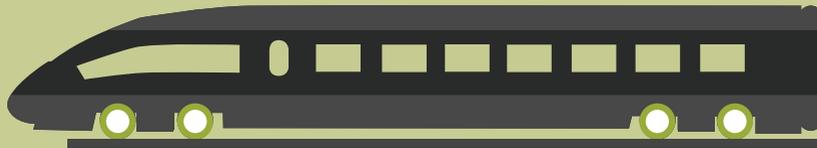


What is the contribution of rail to the UK economy?



What is the contribution of rail to the UK economy?

The rail industry and its supply chain:



Rail enhances the productive potential of the economy by up to

£11.3 billion PER YEAR

User benefits for passengers and freight from travelling on rail are up to:



The rail sector leads to benefits of up to:

£1.7 BILLION

from sharing of knowledge and technology due to firms locating in clusters near rail links



up to **£400m**

in increased output due to reduced transport costs

Rail delivers environmental benefits, reducing CO₂ by up to

7.7
MILLION TONNES

Rail leads to reduced road congestion, resulting in up to

£12.9 in travel time savings per year
BILLION



Rail is one of the safest ways to travel, preventing up to

865 serious casualties and fatalities per year

The change in industry model has increased the number of journeys by up to

380m in 2014

increasing the benefits of the rail sector by up to

32%



Summary of key points

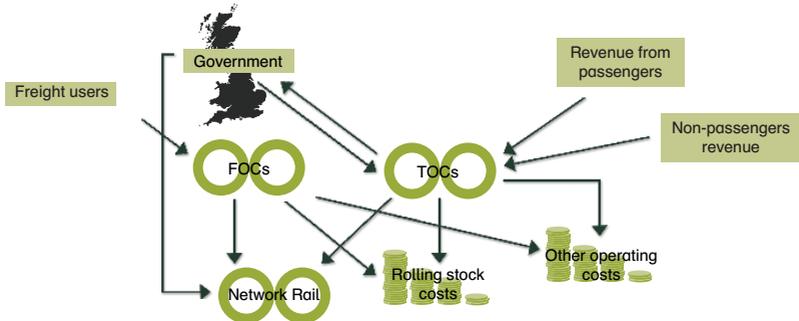
- Rail passenger and freight operators in Great Britain and their supply chain employ up to **216,000** people, contributing up to **£10.1bn** to the UK economy a year (measured in what economists term 'gross value added'). The rail sector also pays up to **£4bn** in tax to the Exchequer each year.¹
- The rail sector created benefits for rail passengers and freight users worth **£14.3bn** in 2014.
- Travel on rail instead of roads reduces road congestion and enables companies to locate closer to one another. These two benefits made the UK economy more productive by up to **£11.3bn** in 2014.
- It also reduces CO₂ emissions by up to **7.7m tonnes**, valued at **£460m** annually.
- Rail travel prevents up to **865** deaths or serious injuries from car and other road accidents in Great Britain a year, valued at **£308m** annually.
- Looking further afield, to other large European economies, the sector fared better during the recession in 2008 than its counterparts analysed in the study—despite the fact that the UK economy suffered the greatest fall in GDP among them. What's more, GB rail did better than it had done in previous recessions.
- The change in the structure of the rail industry in the mid-1990s appears to have increased the contribution of the rail sector to the UK economy by as much as **32%**.

Structure of the industry

The industry model changed in the mid-1990s from one of public ownership to the current model, where freight operating companies (FOCs) compete for freight contracts, and passenger services are largely specified by the government and delivered by train operating companies (TOCs). First Railtrack, and then Network Rail, have managed the rail infrastructure, with the Office of Rail and Road (ORR) regulating both bodies in turn.

These activities are supported by an extensive supply chain.

Flow of funds in the GB rail sector



Source: Office of Rail Regulation (2014), 'GB Rail Industry Financial Information, 2012-13', April.

This booklet updates Oxera's 2014 analysis of the contribution of the GB rail sector to the UK economy, commissioned by the Rail Delivery Group (RDG).² It provides an independent assessment of the role of the GB rail industry and its contribution to the economy.

Over the past 20 years, since the creation of the new industry model, the number of passenger journeys has risen, and as at 2015, stands at **115%** higher than it was 20 years ago.^{3,4} The distance travelled by trains has increased by **36%** over the same period, and there has been an improvement in safety and an increase in passenger satisfaction.⁵ There has also been a **70%** increase over this time period in the volume of freight transported by rail.⁶

In addition to the economic factors, the wider successes of the GB railways are discussed in the RDG document, 'Britain's Future, Britain's Railway'.⁷

Estimating the impact of the rail sector

The rail sector plays an important role in providing employment across Great Britain, both directly in the industry (through employment by TOCs, FOCs and Network Rail) and indirectly through the supply chain. In addition, as a key component of the transport infrastructure in Great Britain, the rail sector provides significant economic benefits by enabling other sectors of the economy to be more productive.

Oxera has examined the impact of the rail sector on the UK economy from different perspectives, including:



the employment, tax, investment and GVA generated by the sector (the 'economic footprint');



the benefits that accrue to passenger and freight users of the rail network from the consumption of the products and services of the rail sector (the 'user benefits');



the long-term effects of the sector on the wider economy—i.e. the benefits outside the rail sector (the 'wider economic impacts');



the environmental and social impacts of the sector.

It is important not to simply add together the first three perspectives outlined above, as there is overlap between them. While the economic footprint captures the impact of the sector on the economy in the short term, if the rail sector were smaller, the resources (labour, capital, land, etc.) currently used in providing rail services would be used elsewhere in the economy.

Nevertheless, this economic footprint provides an important guide to the size of the rail sector and its effects on the national economy.

We also provide analysis of:



the rail industry's performance in the recent recession compared with previous recessions, and relative to rail in other European countries;



the economic impacts that arose from the change in the industry model in the mid-1990s.



GVA and employment impact

Oxera has used data from Network Rail and the FOCs and TOCs, together with national accounts from the Office for National Statistics (ONS), to measure the employment and GVA created by the rail sector. The conclusions from this analysis are that:



the rail industry and its supply chain employ **216,000** people, which is similar to direct employment in the telecoms sector. There are **92,000** employees in the rail industry itself and **124,000** in the rail supply chain;



the rail industry and its supply chain generate **£10.1bn** of GVA a year, which is made up of **£6.3bn** of GVA in the rail industry itself and **£3.8bn** of GVA in the rail supply chain;



the rail industry and its supply chain generate **£4bn** of tax a year. This is made up of **£2.7bn** of tax receipts from the rail industry itself and **£1.4bn** of tax receipts in the rail supply chain.



User benefits

An alternative approach to looking at the economic footprint of the rail sector is to consider the benefits that accrue to passenger and freight users of rail services.⁸

To quantify the user benefits, it is necessary to specify a baseline—i.e. what would happen if the rail industry were smaller—and compare this to the existing rail sector. A baseline of ‘no rail sector’ provides valuable insights into the size of the sector in the economy, but is perhaps not a realistic option in assessing the impact of alternative policies. Therefore, Oxera has used a range of scenarios, in which passenger and freight volumes on the network are **10%, 50%** and **100%** lower (where 100% lower implies the absence of the rail sector).

These scenarios do not represent the outcomes from any particular policy choices, but instead illustrate the sorts of costs that might arise as a result of policies that have the effect of reducing rail traffic by these volumes. In reality, a **50%** decline in rail traffic would probably arise only if there were a major shock (or shocks) to the rail sector.

In practice, the volumes of passenger and freight traffic on the rail network might decline as a result of fewer rail links, an increase in price, an increase in journey time—due to fewer trains or lower frequency—or a reduction in the quality of the network (e.g. more crowded trains).

Oxera’s analysis shows that:



the user benefits of the rail sector are between **£1.4bn** (arising from a **10%** reduction in traffic) and **£14.3bn** (if there was no rail industry) for passengers (leisure, business and commuter) and freight users.



Wider economic impacts

The rail sector creates a more productive economy by alleviating congestion in the road network and facilitating the development of clusters of economic activity. This is one of the factors that makes transport different from many other sectors of the economy—if the rail sector were smaller, not only would there be a loss to the economy from the reduced economic footprint (which would be likely to be relatively short-lived as resources would be used elsewhere in the economy), but productivity in other sectors of the economy would also be likely to decline.

In assessing these effects, Oxera has used the same three scenarios as in the user benefits analysis. There are a number of channels through which the rail sector improves the long-run productive potential of the rest of the economy.



Reduced congestion on the road network: the existence of the rail sector means that fewer journeys are made by car, which reduces congestion on roads. Oxera's analysis indicates that the value of this reduced congestion is between **£0.9bn** (the 10% reduction in rail scenario) and **£12.9bn** (the 100% reduction in rail scenario) a year. Just over one-third of this comes from business users and freight, which has a direct effect on the UK's GDP.



Increased clustering benefits: rail services lead to an increase in the density of employment (i.e. the number of employees in a particular area, such as a city centre). This typically raises the productivity of these employees through information- and knowledge-sharing. Oxera estimates this to contribute between **£0.1bn** and **£1.7bn** to the UK economy each year.



Increased output: the rail sector reduces transport costs relative to making the same journey by road,⁹ which would result in an increase in output in other sectors of the economy. Oxera analysis suggests this is worth between **£40m** and **£400m** a year.

In addition to these channels, the rail sector may lead to increased productivity in the economy in other ways. For instance, the provision of rail services may enhance trade between firms. Oxera has calculated an alternative estimate of the rail sector's contribution to productivity considering the total impact without separating out the different channels. This alternative method suggests benefits of between **£1bn** and **£10.3bn** a year to the UK economy.¹⁰

Social and environmental impacts

The rail sector also provides environmental and social benefits to the UK, increasing journey quality, accessibility, air quality and resilience and reducing the number of accidents, greenhouse gas emissions and noise. Oxera has estimated the benefits of the rail industry on reducing accidents and greenhouse gas emissions.¹¹ For this we used the same scenarios as for the analysis of user benefits and the wider economic impacts. Overall, we conclude that:



the rail sector produces significant environmental benefits, saving between **0.7m** and **7.7m tonnes** of CO₂ emissions a year. This is valued at between **£40m** and **£460m** annually. The noise and air quality benefits provided by the rail sector have not been quantified;



the rail sector leads to a reduced number of serious or fatal accidents of between approximately **86** and **865** a year.¹² On the basis of reduced economic, medical and social cost these are valued at between **£31m** and **£308m** annually.



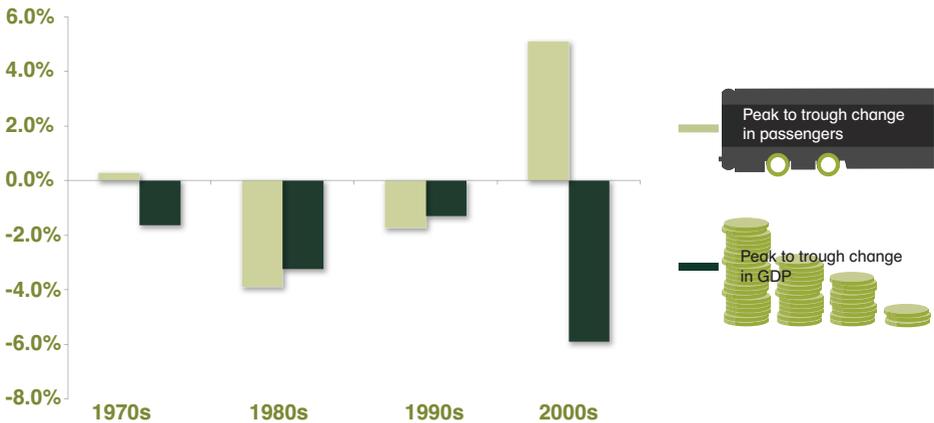
Performance in recession

Oxera has studied the performance of the GB rail sector during the recession using other European countries and previous recessions for comparison.

Passenger operations performed substantially better than might have been expected from previous recessions, and continued to exhibit strong growth for much of the recession, despite declines in GDP and employment. While this pattern has been seen across the comparator countries, passenger volumes in the UK have increased by more than in European comparator countries, despite the UK experiencing a more severe recession than other countries.

The relationship between passenger numbers and GDP changed in the last recession relative to previous recessions, with a large fall in GDP not reflected in a fall in passenger volumes, as shown.

Comparison with previous UK recessions: GDP and passenger (% change).¹³



Source: DfT and Datastream.

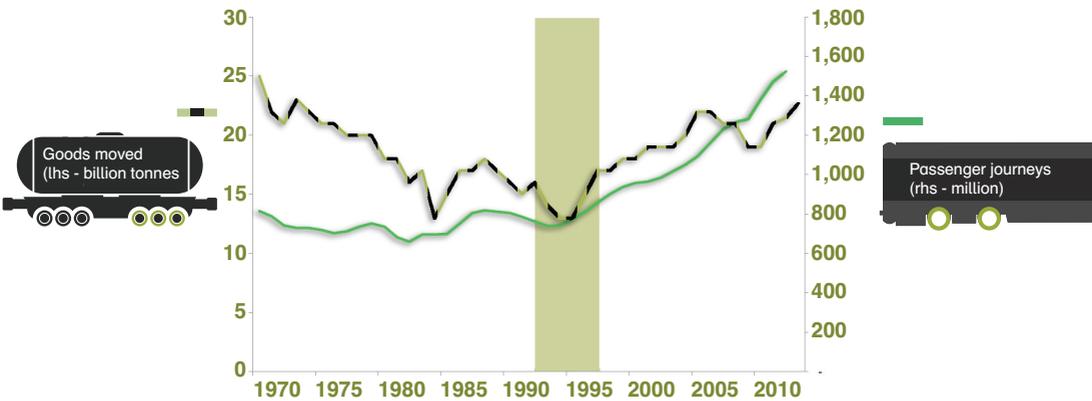
While freight operations saw volumes decline during the recent recession, they performed better than in previous recessions. While the recession in 2008 led to a **9.5%** decrease in the volume of freight transported, this was accompanied by a drop in GDP of **5.9%**. By contrast, in the 1980s the volume of freight dropped by **10%** following a contraction in GDP of just **3.2%**. In contrast to many other European countries, FOCs also maintained their market share relative to other forms of transport.

Change in the industry model

Prior to the mid-1990s, the rail industry in Great Britain was owned and run by the public sector. However, in the mid-1990s, the industry model changed to one in which the government specifies the passenger services to be delivered, and the TOCs provide these services, with the FOCs competing in an open market.¹⁴

The change in passenger rail journeys and rail freight in Great Britain since 1970/71 is illustrated below, and shows how the average growth increased following privatisation.

Passenger rail journeys and rail freight in Great Britain



Note: The shaded area indicates the period of industry transition as a result of the change in the industry model.

Source: ORR.

The important question is to what extent the change in the industry model caused this increase in average passenger growth (the change in ownership is best reflected in demand due to the effects of fare capping and efficiency improvements on ticket prices). To answer this, it is important to think about what would have happened to the rail sector in the absence of the change in industry model. Oxera considered a range of effects that cannot be attributed to the nature of the industry model, and thus suggests what effects the change itself might have had. Nevertheless, there is significant uncertainty about how the rail sector would have evolved but for the change in industry model, and these estimates are indicative rather than definitive.

For freight operations, there was a fall in freight volumes prior to the introduction of the new industry model (associated with the recession) and there have been significant changes since then. As a result it seems reasonable to attribute most of the change in trend in volumes to the change in the industry model.

The picture for passenger operations is more complex, given the much greater role of the government in specifying the services to be run, controlling the level of certain fares, and determining the amount of public investment. Therefore, Oxera has calculated the growth in passenger travel after the change and deducted any of this growth that can be explained by factors outside the control of the rail sector, such as the economic climate and car ownership.¹⁵

The difference between the increased growth rate and the changes outside the control of the sector is likely to be explained by a number of factors, including:

- aspects not adequately captured in the demand forecasting framework;
- the change in the industry model;
- changes that would have happened anyway had the new industry model not been introduced.

There have been some substantial changes in the rail industry since the change in the industry model, including:

- access to larger volumes of private sector capital (particularly investment in rolling stock);
- the establishment of five-year funding periods for Network Rail (and, importantly, a move away from annual expenditure limits). This has enabled continued government support to the industry—even when DfT funding was being reduced—in marked contrast to the pattern during the period when British Rail was in operation (i.e. before the change in the industry model);
- a change in the incentives on TOCs to grow the market and reduce costs where possible, with contractualised levels of funding for the duration of the franchise;
- increases in costs, offset by increases in government funding and revenue growth, which have enabled the average price per passenger mile to be held at a similar level since the change in the industry model;
- the availability of heavily discounted advance fares.

Quantifying the impact of the change in the industry model is very challenging. To reflect this, Oxera has considered a range of scenarios. After controlling for passenger growth caused by the factors outside of the control of the industry, we consider a range of **25–75%** of the increased growth in passenger demand around the mid-1990s being attributed to the change in the industry model. A qualitative assessment of the factors above—including access to multi-year funding agreements with government and private capital, and contractual incentives (such as TOCs being able to make additional profit by increasing patronage above that in the franchise agreement) to grow the market and improve passenger experience—suggests that the evidence would support a value towards the upper end of this range.

The results suggest for both passengers and freight traffic, that the change in industry model increased the impact of the rail sector by **10–32%** in 2014.



Conclusions

This analysis, produced by Oxera for the Rail Delivery Group, has:

-  estimated the economic contribution of the rail sector to the UK economy;
-  reviewed the performance of the sector in the recent recession relative to previous recessions and the rail sectors in other European countries;
-  quantified the benefits arising from the change in the industry model in the mid-1990s.

The economic contribution of the industry is split into three perspectives:

-  the contribution of the industry and its supply chain, which is the employment of approximately **216,000** people, the generation of **£10.1bn** in GVA each year, and the provision of **£4bn** of tax revenue to the Exchequer;
-  up to **£14.3bn** in benefits to passengers and freight users a year;
-  up to **£11.3bn** worth of additional productivity in the economy, which arises through the impact of the rail industry on other sectors of the economy.

The sector has performed better during the most recent recession than in previous recessions. While it is difficult to infer from the statistics that this is purely due to the change in the industry model, it seems likely that this change contributed to the improved performance.

In addition, using a set of plausible assumptions, the change in the industry model is thought to have delivered up to **380m** additional passenger journeys of a total of approximately **1.6bn** (or one in five journeys), and increased the economic benefits of the sector by up to **32%** in 2014, through higher passenger and freight volumes.

¹ All monetary values reported here are in 2014 prices.

² Available at: raildeliverygroup.com/publications.

³ Throughout this booklet, the 'rail industry' refers to the combination of passenger TOCs, FOCs and Network Rail. The 'rail sector' refers to the industry and its supply chain.

⁴ Office of Rail Regulation, National Rail Trends, 'Passenger journeys by year', available at: <http://dataportal.orr.gov.uk/displayreport/report/html/02136399-b0c5-4d91-a85e-c01f8a48e07e>.

⁵ Based on data from 1997/98 to 2012/13; for passenger satisfaction, the data is measured from 1999. Association of Train Operating Companies (2013), 'Passenger rail: dataset on financial performance, passenger benefits, and value of franchising model 1997/98-2011/12', 10 July.

⁶ Measured in net tonnes per km. KPMG (2014), 'Keeping the lights on and the traffic moving: Sustaining the benefits of rail freight for the UK economy'. The process for freight privatisation was different to that for passenger services.

⁷ Available at: <http://raildeliverygroup.com/what-we-do/publications.html?task=file.download&id=277>.

⁸ Technically, the consumer surplus.

⁹ For those journeys made by rail and accounting for the total (generalised) cost.

¹⁰ This would be instead of, not in addition to, the benefits estimated on the previous page.

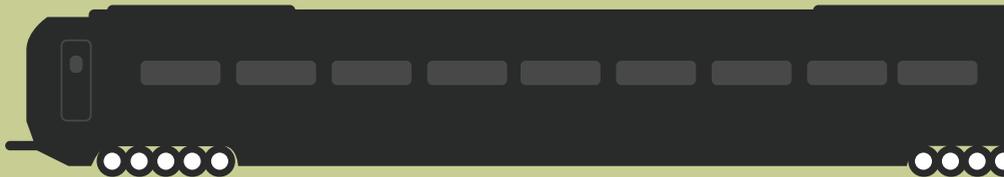
¹¹ These impacts are both commonly quantified in transport appraisal and can be readily quantified at the national level.

¹² We compare travel by rail with travel by road.

¹³ The periods over which these are calculated are as follows: 1973–75, 1979–81, 1990–91 and 2007–09. These are the periods between the peak and the trough of the economic cycle.

¹⁴ There have been a number of changes in the precise way in which the public sector specifies the passenger services that it wishes to procure.

¹⁵ Specifically, we have used parameters from the Passenger Demand Forecasting Handbook (PDFH) to calculate the impact on rail demand from changes in fuel costs for car users, changes in car ownership, GDP per capita, employment, and population growth over this period.



The Rail Delivery Group (RDG) was set up in 2011 to provide leadership to Britain's rail industry, bringing together the owners of Britain's passenger train operating companies, freight operators and Network Rail.

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