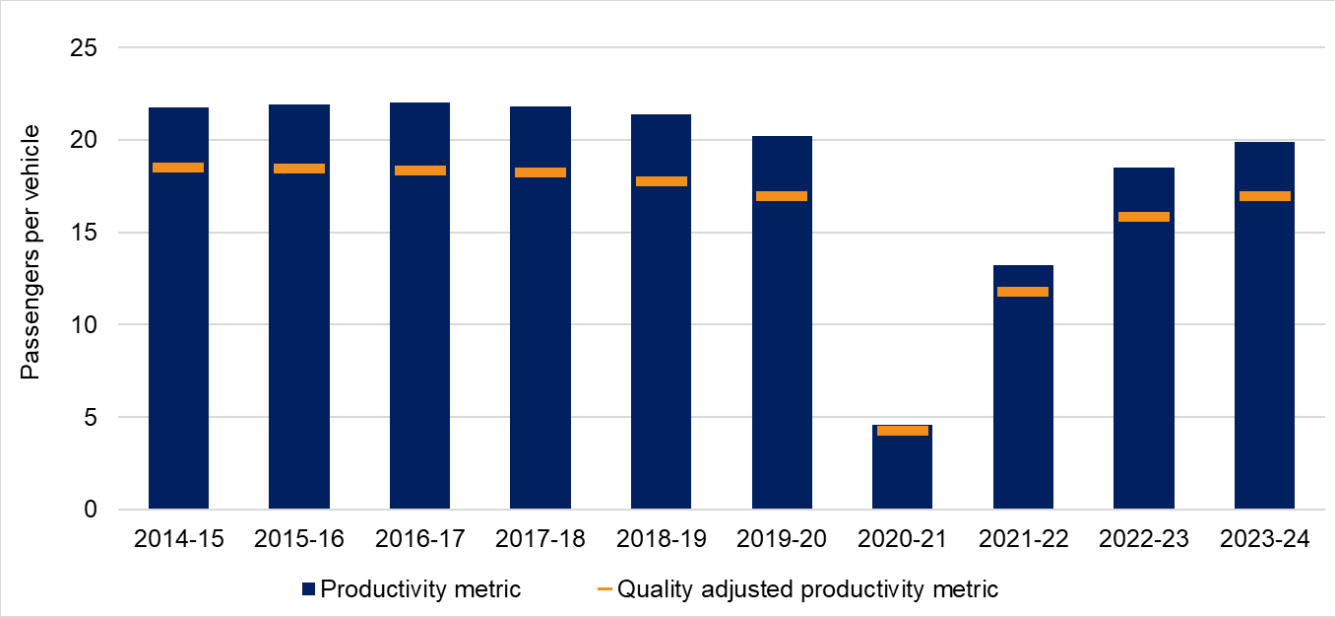
3.12 Use of rolling stock vehicles has also declined. As shown in Figure 3.3 below, the average vehicle kilometres travelled per vehicle has decreased by 12% since 2014-15, although it has improved by 6% in the latest year.

Figure 3.3 Average kilometres travelled per vehicle, annual data from 2014-15 to 2023-24



3.13 Vehicles are also less full than they were in 2014-15. The average number of passengers per vehicle has increased by 8% since 2022-23 but has decreased by 9% since 2014-25 to around 20 passengers per vehicle, as shown in Figure 3.4.

Figure 3.4 Average number of passengers per vehicle, annual data from 2014-15 to 2023-24



3.14 The average number of vehicles per train has increased from five to six vehicles since 2014-15. This may have benefits in terms of optimising the use of staff and

reducing overcrowding. However, overall, train operators are now paying more for vehicles than they were in 2014-15, and at the same time are carrying fewer passengers per vehicle and travelling shorter distances.

Passenger train operators' comparative productivity

3.15 There are also differences in productivity between passenger train operators. Figures 3.5 and 3.6 show the relative productivity of each of the 24 operators in our analysis, using both passenger kilometres and passenger journeys as an industry output.

3.16 We note that open access operators do not pay the same level of fixed charges as franchised passenger operators. We have excluded fixed track access charges from our analysis to enable a fair comparison.

3.17 Lumo, Hull Trains and Grand Central operators (all long distance open access operators) carried passengers the furthest distance for each pound spent, while the London Overground, Elizabeth Line and c2c operators carried the largest number of passengers for each pound spent. Greater Anglia and c2c also score highly when quality adjustments are included for on time and for cancellations performance.

3.18 There are good reasons why some train operators are more or less productive than others using these metrics, some within a company's control, some not. These include:

- Service level requirements set by funders can increase costs for franchised operators. Funders define the services their contracted operators must deliver, including rolling stock requirements, minimum service levels, capacity, stopping patterns and journey times. This particularly impacts regional operators where population density may be lower, yet connectivity remains important. Open access operators are not bound by the same service level requirements.

- Recovery following the pandemic has varied between operators. For example, commuter routes have recovered less quickly than leisure routes. See our passenger rail usage statistics for more detail.

Figure 3.5 Passenger kilometres per thousand pounds of passenger operator expenditure, by operator, in 2023-24 (in 2023-24 prices)

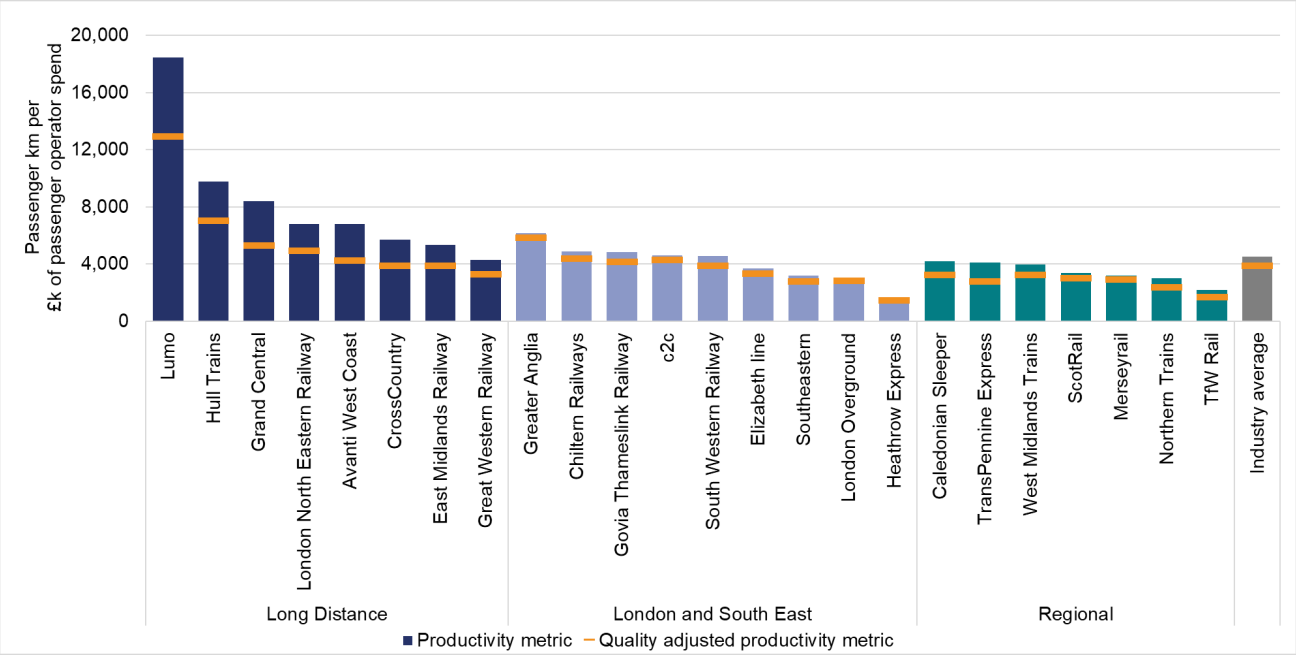
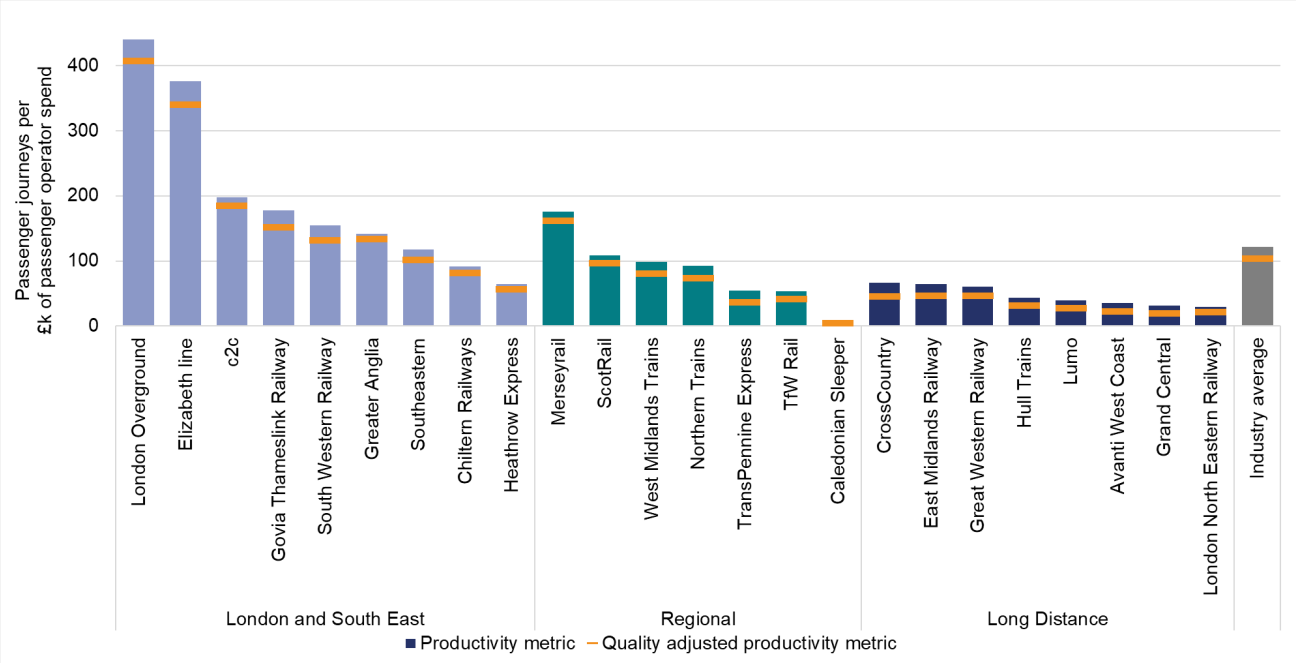


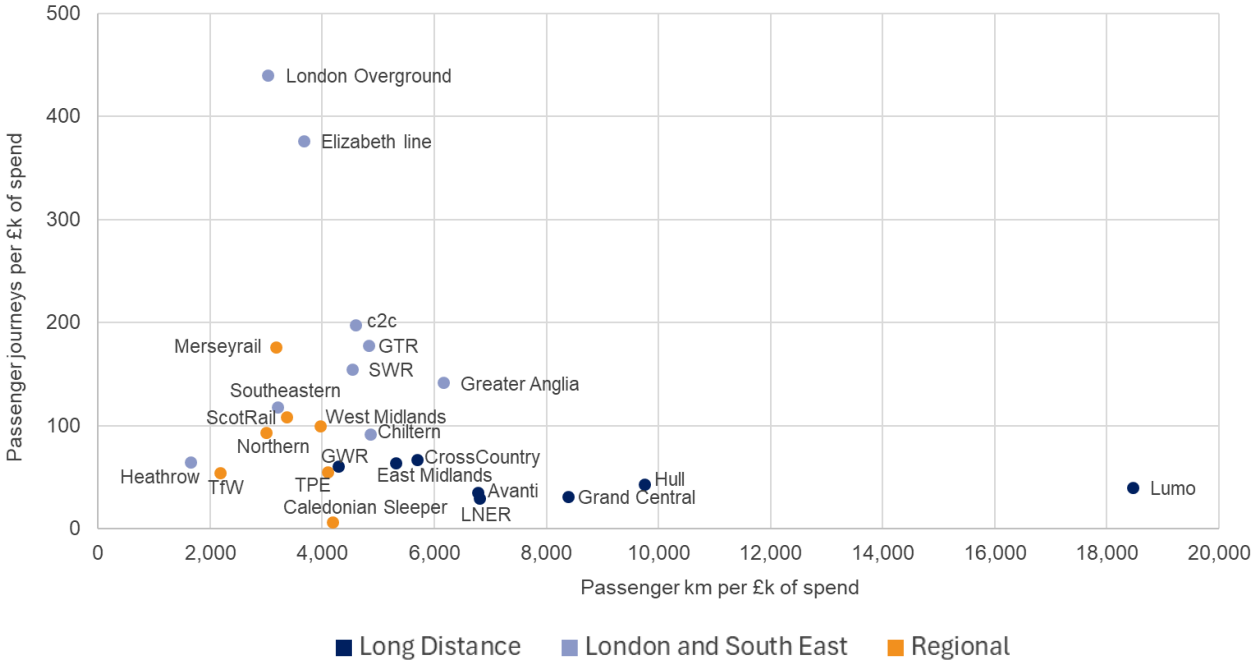
Figure 3.6 Passenger journeys per thousand pounds of passenger operator expenditure, by operator, in 2023-24 (in 2023-24 prices)



3.19 The relative productivity of individual operators can look different depending on whether we use passenger kilometres or passenger journeys as the basis of our productivity measure, for example long distance operators look much better on the former rather than the latter, which to some extent reflects the nature of the market they serve.

3.20 Figure 3.7 below is a scatter graph which plots operators using both measures. Operators towards the top right of the chart perform better using both passenger journeys and passenger kilometres.

Figure 3.7 Passenger journeys and kilometres per thousand pounds of passenger operator expenditure, by operator, in 2023-24 (in 2023-24 prices)

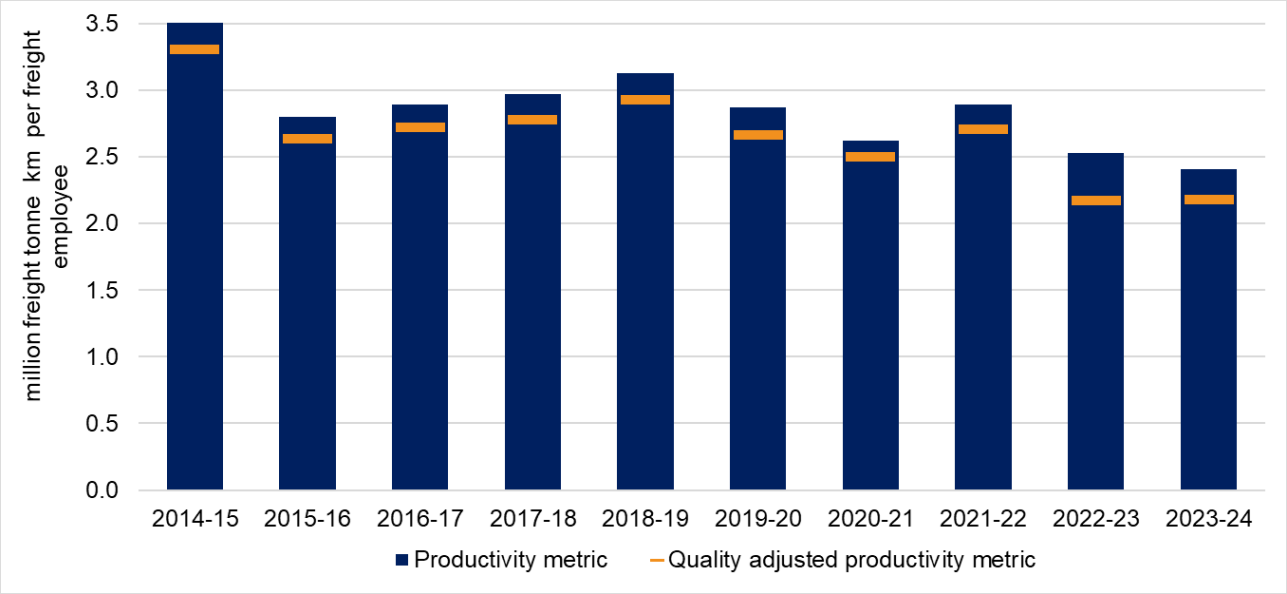


Freight operator labour productivity

3.21 The productivity of freight operators, measured by freight tonne kilometres per employee, has decreased by 5% since 2022-23 and by 31% since 2014-15, as shown in Figure 3.8 below.

3.22 When quality adjustments are included for 'on time to 15 minutes', there has been a larger decline, by 34% over the period.

Figure 3.8 Freight tonne kilometres per freight operator employee, annual data from 2014-15 to 2023-24



3.23 The decline in productivity since 2014-15 has been driven by a 29% decrease in freight tonne kilometres and a 3% increase in employee numbers. Contributing factors include:

- Rail freight can find it difficult to compete with road freight due to road freight's relative advantage on cost and, for some markets, convenience.
- Freight demand to some extent reflects the health of the wider economy and will fluctuate in line with broader economic trends.
- There has been a change in the mix of freight carried on the network as shown in Table 3.1 below. The amount of coal being transported has steadily declined as coal mines have closed. This has been offset to some extent by the growth in other commodities such as construction, intermodal and biomass.

3.24 While a fully loaded intermodal train maybe as valuable in monetary terms as a fully loaded coal train, the latter carries more tonnage due to the density of coal. Thus, tonne-kilometre based metrics alone are not a perfect measure of freight productivity. However, analysing freight train kilometres shows a similar trend, having declined by 23% since 2014-15.

Table 3.1 Change in freight tonne kilometres carried, by commodity, from 2014-15 to 2023-24

Commodity	Change in freight tonne kilometre
Coal	▼Decline of 99%
Metal	▼Decline of 40%
Construction	▲Increase of 39%
Biomass	▲Increase of 17%
Intermodal	▲Increase of 3%

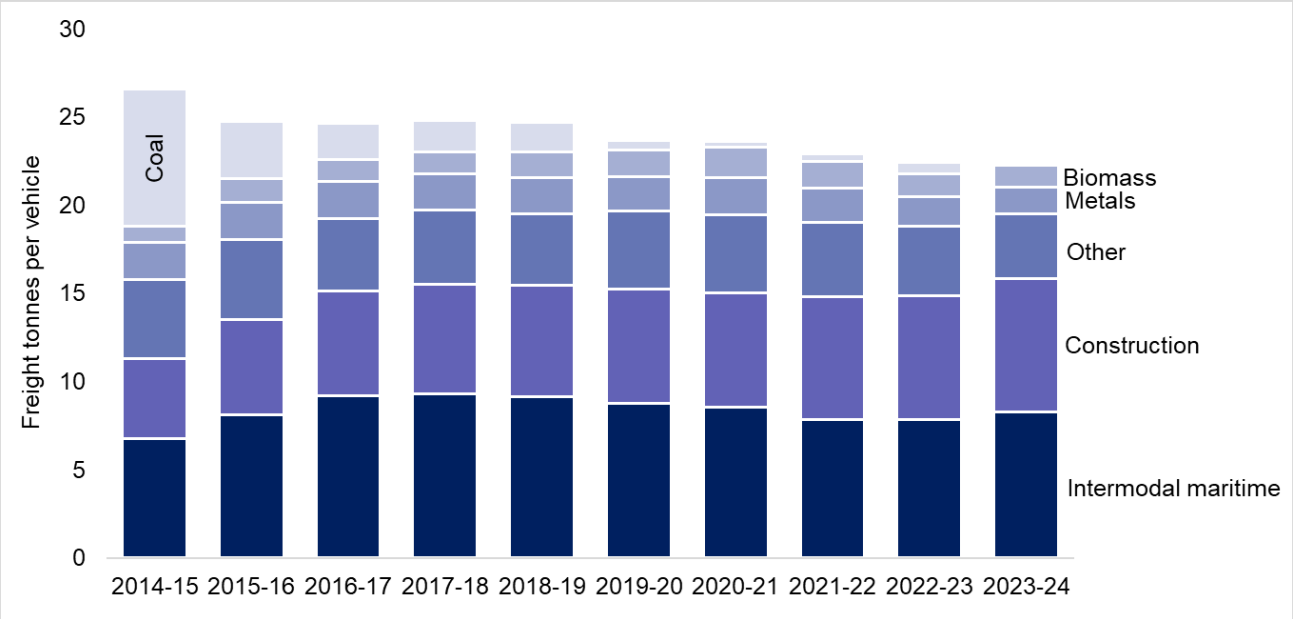
3.25 Freight operators have found it difficult to replace the routes that were dedicated to coal as the origins and destinations of the new mix of commodities are not the same. Track near former coal mines is not as useful for other freight. Other freight (particularly for construction) often travels to locations where it must compete more with passenger operators for use of the network.

Freight rolling stock productivity

3.26 The average freight tonnes carried per vehicle has decreased by 16% since 2014-15 (with minimal change since 2022-23). As explained above, this decrease largely relates to the decline in coal freight tonne kilometres.

3.27 The average number of vehicles (including locomotives and carriages) per freight train has increased from 20 to 22, showing efforts to optimise the use of resources.

Figure 3.9 Freight tonnes carried per vehicle, by commodity, annual data from 2014-15 to 2023-24



4. Infrastructure metrics

4.1 We have analysed the productivity of the UK rail infrastructure by measuring train kilometres per Network Rail employee and by measuring effective volumes delivered per million pounds of expenditure across a sample of Network Rail's core assets.

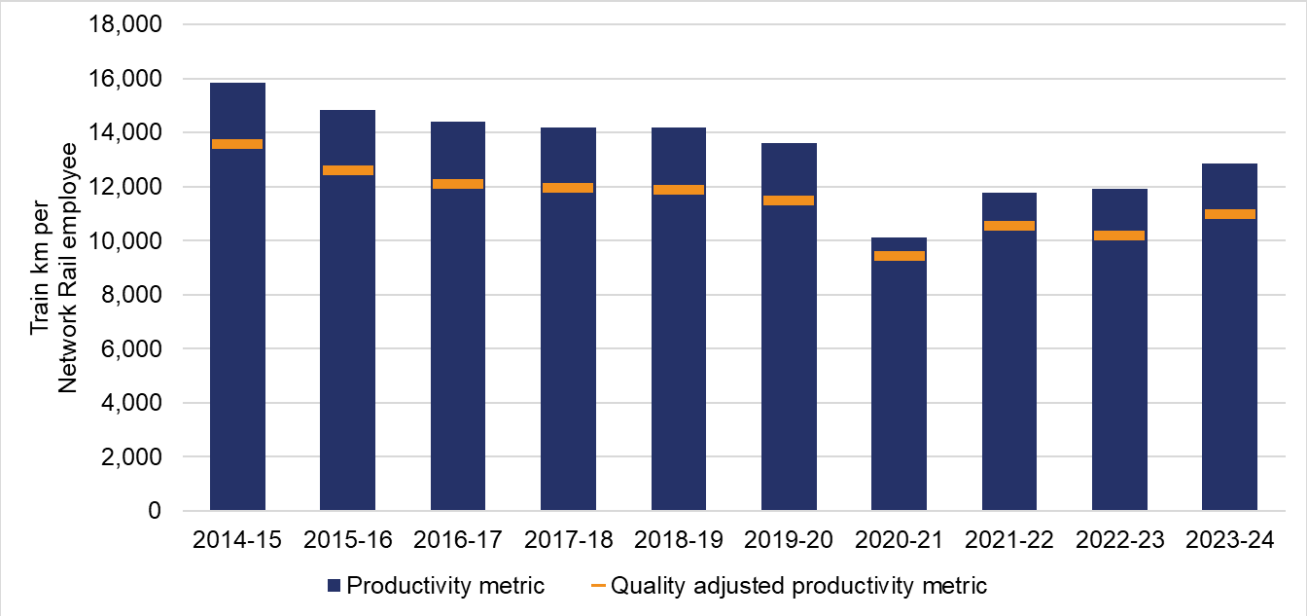
Network Rail's overall productivity

4.2 Network Rail's overall productivity, as measured by total train kilometres per Network Rail employee, has improved 8% year-on-year, although it has declined 19% since 2014-15.

4.3 Network Rail's productivity has been consistent with the trends of the wider rail industry in recent years: it showed declining productivity over the period 2014-15 to date, initially driven by increasing staff numbers, but with a significant drop (28%) between 2019-20 and 2020-21, driven by the decline in train kilometres due to the pandemic.

4.4 As is the case with the wider rail industry metrics, there has been a recovery in this productivity measure since the pandemic, although in the case of Network Rail this has now recovered to 95% of pre-pandemic (2019-20) levels, while the recovery in the train operating company productivity has been slower (up to 88% of pre-pandemic levels by 2023-24).

Figure 4.1 Train kilometres per Network Rail employee, annual data from 2014-15 to 2023-24



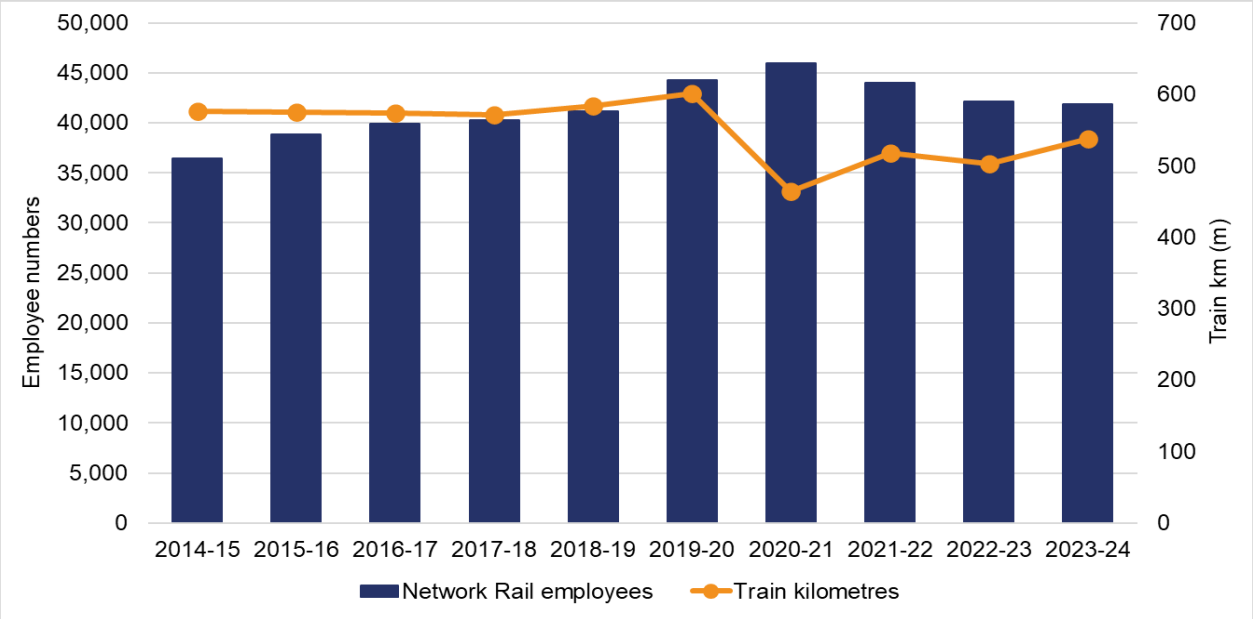
4.5 As noted above, the 19% reduction in productivity between 2014-15 and 2023-24 was heavily impacted by the reduction in train kilometres in 2020-21. However, there was a declining trend in Network Rail's productivity prior to this point, driven by staff numbers increasing faster than the rise in train distance travelled on the network.

4.6 Network Rail's headcount over the period 2014-15 to 2023-24 increased by 15%, from 36,416 to 41,836. Most of this increase occurred between 2014-15 and 2019-20, when headcount grew 21%, including a 7% jump going into 2015-16. This was due to Network Rail insourcing part of its maintenance and renewals function. During this time train kilometres remained fairly stable, as can be seen in Figure 4.2, with just a 4% rise over the five years to 2019-20.

4.7 There was also an increase in headcount in 2020-21, at the time Network Rail carried out its Putting Passengers First initiative (its internal re-organisation to create five regional business units supported by fewer national functions), with a 4% increase in staff numbers.

4.8 The drops in productivity in 2015-16 and 2020-21 can be seen in Figure 4.1 above (noting that 2020-21 was also impacted by a reduction in train kilometres).

Figure 4.2 Network Rail employee numbers and total train kilometres, annual data from 2014-15 to 2023-24



4.9 More recently there has been a fall in Network Rail's employee numbers, reflecting internal restructuring initiatives (for example its modernising maintenance programme) and the results of voluntary redundancy programmes. A concurrent increase in train kilometres, as passenger travel patterns have normalised, has led to an improvement in Network Rail's productivity by this measure.

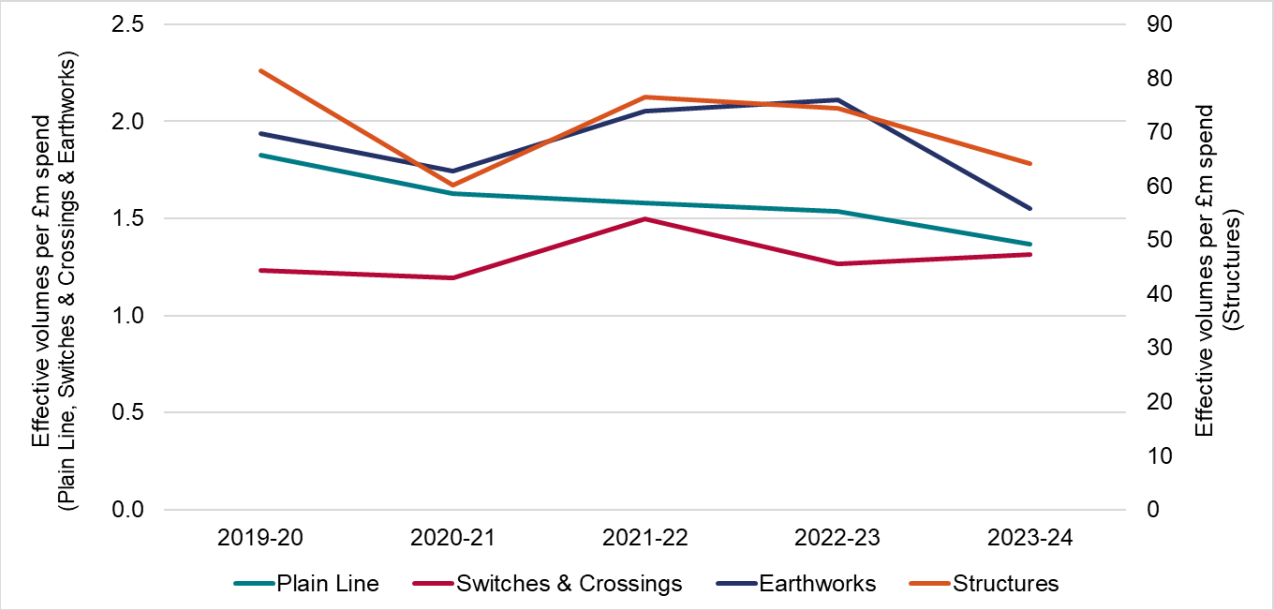
Productivity of renewals delivery

4.10 Using train kilometres as a productivity output gives us a high-level understanding of how Network Rail contributes to industry productivity. We have also measured the productivity of its renewal of core rail assets. We have focussed this measure on Network Rail's expenditure as a lot of the staff delivering renewals work are subcontractors, and therefore not included in Network Rail's headcount.

4.11 Productivity of Network Rail's renewals delivery, measured as effective volumes delivered per million pounds of expenditure, has declined by between 20% and 25% across Control Period 6 (CP6) (April 2019 to March 2024) for most asset types considered. For switches and crossings assets it improved by 7%.

4.12 Delivery of renewals works is one of the largest areas of expenditure for Network Rail, making up 40% of its total operations, support, maintenance and renewals expenditure in 2023-24, so we have focussed on this area of expenditure in more detail. We have only calculated this measure for a five-year period as effective volumes measures were only introduced at the start of CP6.

Figure 4.3 Effective volumes delivered per million pounds of expenditure (in 2023-24 prices), by asset type, annual data from 2019-20 to 2023-24



4.13 Across most assets considered (except switches and crossings) there was a trend for reducing productivity over CP6. This may be explained by the following factors:

- **the impact of the pandemic** on Network Rail's planned renewals, for example the need to defer or cancel work or cost increases due to social distancing requirements;
- **increases in some materials costs above inflation** because of global supply issues;
- **the impact of industrial action** on planned work towards the end of the control period; and
- **loss of economies of scale** as lower volumes were delivered in most asset categories in the final year of CP6.

4.14 In 2020-21 the requirements to wear more personal protective equipment (PPE) and to maintain social distancing added significant cost to Network Rail's renewals delivery (as discussed in ORR's Annual Efficiency and Finance Assessment for 2020-21) and Network Rail's productivity fell. This impacted on all asset types and was despite delivering high volumes of renewals.

4.15 Delivery of different types of renewals can also have a significant impact on the productivity of renewals works. This can lead to better or worse productivity, depending on the change in work mix.

Plain line track

4.16 Productivity in the delivery of plain track renewals declined 25% from 2019-20 to 2023-24. Effective volumes (measured in linear kilometres renewed) declined by 31% over the same period, which is linked to increases in the price of track materials above inflation and the consequential impact on the volumes of renewals delivered to stay within a fixed budget. In general, across CP6, a decline in volumes of plain line track delivered was consistent with a reduction seen in overall productivity. This trend can also be seen when the data is disaggregated across regions, with the region delivering the highest volumes of track renewals (Eastern region) being the most productive.

Switches and crossings

4.17 Productivity in delivery of switches and crossings renewals increased by 7% from 2019-20 to 2023-24, although there was variation in this over the five years. Productivity in renewing these assets was highest in 2021-22, which reflects a peak in effective volumes delivered. During the pandemic several of Network Rail's regions found that it was easier to negotiate access to the rail network with train operating companies, due to the reduced number of trains running, so Network Rail completed longer periods of engineering work and delivered more volumes than under typical conditions, which was particularly beneficial to switches and crossings delivery.

Earthworks

4.18 Productivity in delivery of earthworks renewals declined by 20% from 2019-20 to 2023-24. At a regional level there was significant fluctuation in productivity levels, with the most productive region (Scotland) more than four times as productive as the least (Southern). We expect significant regional variations in earthworks delivery due to the very different geological settings, for example softer geology in southern England can be more challenging, and therefore more expensive, than areas with more rock, such as Scotland.

Structures

4.19 Productivity in delivery of structures renewals decreased by 21% from 2019-20 to 2023-24, with a significant dip in 2020-21, in part because of cost increases linked to the pandemic. Structures productivity showed significant variance over CP6, particularly between different regions, although we recognise that this work is less repeatable than other asset types due to the mix of structures requiring renewal.

5. Gross value added (GVA)

5.1 Gross value added or GVA is a way of measuring the economic contribution of the railway to the wider economy. In this section we show changes in rail industry GVA over time, and then present a productivity metric, rail industry GVA per employee.

5.2 GVA represents the difference between the value of output (what is produced) and the value of intermediate consumption (the cost of inputs and raw materials used to produce the output).

(a) Inputs – the cost of all inputs and raw materials that are directly attributable to the railway, e.g. rail employment costs, or the cost of steel for track.

(b) Outputs – the value of products and services produced within the industry, e.g. fares revenue.

5.3 Our analysis includes passenger and freight operators, and Network Rail GVA. It does not include the GVA of the wider rail supply chain, which we acknowledge also adds significant value to the wider economy. This is something we will aim to develop in future editions of this report.

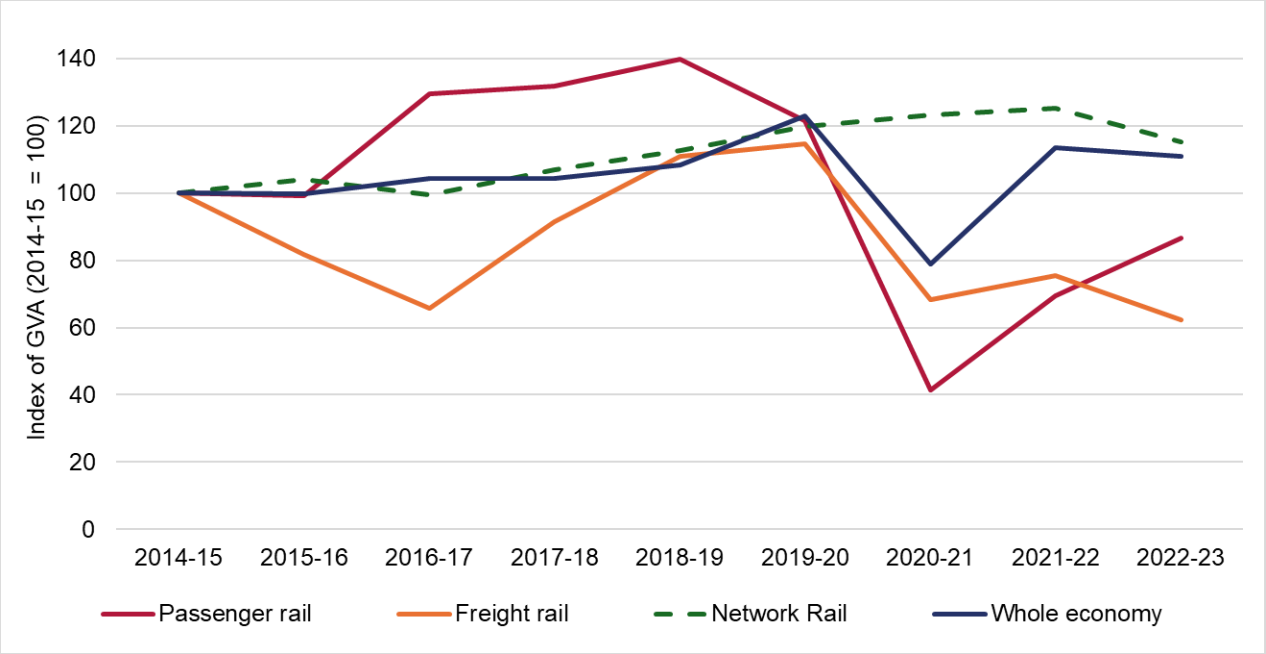
5.4 The GVA data for passenger and freight operators is sourced from the Office for National Statistics and the Network Rail data is sourced from its annual accounts. Further information on the data used can be found in our methodology in Annex C.

Rail industry GVA

5.5 Our analysis suggests that the GVA of passenger rail in 2022-23 (the most recent year of our analysis) was approximately £4.0 billion, freight rail £0.3 billion and Network Rail £5.5 billion.

5.6 Figure 5.1 below shows how rail sector GVA compares to the wider economy between 2014-15 and 2022-23. It shows that passenger and freight operators were significantly impacted by the pandemic, more so than the wider economy, whilst Network Rail was less affected. This is because operators experienced significant declines in revenue during this period, whereas Network Rail's income was less affected, as the majority is provided through government funding.

Figure 5.1 Index of GVA (in 2023-24 prices), annual data from 2014-15 to 2022-23



Note: Network Rail GVA was calculated using a different approach to the other three GVA measures and so is shown as a dotted line. This is explained further in our methodology section in Annex C.

GVA labour productivity

5.7 GVA per employee can be used as an indicator of the productivity of the rail industry, i.e. how much value is added for each rail industry employee.

5.8 Productivity of the rail industry, as measured by GVA per employee, has shown a mixed picture. In the most recent year for which we have data (2022-23 compared with 2021-22), there was a notable improvement in passenger rail (25%) but a decline in freight rail of 22%. There was a slight decline (4%) for Network Rail in the most recent year, which mirrors the movement in the wider UK economy.

5.9 In the longer term, productivity of passenger and freight rail has fallen since the onset of the pandemic and is yet to recover to pre-pandemic levels. Network Rail GVA per employee has been consistently higher than the other parts of the rail industry over the period (since 2014-15) and was less affected during the pandemic as noted above.

5.10 The overall change in GVA labour productivity over this period (2014-15 to 2022-23) was a:

(a) 24% reduction for passenger rail;

(b) 22% reduction for freight rail; and

(c) 1% reduction for Network Rail.

5.11 The following factors may explain some of the trends shown below in Figures 5.2 and 5.3:

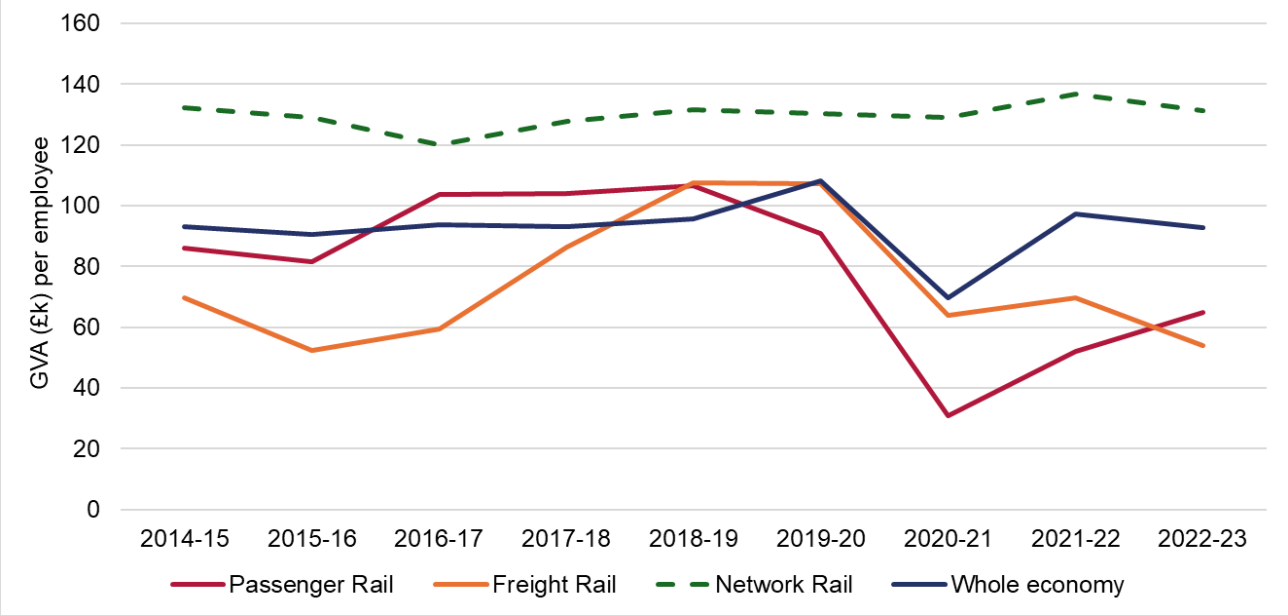
(a) Passenger rail GVA per employee fell by 66% during the pandemic, due to passenger journeys falling by 78% from 2019-20 to 2020-21. It has since recovered by 110% (although it is still below pre-pandemic levels) due to the introduction of the Elizabeth line as well as a general increase in passenger numbers across commuting and leisure travel.

(b) Freight rail GVA per employee increased by 54% from 2014-15 to 2019-20 but declined by 40% in 2020-21 due to the impact of the pandemic. Before the pandemic there was a change in the mix of freight carried on the network, with a decline in the transportation of coal and metals and growth in other commodities such as construction, intermodal and biomass. This change in the mix of freight being carried will impact GVA. Post pandemic, the fall in GVA per employee can be attributed to the fall in freight net tonne kilometres of 5% since 2019-20, and that freight operators have been unable to replace the routes that were previously dedicated to coal.

(c) Network Rail GVA per employee is consistently higher than both passenger rail and freight rail GVA per employee during the period, largely due to Network Rail's funding agreements with governments and Network Rail's expenditure (a significant contributor to GVA) remaining largely consistent over this period.

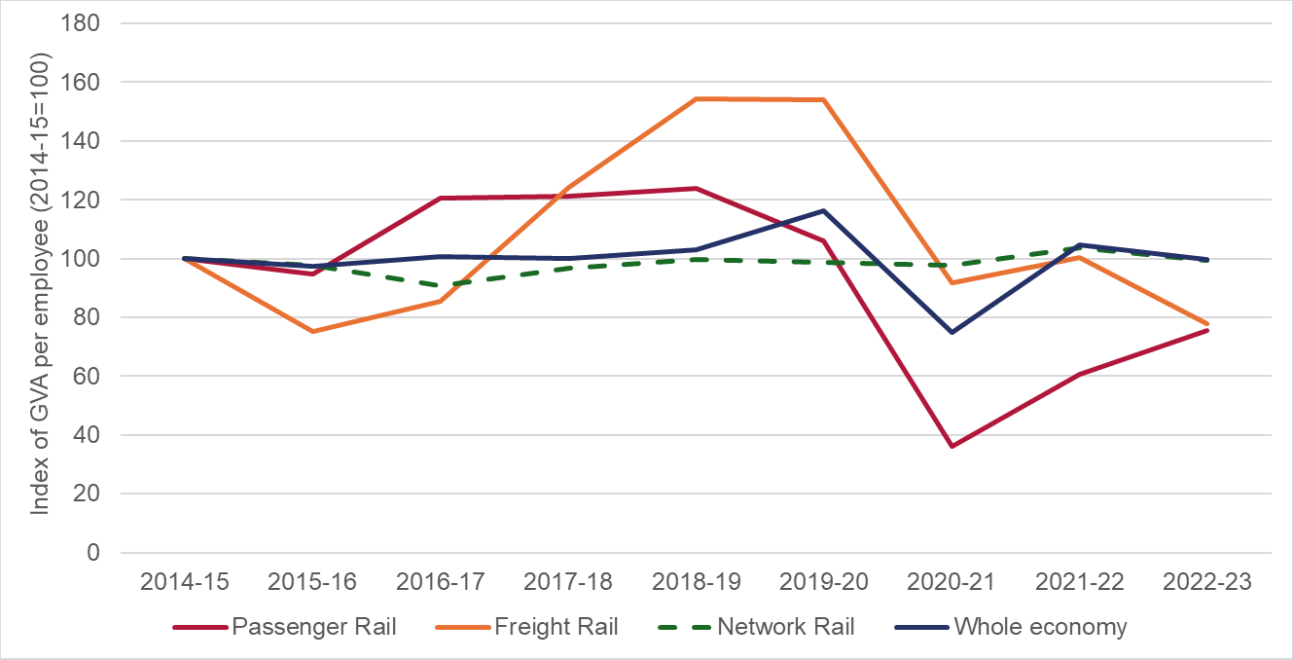
(d) UK-wide GVA per employee is generally in line with passenger rail GVA per employee pre-pandemic, however from 2019-20 to 2020-21 it dropped by only 36% as compared to 66% for passenger rail GVA per employee. The rail industry was heavily impacted by restrictions on travel during the pandemic, whereas the wider economy had a more mixed impact over this period, which is reflected in the GVA data.

Figure 5.2 Gross Value Added (in 2023-24 prices) per employee, annual data from 2014-15 to 2022-23



Note: Network Rail GVA was calculated using a different approach to the other three GVA measures and so is denoted as a dotted line. This is detailed further in our methodology in Annex C.

Figure 5.3 Change in Gross Value Added (in 2023-24 prices) per employee, annual data from 2014-15 to 2022-23



Annex A: Summary of all productivity metrics

Productivity metrics	% change 2023-24 vs 2014-15	% change 2023-24 vs 2022-23
Industry wide metrics		
Train kilometres per £k of industry expenditure	-25%	7%
Train kilometres per industry employee	-19%	6%
Passenger train operator metrics		
Passenger kilometres per employee	-18%	11%
Passenger kilometres per £ of expenditure	-25%	9%
Passenger kilometres per £ of rolling stock expenditure	-49%	11%
Passenger journeys per £ of expenditure	-23%	12%
Average passenger vehicle kilometres per vehicle	-12%	6%
Average passenger vehicle load factors	-9%	8%
Average number of vehicles per passenger train	11%	-2%
Gross value added per passenger operator employee *	-24%	25%
Freight train operator metrics		
Freight train kilometres per £k of expenditure	-4%	2%
Freight tonne kilometres per £k of expenditure	-11%	3%
Freight tonne kilometres carried per employee	-31%	-5%
Average freight vehicle load factors	-16%	0%
Average number of vehicles per freight train	10%	2%
Gross value added per freight operator employee *	-22%	-22%
Infrastructure metrics		
Train kilometres per Network Rail employee	-19%	8%
Train kilometres per £k of Network Rail expenditure	-34%	10%
Plain Line renewal volumes per £m of expenditure	n/a	-11%
Switches and crossings renewal volumes per £m of expenditure	n/a	4%
Structures renewal volumes per £m of expenditure	n/a	-14%
Earthworks effective renewal volumes per £m of expenditure	n/a	-26%
Gross value added per Network Rail employee *	-1%	-4%

* Gross value added data is only available up to 2022-23. Therefore, the variances for the GVA metrics in the table are from 2014-15 to 2022-23 and from 2021-22 to 2022-23.

Annex B: Passenger operator comparisons

TOC	Category	Expenditure*		Labour**		Rolling stock		
		Passenger km per £	Passenger journeys per £	Passenger km per employee	Passenger journeys per employee	Passenger km per rolling stock £	Vehicle utilisation (vehicle kms per vehicle)	Load factors (passengers per vehicle)
		Ranking (1 is best performing, while 24 is worst performing)						
Lumo	Long Distance (OA)	1	20	1	20	4	1	1
Hull Trains	Long Distance (OA)	2	19	3	19	2	3	3
Grand Central	Long Distance (OA)	3	22	4	21	1	11	2
CrossCountry	Long Distance	7	13	10	13	17	5	6
Avanti West Coast	Long Distance	5	21	5	18	15	2	10
London North Eastern Railway	Long Distance	4	23	6	23	18	4	5
East Midlands Railway	Long Distance	8	15	12	15	7	6	12
Great Western Railway	Long Distance	13	16	13	14	24	7	11
Elizabeth line	London and South East	17	2	7	1	11	18	13
c2c	London and South East	11	3	2	3	21	22	15
Greater Anglia	London and South East	6	7	8	5	10	12	20
Govia Thameslink Railway	London and South East	10	4	9	4	16	14	19
Chiltern Railways	London and South East	9	12	11	10	9	16	4
London Overground	London and South East	21	1	16	2	3	23	8
South Western Railway	London and South East	12	6	14	7	8	17	17
Southeastern	London and South East	19	8	19	8	19	21	21
Heathrow Express	London and South East (OA)	24	14	17	6	12	9	24
TransPennine Express	Regional	15	17	15	16	5	8	9
West Midlands Trains	Regional	16	10	18	11	13	13	16
Merseyrail	Regional	20	5	22	9	6	24	7
ScotRail	Regional	18	9	21	12	23	15	22
Northern Trains	Regional	22	11	23	17	20	19	14
Caledonian Sleeper	Regional	14	24	20	24	22	10	23
TfW Rail	Regional	23	18	24	22	14	20	18

* Expenditure excludes fixed track access charges
** Excludes station staff
(OA) denotes open access operators

Annex C: Methodology

C.1 This report brings together productivity measures from over 30 rail industry companies over a 10-year period. We have included franchised (government funded) passenger operators, open access (non-franchised, or non-government funded) passenger operators, freight operators, Network Rail, HS1 Ltd and CVL (where the data is available). Our analysis covers Great Britain but excludes Northern Ireland.

C.2 Productivity is defined as a ratio between outputs and inputs:

$$\text{Productivity} = \frac{output}{input}$$

Productivity increases when more (or higher quality) outputs are delivered with the same or fewer resources.

C.3 Our analysis primarily uses two key inputs:

- **expenditure** is the input for our headline metric, providing a comprehensive view of the entire industry. This approach captures labour, infrastructure and rolling stock productivity, ensuring consistency across different parts of the rail sector. It also accounts for both outsourced services and in-house operations.
- **employee numbers** are used as an input elsewhere in the report, particularly for key productivity metrics related to passenger and freight operators, as well as Network Rail. While labour-based metrics may not fully capture the level of outsourced services, they offer a simpler measure of productivity, reflecting the critical role of the workforce in the UK rail industry. Labour-based metrics are also less affected by external factors such as exchange rate fluctuations and input price changes, which could distort expenditure-based measures.

C.4 We use different output metrics, depending on the availability and comparability of data, and which output is most relevant to the measure of productivity we are developing. The outputs used in our analysis include:

- **train kilometres** refer to the train distances travelled on Network Rail, Core Valley Lines, HS1, and TfL infrastructure. Empty coaching stock movements are included. This output can be used for both freight and passenger operators and therefore provides a comprehensive view of the entire industry.

- **vehicle kilometres** refer to the vehicle distances travelled on the GB network. A train with a locomotive and four carriages travelling one kilometre will generate one train kilometre and five vehicle kilometres.

- **passenger kilometres** are calculated by multiplying the number of passenger journeys on a particular flow by the number of corresponding track kilometres between stations. If one train carrying 200 passengers travels 10 kilometres, we would report 10 train kilometres, 200 passenger journeys and 2000 passenger kilometres (200 multiplied by 10 kilometres). We use passenger kilometres as the output for most of our passenger operator metrics as it captures the combined effect of passenger numbers and travel distances, indicating how much the railway service is being utilised.

- **passenger journeys** are estimated using ticket sales data. For the purpose of these statistics, where travel requires one or more changes of train each train used is counted as one journey.

- **freight tonnes lifted** refers to the mass of goods (tonnes) carried on the rail network, excluding the weight of the locomotives and wagons. This measure takes no account of the distance travelled.

- **freight tonne kilometres** are the amount of freight which is moved on the railway. Freight moved is measured in net tonne kilometres and covers the net weight of the goods carried and the distance carried. If one train carrying 400 tonnes of freight travels 10 kilometres, we would report 10 freight train kilometres, 400 tonnes of freight lifted and 4,000 freight tonne kilometres.

- **Network Rail effective renewal volumes** measure how much additional life Network Rail's renewal activities add to its assets, which provides a medium-term view of asset sustainability. It is calculated as a weighted aggregation of renewals volumes, where the weighting distinguishes between activity types and their different impacts on asset life.

- **Gross Value Added** is an economic productivity metric that can be used to establish the contribution of the rail industry to an economy. GVA provides a value for the services provided, minus the cost of all inputs and raw materials that are directly attributable to that service (see GVA section below for more detail).

C.5 This report largely draws upon information that is already in the public domain, including ORR's official statistics as published on ORR's data portal. Table A.1 summarises the sources utilised in calculating our metrics.

Table C.1 Sources used in calculating our metrics

Data		Source
Distance travelled	Freight train kilometres	Table 1333
	Freight vehicle kilometres	Table 1343
	Passenger train kilometres	Table 1243
	Passenger kilometres	Table 1230
	Passenger vehicle kilometres	Table 1253
Other industry outputs	Passenger journeys	Table 1223
	Freight tonnes moved	Table 1310
	Network Rail effective renewal volumes	Provided to ORR by Network Rail
Number of employees	Number of passenger train operator employees	Table 2233
	Number of freight operator employees	Companies House
	Number of Network Rail employees	Network Rail's regulatory financial statements and information
Expenditure	Franchised passenger train operator expenditure	Table 7226
	Non franchised passenger train operator expenditure	Table 7233
	Freight train operator expenditure	Table 7243
	Network Rail expenditure	Table 7216 and Network Rail's regulatory financial statements
Rolling stock	Rolling stock age	Table 6313
	Rolling stock vehicle numbers	RDG Table 6314
Quality of service	Passenger train delays	Table 3138
	Passenger train cancellations	Table 3123
	Freight Delivery Metric (delays)	Table 1324
	Freight cancellations and lateness	Table 1365
GVA	Approximate GVA	ONS website
	GVA	ONS website
	Estimate of Network Rail GVA	Companies House

Train Operating Companies

Franchised passenger operators

C.6 Franchised passenger operators run services under contracts awarded by franchising authorities (DfT, Transport Scotland, Transport for Wales, Transport for London, and Merseytravel) and operate under service requirements set by these bodies. We have used operators' management accounts data in our analysis.

Non-franchised (open access) operators

C.7 Open access operators operate without taxpayer subsidies. Prospective open access rail operators must gain ORR approval, which considers factors like attracting new passengers to the network and enhancing competition through lower fares or innovation. Data is provided for four open access operators: Grand Central, Heathrow Express, Hull Trains, and Lumo. Financial data is based on bespoke returns to ORR and published financial accounts, where available. Financial data for Hull Trains for April 2023 to March 2024 was not available. An estimate was therefore made for the latest year using data held for 2022-23 and uplifted for inflation.

Freight operators

C.8 Freight operators transport goods across the country. Freight operator financial information is sourced from statutory accounts. An estimate of freight expenditure was made when data was unavailable, using data held for other years, adjusted for inflation.

Rail Infrastructure

Network Rail

C.9 Network Rail is the infrastructure manager for the main railway network of Great Britain.

C.10 Network Rail financial information is primarily based on its regulatory financial statements for the financial year.

C.11 The exception to this is the data used in analysing Network Rail's renewals productivity, which is based on reporting provided by Network Rail to ORR at the end of Control Period 6. This data does not have the same status as official statistics data used elsewhere in our analysis and we are aware of some potential errors in the classification of costs across regions. However, the data quality is considered sufficiently robust to support the high-level analysis we have undertaken.

C.12 We analyse the productivity of Network Rail's delivery of four core assets, which are defined below. We have analysed Network Rail's core renewals, as these are the most important to its operation of the railway's infrastructure. We have excluded those core

renewals where there was insufficient data available, or the inherent characteristics of the assets made analysis impractical.

Table C.2 Definitions of core assets

Core asset	Definition
Plain line track	Sections of track without switches and crossings (see below).
Switches and crossings	Moveable sections of track that guide trains from one track to another and allow them to cross paths.
Structures	In this context, bridges (either going over the railway or going under the railway).
Earthworks	The cuttings (to lower the track from surrounding terrain) and embankments (to raise the track above surrounding terrain) required for the railway to remain on a level path, or a safe gradient.

HS1 Limited

C.13 High Speed 1 Limited has a 30-year concession to operate and manage the railway between London St Pancras and the Channel Tunnel. Our data is sourced from its financial accounts.

Core Valley Lines (CVL)

C.14 The Core Valley Lines (CVL) network was transferred from Network Rail to Transport for Wales on 28 March 2020. While the CVL is included within the industry-wide metrics, it has been excluded from the more detailed rail infrastructure analysis due to the lack of available data. Financial data is based on bespoke returns to ORR.

Our Adjustments

Quality adjustments

Passenger operators

C.15 We make quality adjustments to passenger operator outputs by multiplying distances travelled by the 'Time to 3' percentage as published on the ORR data portal. 'Time to 3' is a measure of punctuality and reflects the percentage of recorded station stops arrived at early, or less than three minutes after the scheduled arrival time.

C.16 We have used 'Time to 3' to adjust passenger train kilometres because of its close links to the 'On time' measure we currently use to measure Network Rail's performance, with a recognition that for long distance services most customers are likely to be less concerned about short delays. Following our review and consultation on the train

performance reset, 'Time to 3' will become the main success measure for England and Wales train punctuality for years 3 to 5 of the current control period (Control Period 7) for Network Rail.

C.17 More insight into the methodology used for ORR's passenger rail performance metrics can be found in the passenger rail performance quality and methodology report.

Freight operators

C.18 We make quality adjustments to freight operator outputs by multiplying freight tonne kilometres by the Freight Delivery Metric (FDM) percentage. FDM measures the percentage of commercial freight trains that arrive at their planned destination within 15 minutes of their booked arrival time, or with less than 15 minutes of delay. FDM can be found on our data portal.

C.19 More insight into the methodology used for ORR's freight rail performance metrics can be found in the freight rail usage and performance quality and methodology report.

Financial adjustments

Network Rail financing costs

C.20 We have excluded Network Rail's financing costs from the calculation of industry expenditure used in our headline metric in Chapter 2 (total passenger and freight train kilometres per thousand pounds of industry expenditure). A large proportion of Network Rail's finance costs relate to historic index-linked debt over which Network Rail has limited control, and which is funded separately from its operations, support, maintenance and renewals expenditure.

Industry-wide consolidation adjustments

C.21 For the industry-wide metrics, we have made consolidation adjustments to remove intra-industry costs which are charged from one part of the industry to another, for example the access charges which are paid by train operators to Network Rail and HS1 Limited. This is consistent with the approach in our Rail Finance (UK) report. In the latest financial year, 2023-24, this resulted in £3.1 billion being removed from industry income and expenditure.

Consumer Price Index (CPI) adjustments

C.22 CPI is used throughout our analysis to adjust for the effect of inflation and all numbers are in a consistent April 2023 to March 2024 price base, unless otherwise stated. More insight into the methodology used for our Rail Finance (UK) report can be found in the rail industry finance quality and methodology report.

Limitations to our adjustments

C.23 This report is subject to a quality assurance process and data is shown on a comparable basis where possible. However, the following limitations exist:

- changes to accounting standards and / or the categorisation of costs may affect the way costs are reflected in our analysis (particularly for rolling stock cost analysis);
- most companies included in this report prepare financial data on an April to March financial year basis, however some companies prepare accounts on a calendar basis (January to December); and
- some TOCs will outsource some parts of their operations, which may affect comparisons between companies, especially for headcount. For example, some operators are responsible for station management while others are not. See our data portal for more details.

GVA

C.24 Gross Value Added can be used to establish the contribution of the rail industry to the wider economy. The passenger, freight and Network Rail GVA data in our analysis is based on the following sources:

- **ONS GVA** is based upon comprehensive National Accounts data. This is the nationally recognized measure of GVA, used in the UK National Accounts and regional economic statistics. It covers the entire economy.
- **Approximate GVA** (aGVA) is based upon the ONS's Annual Business Survey (ABS) and is used to estimate the value generated by businesses within an industry. The measure focuses upon sectors like production, construction, distribution, and services and the data available is on a more granular basis than the National Accounts.
- **Network Rail annual reports** enable GVA to be measured by adding total employee compensation and capital depreciation. This method is used for calculating Network Rail's GVA where there is insufficient granularity in the ONS data.

C.25 The GVA data in our analysis is based on multiple sources (e.g. Network Rail data is different from train operator data) and for this reason we have avoided showing a single aggregate GVA figure for the industry in our analysis.

Passenger and freight operator GVA

C.26 Our ORR GVA (oGVA) measure for train operators takes a representative proportion of the ONS transport GVA data. This proportion is estimated based on the more granular aGVA data (i.e. the value aGVA gives for the passenger and freight rail industry as a proportion of the Land Transport industry).

C.27 This is taken from the adjusted GVA figures for passenger rail transport from SIC Code 49.1 and freight rail transport from SIC Code 49.2. SIC stands for Standard Industrial Classification, and the codes are used to classify businesses according to their primary economic activity.

Network Rail GVA

C.28 Network Rail GVA has been approximated from the company's annual reports in a method also used in RIA's The Economic Contribution of UK Rail paper published in 2021.

C.29 This alternative method calculates GVA by adding together Network Rail's total employee costs plus capital depreciation.

This publication is available at orr.gov.uk

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