

Rebutting the six myths about HS2

'The great enemy of the truth is very often not the lie - deliberate, contrived and dishonest - but the myth - persistent, persuasive, and unrealistic' JFK 1962

1: HS2 is NOT 'green' – it doesn't fit as part of the low carbon economy

The Government say HS2 will be 'broadly neutral'¹ for carbon. But it is unlikely to even be that:

- Trains that travel at 360km/hr use three times the energy of 200kmph trains²
- 87% of journeys on HS2 indisputably create more emissions – all the brand new journeys (22%) and all those switching from existing rail services (65%)³
- DfT say just 6 in every 100 travellers⁴ on HS2 switch from flying. But this assumes the decline in relevant air routes reverses, and satisfying 'suppressed' not real air demand⁵
- The air emissions savings depend on the freed-up slots not being used for long haul, which BAA say they will⁶, and using out of date numbers on the modal switch from air⁷.

A showcase £30bn transport investment such as HS2 should contribute to UK's target of reducing emissions by 80% by 2050.

Environmental organisations agree HS2 is not green: Green Party, those signing the Right Lines Charter (CPRE, FoE, Greenpeace, Woodland Trust, RSPB, ELF, Civic Voice, Chiltern Society).

2: HS2 WON'T bridge the North/South divide, or deliver economic benefits

Government claims for transformational benefits are based on belief, not evidence⁸. The evidence on regeneration (where HS2 acts as a catalyst) points to London winning:

- DfT say more than 7 out of 10 of the 30,000 jobs created by HS2 around stations will be in London⁹ ie not the Midlands or the North. (Old Oak Common, with 20,000 jobs wins most)
- Most of the jobs claimed will not be genuinely new jobs but ones that have moved from other areas in the region. HS2 Ltd concluded this, after consulting respected academics¹⁰
- DfT say 59%¹¹ of extra HS2 trips are for leisure; given DfT assume¹² trips to London grow at twice the rate of those from London, so more people and more money will go to London
- HS2 impacts on the service sector, in which London is dominant. So work is more likely to move to London, not away from it – another reason it re-enforces the North/South divide.

The evidence for the wider economic impacts (of the HS2 investment itself) is also small:

- The productivity benefit from shorter journey times is the key benefit, but it's already in the business case (and is overstated now DfT admit that time-on-board is not wasted¹³)
- The Wider Economic Impacts of better connectivity are relatively small, £4-£6bn¹⁴, and are mainly driven by use of freed-up capacity, which will need a new further subsidy to realise
- HS2 Ltd asked Imperial College if faster connectivity had any further direct benefits – they said 'very little' (max £8m/a)¹⁵ – but their conclusion was left out of the White Paper and not even referred to in the consultation materials.

3: HS2 is NOT a sound investment – it's not value for money

There is no commercial case for spending over £30bn on HS2 or justification for its subsidy:

- The extra fares (£27bn) don't cover the capital (£30.4bn) and operating costs (£13.9bn), even for the full "Y" network¹⁶, so it needs a subsidy – £17bn.
- The subsidy actually encourages travel (10m/a new journeys¹⁷ for Phase 1 alone) despite DfT's other initiatives to reduce travel, and in particular business travel
- Existing rail services will worsen – this is proven in Government's own case for HS2¹⁸
- It benefits the affluent – 47% of long distance rail travel is by the top 20% earning families¹⁹

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The latest 2011 business case cuts the benefits by over a third. The Government's headline £44bn of benefits for the full "Y" network²⁰ was well over £70bn just last year, when an independent report by FTI Consulting²¹ confirmed the business case was flawed.

But key assumptions have not changed and are still invalid – if corrected, the case that benefits exceed costs collapses:

- *Benefits are overstated by about 60%* they total more like £19bn not £44bn for the full "Y"²². The largest benefit (time savings) is based on all time spent on trains being wasted, with DfT disregarding this fundamental error on spurious grounds²³
- *Demand forecasts are still excessive*, they misuse (through projecting growth for too long – 35years) an out of date forecasting model (with discredited forecasting factors). This gives a doubling in background demand to 2043 – 47%²⁴ higher than it should be
- *Appraisal uses an unrealistic 'do minimum' comparator* with virtually no improvements for 35 years and so inflating the benefits such as reduced crowding and shorter waiting times between trains. They disregard valid alternatives to improve the existing railway

The overall effect of this is to greatly worsen HS2's value for money. The Net Benefit Ratio falls²⁵ from 1.6/2.0 to just 0.3/0.5 for London - West Midlands, and from 2.2/2.6 to 0.4/0.6 for the "Y".

So HS2 in fact delivers just 30pence to 60pence benefit for every £1 of subsidy spent!

The economic case for HS2 also:

- Fails to learn the lessons of HS1 on demand forecasting and competition
- Takes no account of new technology or Government's own initiative to reduce travel
- Fails to develop the 'best' alternatives, and repeatedly misrepresents the alternatives it does develop (including in the March 2010 Command Paper), see Myth 4
- Fails to properly explore the uncertainties in the long term forecasts, despite HS2's sensitivity to the level of demand forecast

4: A new railway is NOT needed to solve the rail capacity problem

The Government say there is a major capacity issue that only HS2 can solve. This is not so:

- *The 'best' option:* DfT didn't require the 'best' option be developed: ie to make incremental changes against demand; do low cost rolling stock and capacity changes first; address pinch-points when demand is strong enough. Rail experts say the 'best' WCML²⁶ option is:
 - Rebalance first and standard class; add more carriages (ultimately to 12 car except for Liverpool). Just this delivers 67% more capacity (112% in standard class), need not wait to 2026 and may be possible without any subsidy
 - Eliminate the acute crowding problem on the Northampton/Milton Keynes to Euston commuting services by modifying Ledburn Jcn without delay
 - Do other low cost infrastructure changes as needed, with the potential for a total of 177% extra standard class capacity providing an increased train frequency from 9 to 11/hr. This is against DfT's forecast background demand increase to 2043 of 102%, and delivered at greatly less cost than HS2

Rail experts also say there are low cost 'best' solutions for ECML and Midland Main Line too.

- *DfT's own option:* even the rail options developed for DfT solve WCML's capacity issue:
 - Rail Package 2 (RP2) involves more rolling stock and removing seven pinch-points. This delivers 151% more capacity²⁷ against DfT's background demand growth of 102%, not the 54% Government misleadingly claim²⁸, and RP2 has less crowding²⁹

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- RP2 looks like being over twice the value for money of HS2 for just one sixth the net cost, and this is despite Government latest attempts³⁰ to distort and bury RP2
- RP2 won't be disruption-free but neither is it comparable with the wholesale replacement of WCML under the last upgrade, or the 8-year rebuild of Euston that HS2 requires – described as like 'open heart surgery on a conscious patient'

The other rail options developed for DfT for other parts of the Y network generally produce huge amounts of additional capacity, which unsurprisingly are not good value for money.

- *Other alternatives:* these are not properly considered eg Government's own initiative to reduce travel (by faster connectivity with broadband, videoconferencing); rail pricing options.

5: HS2 will NOT greatly reduce domestic air travel

HS2 can only replace domestic air journeys served by its route. No one flies between London and Birmingham, and rail already has 79% of the Manchester market³¹.

- For Phase 1 the relevant air market is the 3m/a³² who fly the NW/Scottish lowlands route using Heathrow (just 15% of all passengers), and 6m/a for all London airports (30% of total).
- The full "Y" adds Leeds and Newcastle, but scheduled flights to Leeds ended in March 2011, and HS2 in 2032 only matches the current fastest train from Newcastle to London³³.

The Feb 2011 business case has fewer people switching from air to HS2, but is still optimistic:

- DfT say 6% of HS2 trips (8,166/day or 2.9m/a) for Phase 1 switch from air – 25% less than before (11,000/day)³⁴ – and 6m/a for the full 'Y' ie twice the relevant Heathrow route traffic
- To generate even 6% modal shift DfT have to assume the domestic air market will grow – they say by 128% by 2043 (last year DfT said 178% by 2033) – and their forecast is no longer constrained by supply, meaning it's not even real air journeys that switch to HS2. That much real growth could not occur without extra runway capacity for London.
- The NW/Scottish lowlands air route has been shrinking (by 32% from its 2004 peak), not growing. Some domestic air routes have grown (where surface transport links are poor, eg Aberdeen to Exeter), but overall domestic passengers have fallen by 22% from 2005 peak.

Overseas experience shows air can be decimated if HSR delivers very big reductions in journey times³⁵ and rail gets below the 3hr journey threshold. Given the 2011 timetable already shows Edinburgh can be reached in 4hrs, albeit by just one train, the HS2 promise of about 3:30-40 mins 21 years later (in 2032), makes any impact on air look marginal, at best.

6: The UK does NOT need to catch up with Europe – it is still ahead

The UK – unlike Europe – has had a fast national railway system for a long time. As Sir Rod Eddington said in 2006³⁶: '...with [rail] journeys between London and other UK major cities performing particularly well relative to journeys from other European capitals.'

We also have routes capable of 200km/h (125mph) – and still have quicker rail journey times between the capital and the five largest cities than in other major West European countries³⁷:

- Averaging 145 minutes in UK (or 148 mins using the same 5 cities as Eddington)
 - 151 minutes in Spain
 - 184 minutes in Italy
 - 221minutes in France
 - 244 minutes in Germany

Even Frankfurt/Cologne, which is a comparable distance and often quoted as a high speed rail success story, is in reality more like an intercity railway: while it halved its journey time it brought it down to little less than the fastest train we already have from Birmingham to London³⁸.

'When the facts change I change my mind. What do you do sir?' John Maynard Keynes

References

- ¹ 'High Speed Rail: Investing in Britain's Future' DfT, February 2011, Section 2.5.5 page 53
- ² The Institute of Mechanical Engineers estimate that travelling at 360km/h instead of 200km/h increases energy consumption by over 200%, 'Transport Policy Statement 09/03, High Speed Rail', Table 1
- ³ Sources of HS2 passengers from 'Economic Case for HS2', Table 3, Feb 2011
- ⁴ Op cit. Also for the full "Y" section 2.2.3 page 10 gives 6m trips per annum but without specifying total trips.
- ⁵ See HS2AA 'Review of Feb 2011 Consultation Business Case', April 2011, Section 3.2 for evidence sources
- ⁶ According to ENDS ('HSR set to boost UK emissions from aviation', 18 March 2011) and statement by Nigel Milton
- ⁷ The max reduction (23.2mt CO2) is unchanged from the March 2010 business case despite 25% less air modal shift (8,200 passengers/day in Feb 2011 case compared with 11,000/day in March 2010 case)
- ⁸ Professor Overman (LSE) in his October 2010 evidence to Transport Select Committee said: "...*Claims about the "transformational" nature of transport investments for particularly areas should be generally discounted in assessing these benefits because they have no convincing evidence base to support them.*"
- ⁹ Clarified by e-mail of 2 March 2011, between Phil Graham, Deputy Director HSR, DfT, and Hilary Wharf, HS2AA
- ¹⁰ 'HS2 Demand Model Analysis' HS2 Ltd, February 2010, Appendix 3, S A3.1.1 says advised by Roger Vickerman & Reg Harman. S A3.1.6 concludes its not a 'win win situation', envisaging activity re-locating within a region & to London
- ¹¹ 'Demand for Long distance Travel' HS2 Ltd, April 2011, section 6.18, page 15, gives the split of extra passengers HS2 causes: leisure 59%, business 37%, and commuting 4%. All leisure/commuting, which includes the HS2 uplift, is 70%,
- ¹² This is a consequence of the values of the income elasticities on demand used in the demand forecasting
- ¹³ 'Economic Case for HS2: The Y Network and London – West Midlands', February 2011, section 7.3.2 page 51
- ¹⁴ The Phase 1 benefits (NPV) total £20.6bn. Out of this, £4bn are due to the Wider Economic Impacts (WEI) – £3bn from 'agglomeration' and £1bn from imperfect competition, the former being due to freed up WCML capacity. The WEI is therefore on top of the other transport user benefits. For the full 'Y' the WEI are £6.3bn out of total £43.7bn (ie 13.7%).
- ¹⁵ 'Advice on assessment of Wider Economic Impacts: report for HS2' Daniel Graham/Patricia Melo March 2010 page 37
- ¹⁶ London West Midlands (phase 1) figures: extra fares of £13.7bn that don't cover the £24bn of capital costs (£17.8bn) and incremental operating cost (£6.2bn), and so require a subsidy of £10.3bn. All figures NPV
- ¹⁷ Estimated from 'Economic Case for HS2: The Y Network and London – West Midlands', Feb 2011 Table 2, page 19
- ¹⁸ The case assumes £5.4bn savings on existing services ('Economic Case for HS2', February 2011, Table 9, Page 41 Table 2, and at Page 12, item 11. E-mail exchange with HS2 Ltd confirmed both figures apply. The list of cities losing is at HS2AA's 'Review of Feb 2011 Consultation Business Case' April 2011, Section 9
- ¹⁹ 'Modelling Long-Distance Travel in the UK', Charlene Rohr, James Fox, Andrew Daly, Bhanu Patruni, Sunil Patil, Flavia Tsang RAND Europe, 2010.
- ²⁰ The latest Feb 2011 business case cuts the benefits for the 'Y' by over 40% (from over £73bn (in March 2010 case) to £44bn), and by 36% for Phase 1 (from over £32bn in March 2010 to £20.6bn). All figures NPV
- ²¹ 'Review of the Business Case for HS2', 13 December 2010, FTI Consulting
- ²² See HS2AA's 'Review of Feb 2011 Consultation Business Case', April 2011, Section 5.7
- ²³ DfT argue the reduction in crowding and modal shift would fully off set taking time on board being productive into account ('Economic Case for HS2' page 51). But compared to a realistic alternative HS2 has greater crowding, and only the 7% of journeys transferring from cars have potential productivity gains. Business unit time is also over valued using 10-year old figures that now equate to £70k/a (see HS2AA's 'Review of Consultation Business Case', April 2011, S 5.2)
- ²⁴ Analysis given at 'Review of Feb 2011 Consultation Business Case', HS2 AA, April 2011, Section 3.1.5
- ²⁵ See HS2AA's 'Review of Feb 2011 Consultation Business Case', April 2011, Section 5.7
- ²⁶ See a summary on HS2AA website 'Options for increasing passenger capacity on WCML'
- ²⁷ See HS2AA's 'More capacity on WCML: an alternative to HS2', April 2011, where the 151% increase in seats in traffic over 2008 WCML base is calculated solely from published Rail Package 2 provided in DfT/Atkins reports
- ²⁸ The 54% is in Table 3.7 ('High Speed 2 Strategic Alternatives Study – Strategic Outline Business Case', March 2010), showing the increase in RP2 seats over the 'do minimum' of 54%. This is then stated in the White Paper (page 51, Table 2.4) as about 50%. But analysis shows the figure is based on the capacity over and above the 'do minimum' for WCML and Chiltern Line and not over the 2008 base for WCML (which is the basis of DfT's 102% forecast in background growth). This is discussed in HS2AA's 'More capacity on WCML: an alternative to HS2'
- ²⁹ RP2 has 51% loading ('HSR Strategic alternatives study: Strategic Alternatives to the proposed Y Network', Feb 2011, Atkins for DfT, Table 4.2, Scenario B). In 'High Speed 2 Strategic Alternatives Study, London to West Midlands rail alternatives: update of economic appraisal', Table 4.2, Feb 2011, it is shown as 55% loading (albeit with a higher 'do minimum' demand than HS2). HS2 loading is 58% ('Economic Case for HS2', Feb 2011 Page 19, Section 3.3.12)
- ³⁰ RP2 was re-assessed by Atkins for DfT in a Feb 2011 report, released late March 2011 ('High Speed 2 Strategic Alternatives Study, London to West Midlands rail alternatives: update of economic appraisal') to bring it in line with HS2. It fails to do this by using a different 'do minimum' comparator to HS2, and so deflating the benefits. It doubles rolling stock costs and increases operating costs by 70% (applying the same 41% optimism bias as HS2, despite obvious knowledge of RP2 operations). Even using all these changes except the 41% optimism bias, RP2's Value for Money criteria is over twice HS2 (3.4 NBR compared to 1.6 for HS2) and has one sixth the net cost (£1.7bn compared to £10.3bn for HS2). This is reviewed in the HS2AA report 'More capacity on WCML: an alternative to HS2' April 2011
- ³¹ ATOC press release 5 April 2011
- ³² All air passengers numbers are from CAA 'Table 12.2 Domestic Air Pax Route Analysis 2010' and earlier editions
- ³³ 'Economic Case for HS2' DT, February 2011, Table 1 gives London – Newcastle journey time of 2hr 37 mins (for 2032), which is exactly the time as the fastest Newcastle - London train in the summer 2011 timetable.
- ³⁴ Sources of HS2 passengers in Section 3.5 of HS2AA 'Review of Feb. 2011 Consultation Business Case', April 2011
- ³⁵ Osaka to Tokyo halved journey times with High speed Rail from 6hrs 30 mins to 3hrs 10 mins (then 2hrs 30 mins); Madrid to Seville (was 6hrs 30 mins and became 2hrs 45 mins, then 2hrs 30 mins)
- ³⁶ 'Eddington Transport Study: Main Report: Volume 2', section 2.18
- ³⁷ Detailed workings in 'Myth 6- The UK lacks a fast national railway network' HS2AA, January 2011
- ³⁸ Frankfurt Cologne is 180 kms and reduced its journey time with HSR from 2hrs 20 mins to 1hr 10 mins., compared to London Birmingham (182 kms), where fastest train from Birmingham is already 1hr 12 mins.