



Do we really need HS2?

Money might be better spent on other things

Chris Stokes, former Executive Director for the Strategic Rail Authority, puts forward a heretic's view on domestic high speed rail

The man and woman on the Clapham omnibus – and the politician in any party in the House of Commons – knows that Britain urgently needs High Speed Rail. We are a first world country, and everyone else has one, or is getting one – it is a necessary national status symbol, transforming travel, reducing carbon emissions, creating vitally needed capacity and driving economic regeneration. Fast, sleek, sexy trains will, if you believe some of the media, replace our existing slow, unreliable, third world service. High Speed rail is the only environmentally way to meet the ever increasing demand for transport in this crowded island.

But before we euphorically sign up to building High Speed 2, Government and indeed, the rail industry owes it to the country and the taxpayer to give the case proper scrutiny, particularly when unparalleled public spending cuts are on the way.

The start point is the HS2 report. Without reservation, the HS2 team have done an astonishing amount of work, to a very high quality, to an incredibly tight timescale. Their work on the route, although inevitably controversial for the communities affected, has produced a convincing solution in many (although not all) respects. The business case also represents the culmination of an immense

amount of analysis. But buried within it there are fundamental assumptions which, if not sustained, would have the impact of the iceberg on the Titanic.

Growth ever upward?

The business case is predicated on high, compound growth. HS2 Ltd forecast a 267% increase in demand for long distance travel on the West Coast main line and the HS2 route, by 2033. This is made up of:

- a 'background trend' increase of 133% by 2033 – or 3.4% per annum;
- an uplift of an extra 84% of entirely new trips plus extra modal shift of 25% from air and 25% from cars, generated by HS2;
- an increase of 44% in long distance car trips by 2033;
- a 178% increase in domestic air passengers by 2033.



High Speed 1: a Eurostar from St Pancras International to Paris Nord has emerged from the London tunnel and is seen traversing the short stretch of overground line at Rainham before entering the Thames tunnel at West Thurrock. Rainham c2c station is on the other side of the wall. Brian Morrison

Historically, this isn't unreasonable, as travel for many years grew strongly with Gross Domestic Product. But is this still happening? The Department for Transport's own data suggests not.

There has been strong growth in rail travel, but it is a growth in rail's share of a saturated market. Since 1995, rail has gone up (by 3.7% per annum) and coach and car have declined (by an average of 2.6% pa for private and long distance coach, and by 0.3% pa for car).

In short, we are travelling slightly less than we were in 1995, despite, for most of that period, strong economic growth. What has happened? Academics have yet to research this, but one hypothesis is that the internet and mobile technology have impacted on travel demand; or it may be that road congestion has discouraged car travel, with a transfer to rail. For some, international travel will have replaced domestic holiday trips. But this is now a sustained trend, and needs to be understood before the country commits billions of pounds to High Speed Rail.

But surely HSI has demonstrated the success of High Speed Rail? Well, no. Both Eurostar and Southeastern High Speed have an excellent reputation, but neither have met their growth forecasts:

Eurostar volumes remain way below original projections, and HSI domestic services have also

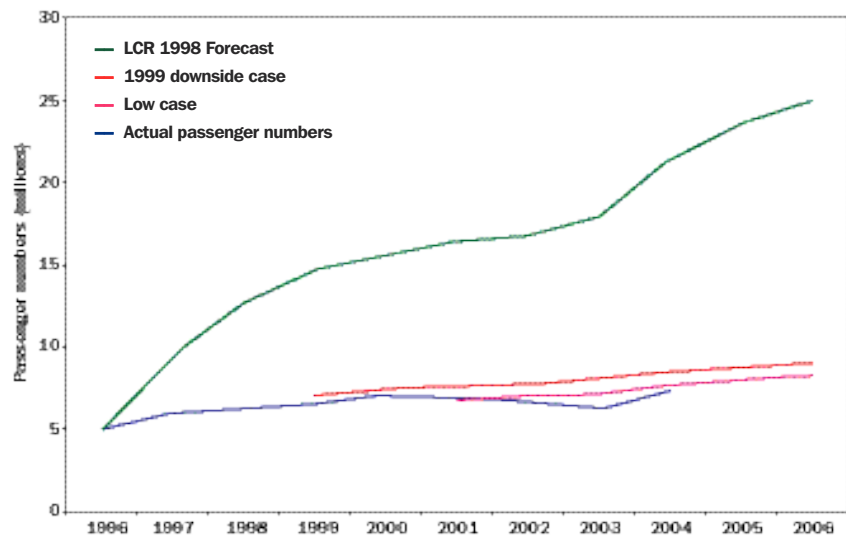
performed disappointingly. Stratford International is a grotesquely expensive white elephant, with no prospect of Eurostar calls at any point in the future. The Southeastern services stop, increasing journey times, but with minimal usage. The Ebbsfleet car parks are wide open spaces, with minimal off peak traffic.

Table 1: Travel trends, 1995 to 2008

	Miles per person			Annual average rate of change
	1995/97	2008	Change	
Walk / cycle	243	235	-8	-0.3%
Car / van / motorcycle	5,786	5,560	-226	-0.3%
Private coach	134	110	-24	-1.6%
Local bus / Underground	328	387	59	1.4%
Long distance coach	94	56	-38	-4.2%
Surface rail	321	495	174	3.7%
Air / ferry / light rail	75	80	5	0.5%
All modes	6,981	6,923	-58	-0.1%

Source: National Travel Survey 2008, Table 3.2

Fig 1: High Speed 1 passenger numbers



Source: C&AG's Reports (HC 302 of Session 2000/1, Fig. 6; HC 77 of Session 2005/6, Fig 8)

The number of Class 395s in daily use has been reduced, as planned two-unit formations are not needed for a number of peak services. If you live in the Medway towns, would you choose to take the High Speed train at a significant premium to take you to a generally less convenient terminal? Or would you continue to use the classic routes to Victoria or Cannon Street, for in most cases a quicker journey to your final destination, albeit a 10-minute longer station-to-station journey? Not surprisingly, Go-Ahead's 24 June Trading update states: '...this franchise became eligible for 80% revenue support from 1 April 2010, following the introduction of the High Speed services in December 2009. Recent National Passenger

Survey results showed that the high speed services are very popular with customers but economic conditions mean that revenue is below the bid assumption prepared in 2005'. So let us remember HS1 before we lull ourselves into believing that the planning for major schemes is bound to be right.

Economic regeneration

HS2's supporters argue that the project will pump prime economic growth in the regions. An equally credible alternative view is that it will make Britain even more London-centric than it already is. For example, will the West Midlands benefit from a kick start to its economy – or will it gradually become a satellite of London, the place where the back office jobs are located because it is cheaper and staff can be paid less?

The report forecasts the wider economic benefits at £3.6 billion – a big sum but only a modest part of the total forecast benefits of £32.3 billion. But the devil is in the detail: almost all of this is a benefit from increased conventional capacity. It derives from better regional and local services, mostly at the south end of the route, and reduced road congestion. So there are limited direct benefits for Birmingham and Manchester.

While there are major claimed time saving benefits for passengers, a report commissioned by HS2 from Imperial College, published within the mountain of material on the HS2 website, estimates the other wider economic benefits resulting from the reduced journey times on HS2 at only £8 million pa.

Might a better result for the North of England be delivered at much less cost by upgrading and electrifying the existing rail network? The Leeds North West electrification shows the growth that can be achieved by total route modernisation, but much of the network, particularly in the North



West, is still Pacer territory, with little use outside the peaks, and the Liverpool – Leeds – North East core route is still slow.

Environmental benefits

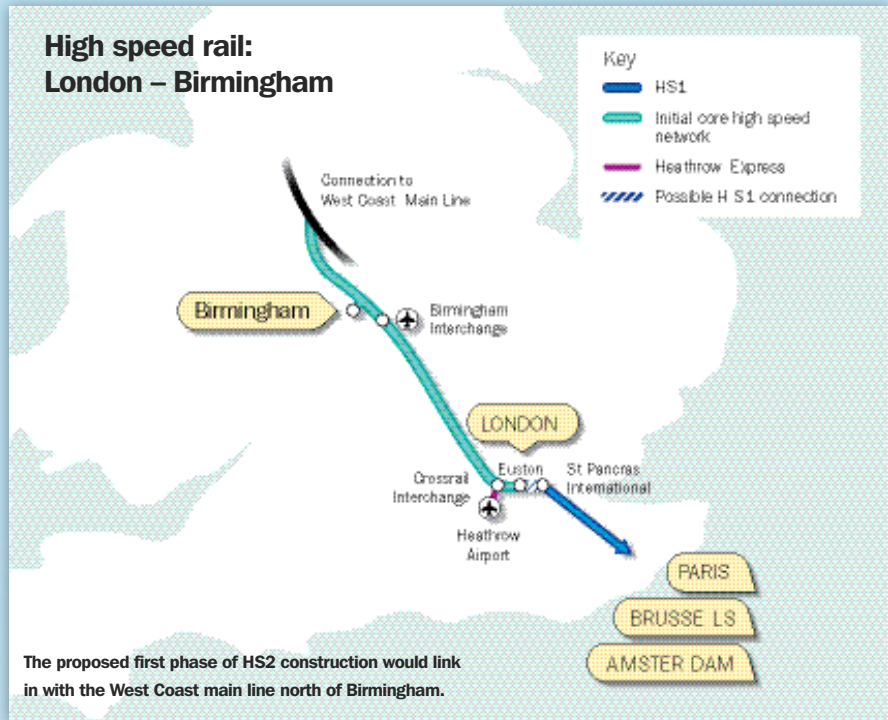
Again, our politicians ‘know’ that HS2 will produce major environmental benefits, with a significant reduction in carbon emissions. But the HS2 team has done the analysis, and claims no more than carbon neutrality. At first glance, this feels counter-intuitive, but it is easy to explain in qualitative terms.

On the benefits side, transfer from air produces a benefit, but this is limited unless and until High Speed goes all the way to Scotland – rail already has 80% of the rail/air market from Manchester to London, and what is left is mostly interlining.

In opposition, the Conservatives argued strongly that High Speed was an alternative to expansion of Heathrow. The facts don’t support this, and indeed Lord Mawhinney’s recent report (p8, last month) argued against the immediate construction of a link to Heathrow from HS2. Domestic air traffic at Heathrow has been declining (from 7.4million in 2000 to 5.6million in 2008), and now makes up only 11% of the total passenger numbers through the airport. There are now only five mainland domestic routes, to Manchester, Newcastle, Glasgow, Edinburgh and Aberdeen, and the initial HS2 route will make little impact on any of these.

Transfer from road produces some ‘green’ benefit, although the gap with rail has been dropping sharply as cars become more fuel efficient, and will shrink further if and when electric cars come into widespread use for longer distance journeys.

On the other side of the equation, faster trains sharply increase carbon emissions for existing rail passengers, and additional



‘generated’ traffic is all negative. Also, there are of course significant carbon costs during construction.

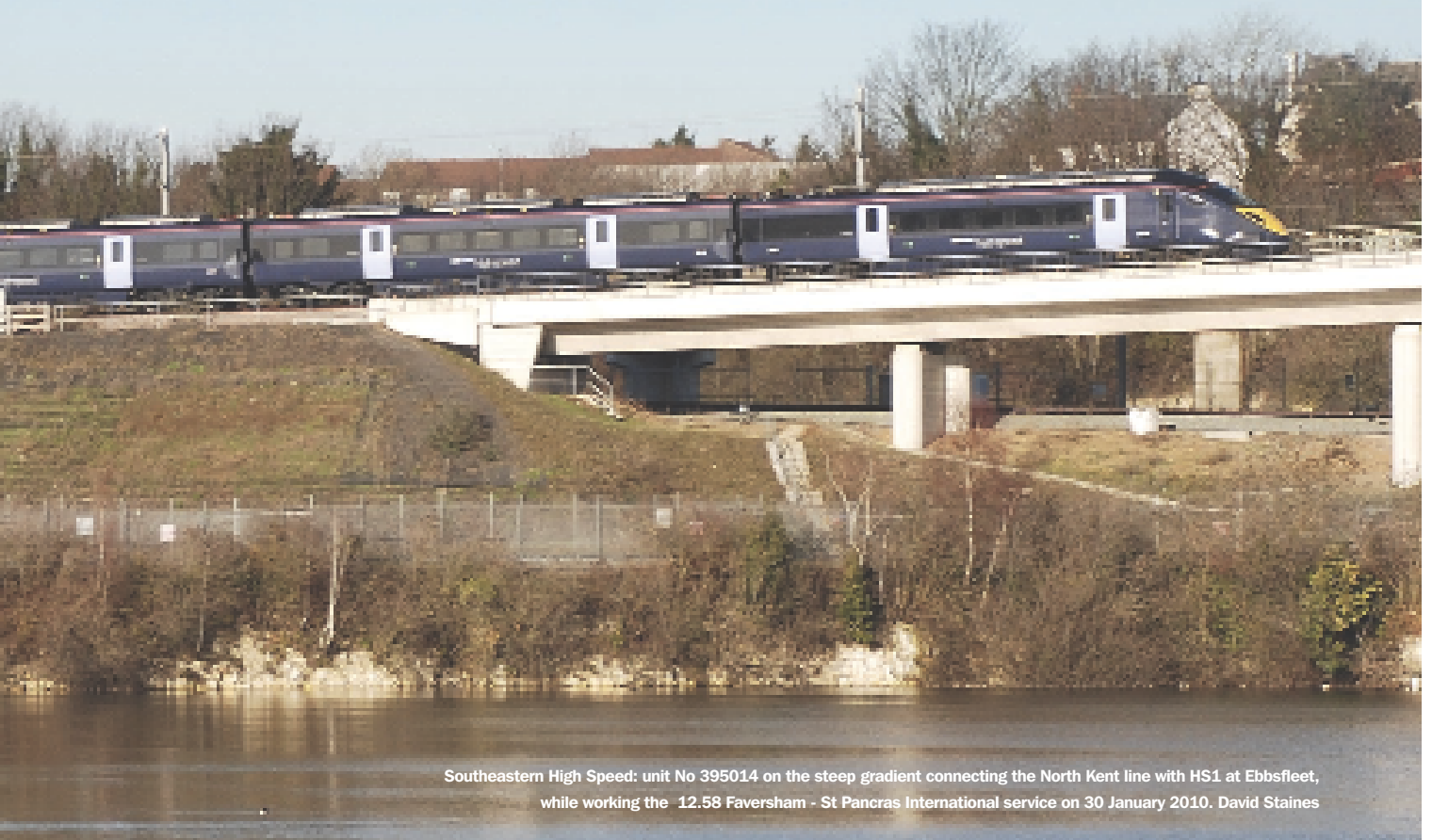
Overall, of course, the best policy to reduce carbon emissions would be to incentivise people to travel less!

‘Replacing a Third World railway’

Most *Modern Railways* readers will know very well that much of Britain’s network is far from third world, with high speeds, high frequency and, recently, increasingly respectable operational performance. We do not match some of the end-to-end speeds on other

countries’ high speed networks, although we do manage 100mph start-to-stop timings on three routes (the East and West Coast main lines and HS1 domestic), and there are some surprising comparisons: for example my local station (Leighton Buzzard) has an hourly non-stop service from London at an average of 83mph (29 minutes for 40.25 miles). In contrast, Tokyo to Oyama (50 miles) on the Tohoku Shinkansen averages 68mph.

More importantly, because inter-city services from London are already generally good and distances are relatively short, High Speed does not have the potential to produce the step



Southeastern High Speed: unit No 395014 on the steep gradient connecting the North Kent line with HS1 at Ebbsfleet, while working the 12.58 Faversham - St Pancras International service on 30 January 2010. David Staines



change that has been achieved, for example, in France and Japan. Elsewhere, President Obama has announced high profile support for high speed rail: the only two high speed lines proposed as we would understand them are in Florida and California. Elsewhere, the current plans would only raise speeds to, say, those on the Midland main line, lower in many cases.

There are, of course, many cross-country and regional routes for which significant improvements in terms of journey times, rolling stock and frequency would be highly desirable. Although these could be achieved at

a fraction of the capital cost of HS2, there is no likelihood that they will be taken forward in the current public expenditure crisis – indeed it is likely that the second High Level Output Specification (HLOS2) will include no significant enhancements to the existing network.

But we need the capacity...

The proposed HS2 route provides a step change in capacity on the West Coast main line corridor, at least between London and the connection in the Lichfield area north of

Birmingham. But the through services to Manchester, Liverpool, the North West and Scotland will have to find their way through on the existing infrastructure – not entirely straightforward between, for example, Stoke and Manchester. The ‘classic’ route is already close to capacity between Euston and Milton Keynes, so if growth continues, demand would have to be crowded and/or priced off, or an alternative solution found.

The first step is to recognise the scale of the capacity uplift already in the pipeline. An 11-car Pendolino will have 150 extra standard

Path-eater? Class 350/2 Desiro No 350231 passes South Kenton on 5 April 2010, forming the 11.36 London Midland service from Tring to Euston. Brian Morrison





How will the future pan out for West Coast services from north of Birmingham? Pendolino No 390041 arrives at Runcorn station while working the 12.48 Liverpool to Euston service on 9 March 2009. Tony Miles



The Evergreen 3 project will speed up services on the Chiltern main line. Here unit No 168004 is seen passing Haddenham & Thame Parkway with the 12.24 Marylebone - Birmingham Snow Hill service on 1 March 2010. Roger Marks

class seats, an increase of 51% on the present capacity. It is also probable that one (possibly even two) first class vehicles could be converted to standard with minimal revenue loss, giving a further capacity increase. First class loadings are now generally depressingly low on West Coast, reflecting corporate cost saving in the recession and, more recently, Government restrictions on civil service first class travel. And many first class passengers are now travelling on advanced purchase fares, so if capacity is tight on a few trains, revenue can be broadly maintained by yield management.

So an increase of over 50% is achievable simply by lengthening all the existing trains, (although lengthening the whole Pendolino fleet was apparently not value for money!). In addition, the Evergreen 3 upgrade on Chiltern will provide an attractive alternative route to the West Midlands, taking only about 10 - 15 minutes longer, with scope for doubling or trebling its capacity with longer trains.

What more can be done? Fast line capacity at the south end of the route is constrained by operation of some slower Class 350 commuter trains. If these were replaced by units capable of the same performance as Pendolinos – the justification for the proposed use of Inter-city Express Programme (IEP) trains on the route – and if Ledburn Junction were grade separated, it would be potentially possible to increase peak

paths from 11 to 13 an hour in each direction, giving a further capacity increase of 15%.

Further north, the current bottleneck at Stafford could be relieved by constructing the proposed by-pass, and there are no doubt other smaller scale schemes which can be developed over the next five to ten years.

The HS2 documentation itself makes a similar case: 'Rail Package 2', one of the 'alternative interventions' evaluated as part of the overall HS2 work, provides almost the same capacity, with a net benefit to cost ratio of 3.63, against 2.7 for HS2 itself. And these are changes which can be taken forward incrementally, and can be implemented relatively quickly as growth emerges, rather than betting everything on the sort of growth forecasts which came unstuck on HS1.

A robust business case?

The first big point to understand is that the net benefit ratio for HS2 is not in fact that exciting, and all the risks are downside. The analysis is based on a 60-year project life from completion, which obviously has its own inherent risks – it would be a brave soul who forecasts what the world will look like in 2086.

The total investment is estimated at £17.8 billion, generating additional fare income of £15.1 billion, so it is nowhere close to having a conventional financial case. This is not unusual for major rail schemes, although there

are some exceptions, such as Chiltern's Evergreen 3 project, which will reduce journey times and increase capacity on the parallel route to the West Midlands on a commercial basis and at no cost to the taxpayer. In addition to the additional revenue, the benefits claimed include economic regeneration (discussed above), the benefits of reduced journey times and the creation of additional capacity.

The most obvious risk is that if the demand forecasts prove to be dramatically overstated, then all these benefits, including of course the increased revenue, are reduced proportionately. If demand growth is 'only' 134% – half the level projected by HS2, but far above the emerging results for Eurostar on HS1 – then the net benefit ratio is way below the threshold of 2.0 used recently by DfT as a cut-off point for further consideration of rail schemes.

More importantly, the biggest single benefit claimed by HS2 relates to reduced journey times, valued at £15 billion for HS2 users. Inevitably this gets technical. Buried within the detail are some pretty brave assumptions, for example the analysis assumes that 30% of passengers are travelling on business, at an implied very high average salary of £70,000 pa, also that travelling time is not productive or pleasurable. But recent research shows that this is not the case, and casual observation on any inter-city train supports this: many business travellers are working on lap-tops or reading

reports, positively benefiting from undisturbed 'quiet' time. This is how it is now: with advancing technology in the time to come, being on the train will hardly constitute being out of the office or living room.

The business case also assumes a Stalinist view both to pricing and to rail competition. The revenue projections assume a continuation of pricing at RPI + 1% until 2033. By then, prices would have increased by 27% above inflation, although the projected modal shift from air and road to rail is not apparently affected by this assumption. And the impact of potential competition from the classic routes has been completely ignored. Unless there is to be absolute, minute control of all fares on all routes on the West Coast corridor, this is an extraordinarily brave assumption.

Taking London to Birmingham as an example, there would certainly continue to be fast services on the classic West Coast route itself, to serve flows such as London – Coventry and London – Wolverhampton, and Watford and Milton Keynes to Birmingham. So will the operator on this route actually be constrained to charge the same fare as the HS2 operator from London to Birmingham? And will competition on the separate and upgraded Chiltern route be constrained too? If not, how much of the rail market will remain on existing routes, which would be cheaper and, for many people, more convenient: for example, Birmingham New Street is a much more convenient interchange for many journeys than

the new HS2 station would be. Is this an unnecessarily gloomy view? Not judging by the revealed preference for the classic route over HS1 in the Medway Towns.

So all the sensitivity tests point to greatly reduced revenues and benefits, and if the downside risks on passenger volumes are then factored in, the business case for HS2 evaporates like morning mist in summer. If we are brutally honest, this is similar to HS1 – a qualitative success, but an investment disaster.

The opportunity cost

Most Government department budgets are expected to be cut by 25% in the current spending review, with transport clearly not an exception. Spending cuts will impact on all of us, from reduced benefits to fewer police and ageing school buildings. There is an opportunity cost here, both in relation to other public services and rail itself.

While construction expenditure on HS2 will not start for at least five years, even before then the development costs will be considerable, and will undoubtedly represent an opportunity cost for the industry. Forget

smaller scale improvements, projects like East West Rail and additional rolling stock. Some cuts have already taken place, like the £50million 'Better Stations' fund and the uncommitted HLOS1 additional rolling stock, and HLOS2 is likely to be steady state at best, with the risk of route closures looming over the horizon. In this context, and given the downsides to the business case, HS2 potentially looks like a vanity project, and I would argue the case needs to be rigorously challenged.

The problem faced by heretics such as myself is that there is a prevailing myth that High Speed rail is a good idea for this country, with massive environmental and economic benefits. As John F. Kennedy once said 'The great enemy of the truth is very often not the lie – deliberate, contrived and dishonest – but the myth – persistent, persuasive, and unrealistic'.

chrisjstokes@bopenworld.com



Operators on parallel routes can be expected to attempt to siphon off traffic from HS2 through aggressive pricing. This Chiltern poster was photographed at Leamington Spa. Roger Marks



The 07.27 St Pancras International - Paris service powers up the Nashenden valley towards the North Downs tunnel on HS1 on 28 July 2010. David Staines