

A photograph of a green landscape with a train on tracks in the distance. The foreground is filled with tall, dry grass and green shrubs. In the middle ground, a white and yellow train is visible on a set of tracks that run horizontally across the frame. The background consists of rolling green hills under a clear sky.

BUILDING BACK BETTER:

The green case for
rail investment after
the pandemic



**HIGH SPEED
RAIL GROUP**

Rail Delivery Group



Executive summary

The COVID-19 pandemic has shifted realities, and there has been much discussion as to the long-term impact of the virus, and in particular how people's travel patterns will be affected.

We know that the rail network can bounce back. Passenger transport usage in the UK has increased relentlessly over the last two centuries, and rail travel demand has more than doubled since 1994.

Our railways have faced unprecedented challenges in the last six months, with the deliberate and necessary suppression of demand to reduce COVID-19 transmission. The future of all travel, especially for commuting, remains unclear. But with train operators having restored over 90% of services and ensuring conditions are as safe as possible, a return over time to pre-virus passenger levels is achievable.

Increasing railway patronage to pre-pandemic levels will be essential if we are to meet the Government's legal commitment of reaching net zero carbon emissions by 2050. With greater emphasis on the green agenda, rail now has the opportunity to become the sustainable travel mode of choice in the leisure and long-distance travel markets. A fully decarbonised rail system, including an electrified national high speed rail network, will deliver modal shift by taking passengers off planes, giving long-distance car travellers a better option and getting freight off roads.

In making the green case for rail investment, we are proposing:

- A national high speed rail spine, which builds on the sustainable credentials of the railway while also creating jobs across the nation;
- Investment in low carbon infrastructure which will support a long-term steady programme of electrification;
- More rail freight capacity to reduce carbon emissions and decongest the road network;
- Growing rail's market share in the domestic long-distance market by improving connections between Scotland and the north of England to the high speed network;
- A reformed, up to date fares and ticketing system to incentivise more passengers to use the network;
- A change in transport tax policy to create a level green playing field which reflects the environmental impact of the transport mode.



By implementing these recommendations, we can “build back better” and deliver a transport system for a net zero world.



Historic trends

- History demonstrates how transport demand “bounces back” following crises.
- Rail travel has been soaring for decades, and increased demand for sustainable travel will attract more passengers to low carbon modes like rail in the future.

Whilst we have never before seen a COVID-19 shutdown, the UK has experienced other crises of national significance, which should give us confidence that transport can and will bounce back after the pandemic.

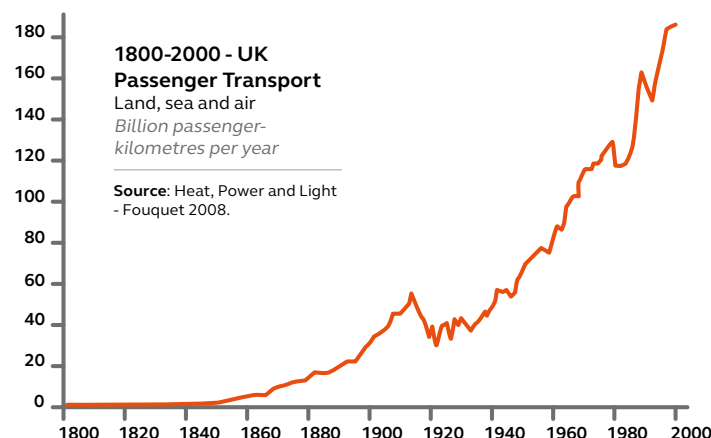
Following the Spanish flu, which killed between 20-50 million people over 1918-20 and during which the public were warned against rail travel, passengers felt confident returning to public transport and travelling on the railways. During

the interwar years, train travel boomed, in a period described as “the peak of railway eminence as the transport of choice”¹.

Internationally, following the 2003 SARS outbreak, travel and tourism growth to Asia picked up swiftly once the perceived threat of the virus diminished².

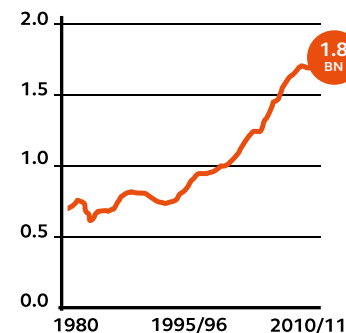
In a world of constant change, rising travel demand appears to be one of the few certainties.

Since the mid-1990s, UK train travel has soared irrespective of the economic climate and despite a fares system that can stymie rail’s ability to compete on long-distance routes, demand for travel by train continues to grow.



1. Leonard J Lickorish, 'British Tourism: The remarkable story of growth' (2012)

2. IATA Economics' Chart of the Week, 'What can we learn from past pandemic episodes?' (2020)



Rail passenger journeys in Great Britain, billions

Source: Department for Transport Rail Factsheet December 2019.

Before lockdown, train travel experienced a further resurgence with eco-minded passengers increasingly preferring it to air travel³. As we look to the COVID-19 recovery, the perceived health and safety benefits of private car usage will lessen and although cars could be decarbonised, the additional energy generation requirement for a 35 million-strong road vehicle fleet will come at a huge cost. With uncertainty on the best way forward for the road sector, rail electrification, and high speed rail in particular, can play a vital role in the decarbonisation of the transport sector as a whole.

Many of the technological solutions to rail network decarbonisation are already in existence or well developed, such as battery and hydrogen trains; and electrification remains the only feasible low-carbon option for higher speed, long-distance services. The most cost- and time-effective way to deliver electrification projects

is through a long-term steady programme of electrification and the UK can learn from successful international schemes such as those in Germany and Switzerland⁴. A tried and tested approach, electrification also provides wider environmental benefits through reduced noise and air pollution, as well as additional customer benefits such as reduced journey times and better performance and reliability.

Freight customers too are more and more concerned about the carbon footprint of their supply chain, and many are looking to increase their usage of rail freight - with the extra capacity created by High Speed 2 (HS2) helping to accommodate this ambition. With each tonne of rail freight producing 76% lower emissions than the equivalent transported by road, the single quickest way to reduce emissions in the freight sector is to unlock modal shift from our roads to the rail network⁵.

4. Railway Industry Association, 'Electrification Cost Challenge' (2019)

3. Rail Technology Magazine, 'Virgin Trains set passenger record for choosing rail over air' (2019)

5. RDG, 'Rail Freight - Working for Britain' (2019)

Journeys of the future

- Reform of the current fares and ticket system is essential to encourage the public to use rail as their mode of choice.
- The post-pandemic rail network is set to have greater emphasis on leisure and longer-distance travel, along with essential travel – a role to which rail is ideally suited.
- The rail sector needs continued high levels of investment so it can be the greener, more cost-effective mode of choice. Government should consider creating a “green level playing field” of taxes and support, across different transport modes.

The pandemic saw government instruct people to cease using the UK’s rail network for all but essential travel. Initially, there was a huge decline in passengers on the network and numbers hit just 4% of usual levels⁶. However, these figures have been gradually increasing and on some routes passenger numbers have recently risen to over 40% of pre-lockdown levels.

RDG research suggests that 59% of people do not envisage changing their travel habits when travelling by train after the pandemic. Data shows that 30% will take the train less frequently, whereas 11% plan to take the train more often⁷.

Commuters are most likely to reduce travelling by train⁸, with additional data from Transport Focus suggesting that 49% of people expect to work from home more often in the future⁹.

On top of passengers becoming more price sensitive due to the impact of COVID-19, the complexity of the existing fares structure which has over 55,000 separate fares, can further deter people from using the railway. Reform of the current fares and ticket system is therefore essential to encourage the public to choose rail when they plan to travel.

The likely direction of future demand for leisure travel is different. This is significant as leisure travel makes up the majority of distance travelled across the transport sector and could increase as working from home becomes more permanent. Given longer journeys are also responsible for the majority of carbon emissions, providing low carbon high speed rail for these trips through HS2 will be essential to reaching net zero.

6. Department for Transport, ‘Transport use by mode: Great Britain since 1 March 2020’, (2020)

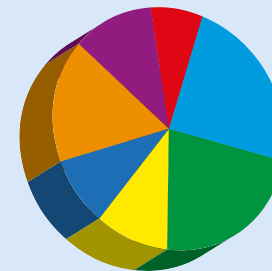
7. RDG, General Public Tracker results, (2020)

8. Ibid

9. Transport Focus, ‘Travel during Covid-19, Tracking research - Week 16’ (2020)

Leisure and visiting friends and family is responsible for over half of long-distance journeys

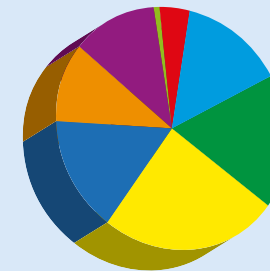
Note: Mileage share: by purpose (domestic journeys over 50 miles). **Source:** Analysis of National Travel Survey data (2015-2017) by ITS, University of Leeds.



- 11.4% - Other Non-Leisure
- 16.7% - Business
- 9% - Commuting For Education
- 9.9% - Other Leisure
- 22.6% - Visiting Family/Friends
- 23.1% - Holiday
- 7.3% - Day Trip

Almost half of surface transport emissions come from trips over 15 miles, whilst nearly a quarter of emissions from 50+ mile trips

Note: Mileage share: by journey distance. **Source:** Carbon Pathways Analysis. Informing Development of Carbon Reduction Strategy for the Transport Sector (Department for Transport, 2008).



- 12% - Over 100
- 11% - 50 to 100
- 15% - 25 to 50
- 25% - 10 to 25
- 18% - 5 to 10
- 14% - 2 to 5
- 4% - 1 to 2
- 1% - up to 1

Whatever challenges rail has faced, the aviation sector has been heavily affected by the pandemic, with the domestic flight network hit hard. With much emphasis being placed on a “green” recovery, rail is consequently well-placed to become the mode of choice for long-distance travel across Britain.

This growth for rail in long-distance travel need not be just domestic. HSRG has proposed considering “subsidies to kick-start new international services such as sleepers”¹⁰. France has made its COVID-19 support package for AirFrance conditional on the airline ending competition with TGV services¹¹, whilst RDG has proposed a change in transport tax policy to “create a level green playing field” so that levies reflect the carbon impact of a mode of transport¹².

10. HSRG, ‘High Speed Rail Group’s Response to Decarbonising Transport: Setting the Challenge’ (2020)

11. TGV: France’s intercity high-speed rail service

12. RDG, ‘Rail Delivery Group’s Response to Decarbonising Transport: Setting the Challenge’ (2020)

A greener way to travel

- Rail is already a low carbon transport mode and accounts for just 1.4% of the UK's domestic transport emissions¹³.
- Rail can be fully decarbonised by 2050.
- HS2 will be a key driver in delivering modal shift to rail by offering carbon, capacity and journey time savings that will take passengers off planes, out of cars and freight off roads.

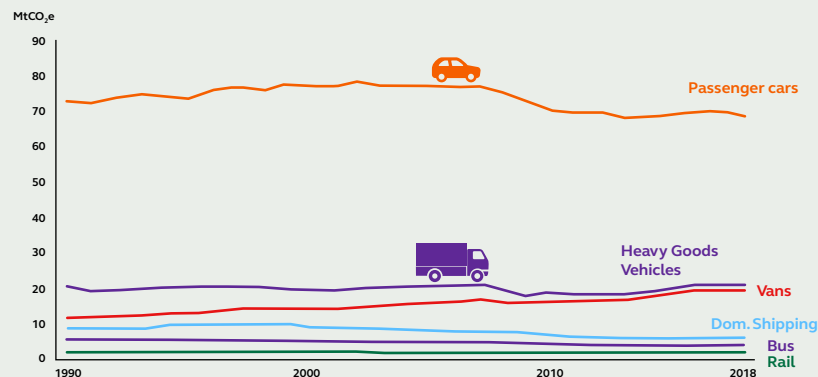
Large numbers of people want the environmental gains of recent months to be entrenched and there is now a unique opportunity to “build back better”, using the enormously disruptive and tragic experience of the pandemic as an

opportunity for positive long-lasting change. Polling from YouGov shows that across Europe, two in three people do not want to go back to pre-pandemic pollution levels, a fifth of people will cycle more, and a third will walk more¹⁴.

13. Department for Transport, 'Decarbonising Transport: Setting the Challenge' (2020)

14. YouGov, 'No going back: European public opinion on air pollution in the Covid-19 era' (2020)

UK domestic transport greenhouse gas emissions
from selected sources, 1990 to 2018



The UK has set itself a legally binding target of reducing carbon emissions to net zero by 2050, and rail travel will be crucial to realising this. As a mode, rail has lower emissions than most other forms of transport. Even with electrical power generation only partially decarbonised, high speed rail has emissions per passenger-km that are only 12% of those incurred by private car use, and 5% of air travel¹⁵.

In addition to the benefits of reducing emissions from passenger transport, HS2 will create capacity for up to 20 extra daily West Coast Main Line freight paths. With each freight train removing up to 76 HGVs from the road network, the environmental benefits will be huge.

The right investment in the UK's rail network will also help rebalance the economy. HS2 alone will be responsible for tens of thousands of direct jobs, for training a new generation of apprentices, making Britain a world leader in high speed rail technologies and building regional economies that have otherwise been left behind¹⁶.

It is estimated that during construction HS2 will create 30,000 jobs, 70% of which will be outside of London¹⁷.









15. David Higgins, 'Rebalancing Britain: From HS2 Towards a National Transport Strategy' (2014)

16. The Northern Powerhouse Partnership, 'HS2 and the Economy of the North' (2019)

17. HS2 Ltd, 'Our story and key facts' (2019)

Conclusion | Investing in a healthier, greener future

Eurostar vs plane: carbon emissions per passenger journey¹⁸

LONDON /PARIS	LONDON /BRUSSELS	LONDON /AMSTERDAM
 64.2kgCO ₂ e  4.1kgCO ₂ e	 59.7kgCO ₂ e  5.8kgCO ₂ e	 63.3kgCO ₂ e  10.7kgCO ₂ e
-90% Carbon emissions by Eurostar	-90% Carbon emissions by Eurostar	-80% Carbon emissions by Eurostar

There has already been one very clear instance of high speed rail displacing carbon-heavy flights. High Speed 1 (HS1) has been enormously successful as a clean transport solution, cutting the equivalent of 60,000 short-haul flights and saving 750,000 tonnes of CO₂¹⁹. With journeys between London and Paris now just over two hours, the aviation market for this route has dropped. The value of extending support to a national high speed rail network is clear. Flights from Scotland to London are the biggest market of domestic aviation routes in the UK, and there are huge environmental benefits to be made by replacing these with proper connections into the HS2 network²⁰.

Were HS1 and the Channel Tunnel to be further connected into the many kilometres of mainland Europe's high speed rail network, the impact in reducing short haul flights could be increased further still.

Looking at greenhouse gas emissions, rail is a much cleaner mode of transport than road or aviation, but there remains a need to eliminate diesel from approximately 60% of the rail network which is not yet electrified. A rail network that is largely electrified would be more efficient in terms of whole-life energy consumption and carbon emissions than road-based alternatives.

COVID-19 will impact us all for some time to come. But past experience shows us that transport demand can recover and there will be a desire to return to accustomed levels of travel. To make this transport future as green as possible, the case for continued rail investment during and after the pandemic has never been stronger.

The UK has set itself a legally binding target of 2050 to reach net zero. Only by delivering a full high speed rail network can the UK benefit from modal shift of people and goods away from carbon-heavy forms of transport, but HS2 alone is not enough.

The UK needs to commit to delivering the necessary infrastructure now, and support a long-term steady programme of electrification, to develop an integrated transport network with minimal dependence on fossil fuel-

based car, van and lorry use, or on domestic aviation. It is vital that HS2 is complemented by other rail infrastructure programmes across the Midlands, north of England and Scotland to improve rail connectivity and unlock the economic potential of the nation.

Investment in green rail infrastructure should be supplemented by a reformed fares structure which encourages passengers to travel by rail as a low-carbon mode, accompanied by a transport tax policy system which reflects the environmental impact of different transport modes and creates a level green playing field.

With its green track record and as the here-and-now clean solution to long-distance travel, continued high levels of investment is essential for rail to reach its full potential and for unlocking low carbon transport across the UK.

¹⁸ Eurostar, 'Tread lightly 10 point plan' (2020)

¹⁹ HS1, 'Delivering for Britain and beyond: The economic impact of HS1' (2020)

²⁰ HSRG, 'High-Speed Rail and Scotland' (HSRG, 2020)



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