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Research Note 92
16 September 2011

The hidden costs of HS2

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While the business case for HS2 continues to unravel, this research note examines the hidden costs of the project. That includes both the costs of promises from Ministers, and the cost of other schemes which will be needed to make it work as advertised.

For a number of reasons costs may be higher:

- The present plans show that many towns and cities will get a worse service.[1] If that is not the case as Theresa Villiers has argued, then the saving in the business plan for reducing existing services would not be possible, costing £5.4 billion.
- Additional pressure on London Underground lines from Euston will make Crossrail 2 necessary, costing at least £10 billion.
- Mitigating the environmental effects of the line, for example by running portions of it underground is likely to add at least £3 billion to the cost.

And revenues may be lower:

- Demand is unlikely to match the Government's expectations, though we have not included a cost for this in our final calculations.
- Phillip Hammond has pledged that the increase in capacity will allow competition driving lower fares. But the business case is based on a 27 per cent over inflation rise in fares. If that does not take place revenue is likely to be at least £10 billion lower.
- The final result is that the cost to taxpayers alone will rise from £17.1 billion to a massive £45.5 billion.

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[1] This was exposed in earlier TaxPayers' Alliance research, available here: http://www.taxpayersalliance.com/hs2capacity.pdf

The published business case

The table below summarises the HS2 Limited and Department for Transport business case for HS2:[2]

Table 2 – **Quantified Benefits and Costs (£ billions) of the Y network (2009 PV/prices) and the resulting BCR**

(1)	Transport User Benefits	Business Other	£25.2 bn £13.1 bn
(2)	Other quantifiable benefits (excl. Carbon)		£0.4 bn
(3)	Loss to Government of indirect taxes		-£2.7 bn
(4)	Estimate of additional released capacity benefits facilitated by the Y network		£1.3 bn (£0 – £2.6 bn)
(5)	**Net Transport Benefits** = (1) + (2) + (3) + (4)		**£37.3 bn** (£36.0 bn – £38.7 bn)
(6)	Wider Economic Impacts (WEIs) (London – West Midlands only)		£4.0 bn
(7)	Estimate of Additional WEIs from the Y network		£2.3 bn (£0 – £4.7 bn)
(8)	**Net Benefits including WEIs** = (5) + (6) +(7)		**£43.7 bn** (£40.0 bn – £47.4 bn)
(9)	Capital costs		£30.4 bn
(10)	Operating costs		£17.0 bn
(11)	Estimate of additional classic line cost savings facilitated by the Y network		-£3.1 bn (£0 – -£6.1 bn)
(12)	**Total Costs** = (9) + (10) + (11)		**£44.3 bn** (£47.4 bn – £41.3 bn)
(13)	Revenues		£27.2 bn
(14)	**Net Costs to Government** = *(12) – (13)*		**£17.1 bn** (£20.2 bn – £14.1 bn)
(15)	BCR without WEIs = (5) / (14)		2.2 (1.8 – 2.7)
(16)	**BCR with WEIs** = (8) / (14)		**2.6** (2.0 – 3.4)

Source: HS2 Ltd

N.B. the numbers in brackets represent a range around the central numbers presented above them.

The evaluation of both revenues and benefits are significantly flawed, as shown by other critiques of the project.[3] But even on the basis of the Government's own analysis, the project represents poor value for money: the project will have a net cost to the taxpayer of £17.1 billion, with only 61 per cent of the total costs paid for by its users over a sixty year project life.

They do not set out a clear or convincing case for why long distance rail passengers, who are on average significantly wealthier than the population as a whole,[4] should be subsidised

[2] HS2 Limited, *Economic Case for HS2: The Y Network and London – West Midlands*, February 2011
[3] For the original business case, see: Stokes, C. *High Speed Rail*, TaxPayers' Alliance, 4 February 2011. For the more recent economic case, see: HS2 Action Alliance *Review of the February 2011 consultation business case for HS2*, 17 June 2011
[4] Stokes, C. *High Speed Rail*, TaxPayers' Alliance, 4 February 2011, pp. 14-15

to this extent. This approach is, rightly, not adopted in relation to air travel or long distance coach operation, and the taxation structure in relation to fuel duty is such that there is clearly no overall subsidy for the motorist.

Future demand

The Government forecasts that HS2 will see growth in the number of passengers of 216 per cent. But over-forecasting is endemic for major rail projects both in Britain and around the world. Research by Danish academics in 2006 found that "for nine out of ten rail projects, passenger forecasts are overestimated; average overestimation is 106%" [5]

Eurostar has captured most traffic between London and Paris, but the market is near saturation, and its passenger numbers in 2009 were 37 per cent of the forecast for 2006. Manchester to London can be expected to show a similar pattern. There has been rapid growth in passenger numbers since the dramatic service improvements in 2008, mostly at the expense of air. But this is a step change over three to four years, not a permanent trend. Rail is already dominant in the markets from Leeds and Birmingham to central London, so the Department's forecasts are only credible if there is evidence that there will be a step change growth in the demand for travel on these corridors, which has not happened for London to Paris.

When giving evidence on HS1, the Department told the Public Accounts Committee that they had learnt the lesson and "next time it considered undertaking a major transport project, it would factor more severe downside assumptions into its business case analysis".[6] But that does not appear to have been done for HS2.

In April 2010, the rating agency Fitch looked at high speed rail projects. Their report stated that:[7]

> *"Historically, the agency has observed that the assessment of rail demand has displayed a significant optimism bias, particularly for Greenfield projects*
>
> *[...]*
>
> *Rail projects are often high profile. This exposes them to "political entrepreneur syndrome" where the public authorities overestimate the benefits of the project to get it approved for the purpose of political gain"*

Any shortfall in demand from expected levels will increase the cost of the project to taxpayers. To be conservative though, this note assumes they are accurate.

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[5] Flyvbjerg, B., Skamris Holm, M. K. & Buhl, S. L. *How (In)accurate Are Demand Forecasts in Public Works Projects – The Case of Transportation*, Journal of the American Planning Association, Vol. 71, No. 2, Spring 2005
[6] Their report is available here: http://www.publications.parliament.uk/pa/cm200506/cmselect/cmpubacc/727/72705.htm
[7] Painvin, N., Kotecha, K. & George, C. *High Speed Rail Projects: Large, Varied and Complex*, Fitch Ratings, 6 April 2010

Experience in other countries

Ministers have argued that Britain must invest in high speed rail to keep pace with other countries. But the financial results of many high speed lines have also been poor, with schemes taken forward as Public Private Partnership projects, such as Taiwan and the Netherlands, facing bankruptcy. Reuters reported in February 2011 that:[8]

> *"The Dutch high-speed train operator could face eventual bankruptcy unless steps are taken to boost its viability, after little more than a year of full services, infrastructure minister Melanie Schultz van Haegen said."*

At a national level, Spain has invested proportionately more than any other country. That has certainly increased the country's debt, but it is less clear that it has helped to drive economic growth. The Telegraph has reported that:[9]

> *"The AVE route connecting the Castilla la Mancha capital Toledo with the cities of Albacete and Cuenca was inaugurated with much fanfare last December, one of the links that helped Spain overtake France as the country operating Europe's biggest high speed rail network.*
>
> *But Enrique Urkijo, the Director General for Passengers at Renfe, was forced to concede that the project had not been a success and that operating a "ghost train" was no longer feasible."*

Finally, plans for high speed rail in the United States have largely been cancelled as individual States have not wanted to take on the financial liability, even with the federal government meeting the upfront costs.

[8] Roumeliotis, G. Dutch high-speed rail faces financial woes – govt, *Reuters*, 1 February 2011
[9] Govan, F. Spain cuts high speed 'ghost train', *Daily Telegraph*, 28 June 2011

Ministerial assurances

Future service levels

In a Westminster Hall debate on 31 March 2011, Theresa Villiers effectively promised that there would be no service cuts on the existing network once HS2 is built. In response to a speech by Dan Byles MP, in which he said Coventry would see its fast trains to London cut from three to one an hour, she responded:[10]

> *"This is simply not true. There are some indicative forecasts in the HS2 analysis about how services might be configured in the future. The reality is that Coventry is going to enjoy frequent fast services."*

But the documentation is clear, the HS2 business case is premised on an assumption that Coventry will only have one train an hour, which will be slower because of additional stops.[11] If all the Birmingham passengers travel on HS2, it would be extraordinary if the present 20 minute frequency continued just for Coventry passengers. The HS2 business case includes a total saving of £5.4 billion for reductions to existing services.[12] If those services are not reduced, the cost of the scheme to taxpayers will rise.

Competition

In an interview with the Daily Telegraph, Phillip Hammond stated that:[13]

> *"Our proposed new high speed rail network would free up a huge amount of space on the current railways for more trains to operate. Building a whole new line would create scope for people who live on the current lines to have more frequent services that are less crowded – I would also hope that this additional competition could mean cheaper fares as well."*

This is apparently very attractive. But the existing services are generally good, so faced with a choice of using HS2 to get to Birmingham in 49 minutes or paying half price to go on the existing trains in 82 minutes, many people will save money and take a bit longer, especially when they arrive at a station in the heart of the city, with good public transport connections. They already do this in Kent, where the "Javelin" high speed services to towns like Chatham are underused, and passengers continue to use the cheaper, slower alternatives. If revenue is lower than expected, the cost to taxpayers will be higher.

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[10] Hansard, HC Deb, 31 March 2011, c163WH
[11] HS2 Limited *HS2 Technical Appendix*, March 2010, Appendix 2, pg. 23 http://webarchive.nationalarchives.gov.uk/20110131042819/http://www.dft.gov.uk/pgr/rail/pi/highspeedrail/hs2ltd/technicalappendix/pdf/report.pdf
[12] That is made up of £2.3bn for Phase 1 and £3.1bn for Phase 2 (line 11 in the business case table) and was confirmed by email from HS2 Ltd to HS2 Action Alliance on 12 April 2011.
[13] Millward, D. Commuter services could benefit from high speed rail, *Daily Telegraph*, 1 April 2011

Impact on the financial case

Ministerial assurances

Those assurances would have a major impact on the already poor financial case for HS2. Extra capacity and competition would reduce fares if they are not regulated to pay for the new line. But the published financial details assume no competition on routes served by HS2, and fares going up at RPI+1 every year until 2033, a 27 per cent increase above inflation. The overall additional revenue included in the HS2 business case is £27.2 billion (Net Present Value over 60 years). Unfettered competition would at least halve this, probably more. But if we assume the increase in revenue is £10 billion less, and promises services will not be cut wipe out a further £5.4 billion cost saving, then that has substantially increased the cost to taxpayers.

If this happened, it might be good news for the minority of the population who use rail and travel on this route, as they would have over-capacity and cheap fares. But it would represent an appalling cost to taxpayers. The alternative outcome – more likely given the Government's published plans and financial constraints – is that existing services will be cut; fares on HS2 will be priced at a premium; and, as for Kent, fares across large parts of the network will be raised as well to plug the financial black hole created by HS2.

Other major add-ons

The Victoria Line and the Northern Line (Bank Branch) from Euston are already seriously overcrowded. The Government's forecasts for HS2 would make this position untenable. Not only would there be massive growth in passenger volumes but the majority of InterCity passengers who currently use Kings Cross and St. Pancras would also travel through Euston.

Quite reasonably, Boris Johnson has now said that construction of the Chelsea – Hackney Line ("Crossrail 2") is essential to make HS2 work. That would entail at least another £10 billion of capital expenditure (that estimate is conservative given Crossrail is costing £15.9 billion).

Politicians and business groups in Birmingham, Manchester and Leeds are also likely to demand additional projects to connect HS2 to existing transport infrastructure. It will be difficult for any government to resist if London gains a new Underground line on the back of HS2.

Burying the Route

There will be strong demands to mitigate the environmental impact of the route, which will inevitably increase capital costs. Boris Johnson is already saying that the route should be a tunnel throughout in London.

Even if the Government doesn't make changes in response to these pressures now, it's highly likely that the Parliamentary Committee considering the Hybrid Bill would recommend changes. For example, the tunnel into the airport for the Heathrow Express is much longer than originally planned, even though the line didn't go through any obviously sensitive areas.

This note will work on a conservative assumption that burying additional sections of the line will add £3 billion to the final cost.

Conclusions

The published financial case is already extremely poor, a £17.1 billion net cost to the taxpayer for a capital cost of £30.4 billion. But the additional hidden costs could turn this project into a disaster for the taxpayer. Here are the costs discussed in this note:

Item	Cost, £ billion
Avoiding service cuts	5.4
Competition with the existing network	10
Crossrail 2	10
Mitigating impact on the route	3.0

Factoring these costs in, the "real" business case becomes:

Item	Value	Change
Capital costs	£43.4 billion	+£13 billion
Net operating costs	£19.3 billion	+£5.4 billion
Total costs	£62.7 billion	+£18.4 billion
Revenues	£17.2 billion	-£10 billion
Cost to the taxpayer	£45.5 billion	+£28.4 billion
Revised Benefit Cost Ratio	**0.82**	

The Department for Transport urgently need to either produce a new business case, or honestly represent the current one and the sacrifices entailed for passengers who will get a worse service with the construction of HS2. HM Treasury need to examine the scale of the uncosted commitments being made by transport ministers, which may be difficult to resist if the main project goes ahead.