



HS2 – A Giant Step or an Expensive Mistake?

Introduction

On 11 February 2020, a final agreement was made by the UK government that HS2 – a proposed high-speed rail link between London, Birmingham, Manchester, and Leeds – should be built. Disagreement about the proposal had lasted for over ten years, from the first plans submitted by the Labour Government in 2010, through four General Elections and several local and national reviews, to a final decision by the recently elected Conservative government.

Yet, the conflicts that HS2 proposals have generated over ten years have not disappeared. In some parts of the UK, they have even intensified, particularly in counties along its route such as Buckinghamshire. Local newspaper 'The Buckinghamshire Herald' reported on 11th February that:

- Conservative Prime Minister Johnson faced a rebellion from up to 60 of his own MPs, who stood against the scheme because of its cost and the 'destruction of beauty spots in the home counties, including Aylesbury Vale'.
- Johnson's own Chancellor of the Exchequer at the time, Sajid Javed, stated that projects such as HS2 should be '*costed properly, delivered within that (cost) ... and everyone can see that with HS2 that hasn't been the case.*'
- Local Conservative MP, Rob Butler said that he was "*extremely disappointed ... by this decision, as I know people will be throughout the Aylesbury constituency ... I believe there are better alternatives and ... regret that the government doesn't agree. I share their concerns over the eye-watering cost of the project.*'

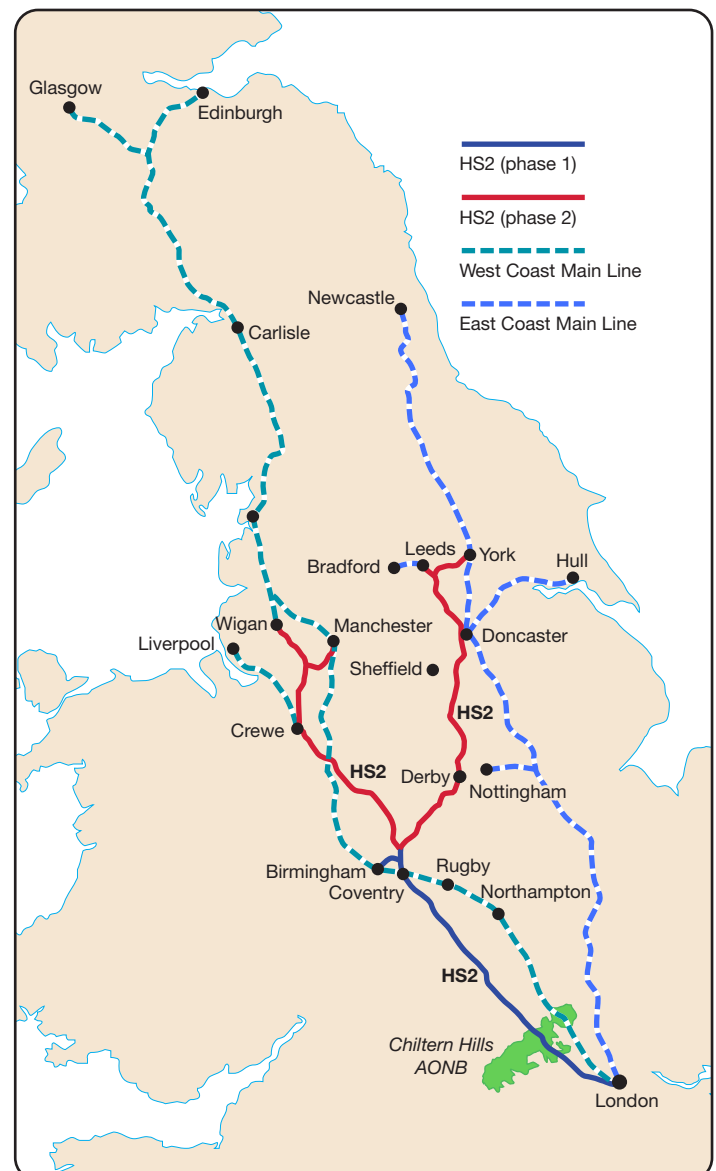
What has made people – within and outside government – feel so strongly as to speak out against this decision, even from within the party of government that made it? As is often the case, the argument is a straightforward one to geographers – between local concern for the environment on one hand, and economic cost and a perceived need to update national infrastructure on the other.

What is 'HS2'?

HS2 refers to 'High Speed 2', the second high-speed rail link in the UK after HS1 between London and Paris/Brussels. Unlike some Western European countries, such as France, the UK high-speed network operates mostly on conventional rail track, constructed during the second half of the 19th century, and subsequently upgraded for higher-speed working. In contrast to conventional track, High-Speed rail consists of dedicated track, completely separate from the mainline, with high-specification

engineering, fewer stations, and fewer points (where tracks cross over) or junctions (where different lines split). Trains would run at up to 400 kilometres per hour (kmh) or 250 miles per hour (mph), compared to current conventional high-speed trains which run at up to 200kmh (125mph). The full details of HS2 and its impacts on journey times are shown in **Figure 1** and **Table 1**.

Figure 1 The proposed route for HS2



Route:

- **Phase 1** A new high-speed link between London Euston and Birmingham Curzon Street, via the Chiltern Hills and an interchange station at Solihull.
- **Phase 2** Secondary spurs will lead NW to Manchester and Manchester Airport (**Phase 2a**), and NE to Leeds, via an East Midlands station at Toton (**Phase 2b**).
- Spur feeder lines will be constructed to take the line into city centres such as Liverpool, Sheffield and Nottingham.

Benefits:

- When complete, HS2 will impact upon journey times, shown in **Table 1**.
- 15,000 construction jobs will result over a 15-20 year period.

Source of Conflict:

- The line passes through Areas of Outstanding Natural Beauty (AONB) in the Chiltern Hills, Buckinghamshire.

Schedule:

- Construction has begun at the site of Euston, Old Oak Common, Solihull and Birmingham stations.
- London-Birmingham (**Phase 1**) opens in 2032-33, and **Phase 2** Manchester and Leeds by 2035-40.

Cost:

- Originally £32 billion, revised in 2015 to £56 billion, and in 2020 estimated at £106 billion. For example, land values in London have increased the cost of land purchase alone from £1 billion to £5 billion.

However, journeys made vary – rail users are particularly urban as 2017 data from the UK Department for Transport reveal (**Table 2**).

Road freight has also increased since the 1950s, from a time when rail moved half of all freight, compared to 2018 when two-thirds of all freight moved by road.

Table 2 Percentage of trips by mode and settlement type

	Walk & Bicycle	Car	Bus	London Underground	Surface Rail	Other
Urban Conurbation	26%	55%	10%	3%	4%	3%
Urban City and Town	27%	65%	4%	0%	1%	2%
Rural Town and Fringe	24%	69%	3%	0%	1%	2%
Rural Village, Hamlet and Isolated Dwelling	15%	80%	2%	0%	1%	2%

In spite of the shift to road transport, investment in road infrastructure has failed to keep pace with both vehicle ownership and journeys made by road. Consequently, the UK now has many highly-congested roads, particularly in its towns, cities and motorways during working hours, and along the main arteries to tourist hotspots such as the Lake District, or Devon and Cornwall.

The economic and environmental impacts of road traffic are considerable. A government report in 2008 showed that traffic congestion damaged the UK economy, with congestion costing £22 billion each year in lost time at work. In the environment, vehicle emissions are the largest source of air pollutants, such as carbon monoxide, carbon dioxide, hydrocarbons, nitrogen oxide, and particulate matter.

The background to HS2

The HS2 proposal reverses government policies since the end of World War 2, during which time, road building and improvement have dominated.

Since the opening of the M1 (the UK’s first stretch of motorway) in 1958, the number of licensed road vehicles increased from 4.4 million to just over 38 million in 2019.

In the 1950s, 25 percent of passenger distances travelled were by car, 42 percent by bus or coach and 18 percent by rail.

By 2010, 85 percent of distances travelled were by car, 6 percent by bus or coach and 6 percent by rail.

Turning to Rail Travel

With road congestion, demand for rail travel has increased considerably. To meet increased demand, increased service frequency means that the UK rail network is now nearing capacity, passenger numbers having risen steadily during the 21st century. Since 2000, electrification projects have reduced carbon emissions on UK railways, with major upgrades to the West Coast Main Line (WCML) between London, Birmingham, Manchester and Glasgow, and more recently Great Western Railway’s lines to Bristol and South Wales. Electric trains are quicker on acceleration, lighter (thereby consuming less energy), and faster overall.

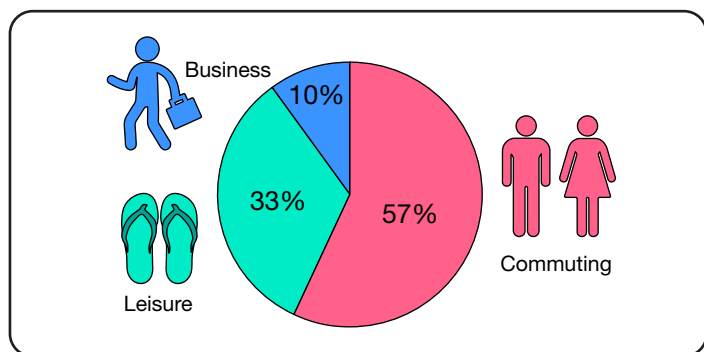
Table 1 Journey times before and after HS2. Because HS2 would serve only a small number of destinations, existing lines would form part of many High Speed 2 journeys for some years, e.g. to Scotland.

London to/from	Current journeys on existing lines (2020)	Proposed journey times (after Phase 2)	Time saved
Birmingham	1 hour 22 mins (to New Street)	49 minutes (to Curzon Street)	35 mins
Crewe	1 hour 30 mins	55 mins	35 mins
Manchester	2 hours 7 mins	1 hour 7 mins	1 hour
Liverpool	2 hours 14 mins	1 hour 33 mins	41 mins
Leeds	2 hours 11 mins	1 hour 21 mins	50 mins
Sheffield	2 hours 1 min	1 hours 25 mins	36 mins

Rail travel is nonetheless made for selective reasons by selective groups. Department for Transport data in 2017 showed that:

- Over half of journeys are for commuting to work, and a third for leisure purposes (see **Figure 2**)
- Only 10% of the market is business travel, yet it is this sector which is used to support arguments for HS2.
- Rail travel is most used by men aged 21-49, and by higher income earners in professional or managerial occupations.

Figure 2 Rail travel usage in 2017



Source: Gov.UK

The case for HS2

- Supporters of HS2 argue that the UK’s rail network is well behind its European neighbours; the UK has 70 miles of high-speed track, compared to France (1185 miles), Spain (1285) and Germany (800).
- The current rail system has its limits; only massive investment in track (e.g. doubling from 2- to 4-track across significant parts of the UK) would increase capacity by increasing the number of trains, as well as speeding them up by improving signalling. The disruption to travel would be significant for long periods.
- The West Coast Main Line (WCML) is the busiest rail route in Britain and is the UK’s most densely populated inter-city line in terms of population served. The line is winding along several sections, has several junctions, and is unsuitable for speeds above 225 kmh. Rather than undergo lengthy upgrades over many years, it would be cheaper to build a new line. The last upgrade to the WCML, completed in 2008, led to such increased demand that it reached capacity within ten years. New capacity is needed.
- Road-building is also costly. In 2011, the UK Highways agency estimated that the cost of building new motorways was an estimated £30 million per mile, three times more than a conventional two-lane road. That figure increases markedly within cities. The issue is clouded because the UK does not charge tolls along motorways (with the exception of a short stretch of the M6). Although £100 billion would buy a lot of motorways, governments see rail as an investment with a financial return, because rail companies pay to use it.
- Environmental objections to further road improvements and motorway building would add considerable costs to any project. In the early 1990s, protesters delayed building a new stretch of the M3 in Hampshire because of its historic and environmental interest. By contrast, environmental lobbyists regard travel by rail as essential to reduced CO₂ emissions.

A number of organisations support the HS2 project or the development of a high-speed rail network in the UK more

generally. These include business owners, the owners of regional airports (such as Birmingham) who believe that ease of access out of London will increase air travellers willing to fly from regional airports, and those such as Greengauge 21, a research company, who wish to extend HS2 into a 900-mile network (like the French TGV model) of high-speed rail linking major cities of England, Scotland and Wales..

The case against HS2

There is strong opposition to HS2. Some of it is localised in places most impacted by the new line (see **Table 3**), but some national organisations oppose the need for high-speed rail generally, including:

- The HS2 Alliance. Originally formed in 2010 to oppose HS2. It now represents individuals, residents’ associations, and parish councils of places along the route, to campaign for reduced impacts on people and the environment, and to fight for appropriate compensation.
- Local councils along route, including the London Boroughs of Camden and Hillingdon, Buckinghamshire, Oxfordshire, Warwickshire, Northamptonshire, Leicestershire, Coventry, and Staffordshire. As an example of the reasons for their opposition, Coventry and Warwickshire councils believe that, because there are no intermediate stations between London and Birmingham, HS2 offers no benefits for them.
- Taxpayers Alliance, a right-wing pressure group which regards HS2 as a costly waste of money.
- The Action Green Party, which supports HS2 in principle on environmental grounds, but believes that speeds should be restricted to 320 km/h to reduce emissions, and therefore accommodate more trains.
- The Campaign to Protect Rural England (CPRE) believes that journey time improvements are slight, given the cost, and supports instead a line to run alongside existing motorways and railways, reducing impact upon the countryside.
- Wildlife Trusts who estimate that HS2 will have major impacts on wildlife habitats, including five of international importance, as well as affecting 4 SSSIs and 50 nature sites. They declared that “no loss of biodiversity” was not an achievable aim.
- Woodland Trust who are guardians of our irreplaceable Ancient Woodlands. 108 would be destroyed partially or completely by HS2.

Table 3 A summary of the impacts of HS2

Places impacted	Nature of impact
London	Demolition of over 400 houses in London (mostly near Euston).
The Chilterns	Visual and noise impacts along the Colne Valley Regional Park plus parts of London’s green belt Visual impacts on countryside between Amersham and Stoke Mandeville. Re-alignment of 1km of the River Tame caused by construction of a viaduct 0.6 km long. A cutting through ancient woodland at Park Hall on the edge of Birmingham.
Rural areas between Buckinghamshire and Warwickshire	An estimated 21 300 homes will suffer an increase in rail noise, plus 200 community, education, healthcare, and social facilities.
Birmingham	Demolition of a student residence for Birmingham City University and 50 houses

What about carbon emissions?

Carbon emissions for transport are difficult to calculate. Air travel is the worst offender, generating more carbon than other modes of transport, but globally it accounts for only 1% of all emissions because it is the least-used form of transport. In terms of total volumes of carbon, cars are by far the greatest source of emissions. Persuading people to travel by rail rather than by car or planes must reduce emissions – or not? What if four people travel together by car? Or a train is near-empty? Calculating carbon emissions is at best complex.

The Energy Saving Trust (an independent organisation which promotes energy efficiency, low carbon transport and sustainable energy use) compared different forms of transport on a journey between London and Edinburgh. Their results are summarised in **Table 4**. Again, the data are difficult to summarise, because there are so many variables. Planes, on one hand, fly in nearly-direct lines, whereas rail and roads are routed towards cities or around hills. Some trains are electric while others run on diesel, some cars are more fuel-efficient than others, and short flights pollute more than long ones. The Trust did not include calculations for HS2 trains because the design of these and technology has not yet been decided. However, four people travelling together in a car – unless electric – would still not meet the carbon efficiency of travel by rail.

Table 4 Comparing carbon emissions by different forms of transport between London and Edinburgh. All the data refer to one person travelling alone

Travel by	Distance km	Average time taken (hours)	CO2 emissions kg/km	Total CO2 emissions (kg)
Plane	541	1 hr 25 mins	0.266	144
Train	631	4 hrs 42 mins	0.046	29
Car (diesel)	652	7 hrs 25 mins	0.177	115
Car (petrol)	652	7 hrs 25 mins	0.185	120
Car (electric) *	652	11 hrs 25 mins (includes 4 hours charging)	0	0

Source: Energy Saving Trust

HS2 – a cost or benefit?

HS2 is under way. The construction equipment can be seen in London, around Euston station, as well as several points along the route. However, the increase in cost of the project to over £100 billion has led many to ask – still – whether the money is worth spending. There are strong cost objections by those opposed to HS2, but wider questions are being posed, particularly in the post-COVID era.

- In the post-COVID era, will demand for travel be as great? The demand for HS2 is based on economic projections which may be flawed if economic recession persists long after the COVID era, particularly for high-speed services for which fare charges will be greater compared to conventional lines.
- The development of remote working and on-line meetings during COVID demands a huge re-think of forecasts of rail usage, especially for work.

- As enabling works take place and details of the route become apparent on the ground, the environmental costs are ever more evident, for example, at Calvert Jubilee, a nature reserve established in 1977 for the Queen’s Silver Jubilee. So-called mitigation strategies such as planting 75,000 new trees will fail to compensate for the loss of habitat.
- With greater demand for travel, are new roads needed, rather than rail? Or are more conventional rail links needed for daily commuting?
- Given the debate about carbon emissions and flying as a form of transport, why not route HS2 through London’s Heathrow Airport, giving direct connections to major UK cities, and reduce internal flights to Heathrow from domestic airports such as Manchester or Glasgow?
- Would the same money be better invested improving conventional rail links within UK regions? For example, should at least some the money be spent in developing links between northern cities on an axis between Liverpool, Manchester, Leeds, Hull, Middlesbrough, and Newcastle – often referred to as the ‘Northern Powerhouse’.

Conclusion

HS2 feels like the sort of topic that people might still be debating in 2040 even if the extension to Leeds and Manchester was to be built. Here it could be seen as the lynchpin of the government’s ‘levelling up’ strategy. Has it come too far for work to be abandoned in post-COVID Britain on grounds of both environment and economics?

Further Reading and Research

For an overview of HS2:

The HS2 website – <https://www.hs2.org.uk>

- News updates on HS2 on BBC News – <https://www.bbc.co.uk/news/topics/cgdwvvpvk35zt/hs2>

For environmental impacts of HS2:

- The Wildlife Trusts (which oppose HS2) – <https://www.wildlifetrusts.org/hs2>
- British Wildlife February 2020 ‘What next for HS2’ P. Barkham
- The views of those in the Chilterns represented by the Chiltern Society – <https://chilternsociety.org.uk/hs2/>

For economic impacts of HS2:

- The government arguments for the economic benefits of HS2 – https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/3650/hs2-economic-case-appraisal-update.pdf

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