

There is we believe irrefutable evidence on capacity on WCML:

- There was an independent study done in Dec 2011 of existing peak demand, after FOI's were persistently refused. This concluded it was on average 56% full in the peak and this is BEFORE the new longer intercity trains arrive. WCML is also considerably less overcrowded than many other lines into London
- While both Network rail and DfT refer to WCML being full within a decade this not what either of their own forecasts actually say. These statements are based for example on saying the recent trends will just continue, but clearly even Network rail do not base their own work on such statements, nor would we expect them to
- DfT's own rail model (that doubles growth by 2037) has been found to be flawed by using out of date PDFH version that includes a 'distance term' that even DfT's research (by Oxera and Arup) now admits no longer applies. DfT's own latest analysis (published in Jan 2012) shows what a huge effect this has on their business case (taking Phase 1 down from a BCR of 1.4 to 1.0).
- In the modelling of WCML demand DfT excluded the effects of Evergreen 3, and we were told by Ms Munro that this did not matter because their modelling ignored the effect of price. No serious demand model can ignore price. Indeed as might be expected Chiltern Railways report that Evergreen 3 has already delivered an increase in business travel (taking demand from WCML).
- The 51m alternative to HS2 enables three times more capacity to be delivered (by longer trains, less first class and addressing 3 pinchpoints on WCML) compared to the 2007 base (which was what was used for the feb 2011 business case). This was confirmed by the Transport Select Committee in their Annex at pages 91/92. The TSC advisors crawled over the 51m figures and concluded 51m's alternative did deliver what they said. So the 51m alternative more than meets even DfT's demand forecast figures.
- Network Rail too in their report (of Nov 2011 for DfT) did not dispute that the 51m alternative could meet long distance capacity needs (they queried the suburban capacity needs that was not the purpose of HS2, and in any event was not the position, as I am sure 51m can explain)

Why HS2 is not in the national interest – January 2012 review

1. HS2 is a waste of money

HS2 is very poor value for money: the real figures reveal the benefits to be less than the cost of the subsidy, and there are much cheaper and better value for money alternatives that meet capacity needs.

There is **no commercial case** for HS2 on Government's own numbers:

- HS2 requires a subsidy of £13.5bn for London/West Midlands (phase 1) and some £25bn for the full Y (figures that are up to 35% greater than the case on which the Government consulted (Feb. 2011)¹)
- This subsidy is perverse as:
 - Rail travellers are relatively affluent, with the top 20% of households by income accounting for 47% of long distance rail travel²
 - HS2 encourages new travel, with 24% more long distance trips (32m/a for the Y)³ – which is over twice the number forecast to switch from air (3% of HS2 users) and road (8%) combined
 - It is contrary to other DfT initiatives eg reducing business travel by using new technologies.
- The net revenues now cover just 30% of capital costs, down from over 40% since Feb. 2011 case.

Existing rail services will also worsen: a £7.2bn saving is assumed in the HS2 business case from this. Any new services that use the freed up capacity on the West Coast Main Line (WCML) will require an extra subsidy (on top of the £25bn) – a fact that is omitted when Government promote this benefit.

In cost/benefit terms HS2 is **not value for money** (as the attached table demonstrates):

- The business case has been radically declining, to broadly half what it was when first published:
 - Phase 1 in the 2010 White Paper started at £2.4 of economic and welfare benefits (£2.7 with wider economic impacts (WEI)) for every £1 of subsidy – but is now just £1.4 (£1.7 with WEI)
 - Figures for the full Y are much worse, with benefits declining from £4.0 (about £4.3 with WEI) in 2010 to just £1.6/£1.8 (or £1.8/£2.5 with WEI) in their latest January 2012 case.
- Even Government categorise schemes below 1.5 (as Phase 1 now is) as 'low' value for money. Philip Hammond told the Transport Select Committee (TSC) that schemes 'much below 1.5 would certainly be put under some very close scrutiny'. This contrasts with road schemes commonly over 10.
- But the real position is far worse and hidden in the published detail. Simply using the more recent economic forecasts and the latest version of the rail forecast model reduces the value for money for Phase 1 to below £1 – so the subsidy exceeds the benefits. But even this still greatly overestimates the likely benefits, as discussed below. The true value for money is less than 50p back for every £1.

Government use a **distorted assessment basis** (to achieve even £1.4:1) to flatter the case for HS2:

- Half the HS2 benefits depend on the 'hotly contested issue'⁴ of journey time savings. It assumes that all time spent on board trains is wasted, so a minute off the journey time is a minute extra productive time. Despite widespread recognition (now even by DfT) that all time is not wasted, DfT declare their basis as 'fit for purpose'. But:
 - It ignores extensive research on how time is spent on trains, as Oxera and others told TSC
 - It uses 11-year old data (of £70k/a average businessmen's earnings) that cannot be robust to major (six-fold) increases in rail business travellers. DfT knew of this issue in June 2010⁵, and was re-affirmed by TSC's advisors, but persisted with an old figure – one third too high.

- DfT argue if they do alter their basis it has little effect on the benefits. But this is because they ascribe unrealistically high levels of crowding benefits to HS2. DfT also ignore the fact that including crowding benefits would make the rail alternatives even better value for money, and despite TSC's recommendation⁶ fail to re-evaluate them.
- Using an outdated rail forecast model that overestimates long distance rail growth on WCML, even though Government have compelling evidence that the basis is discredited⁷. They then increase the values in their latest draft guidance to match what they have used, without any evidence!
- Exaggerating the cost savings attributed to HS2 from the conventional rail network. They treat them the same way as new costs (and actually increase them for optimism bias!)⁸.
- Using a version of the rail demand model that ignores differences in cost between different ways of making the same rail journey⁹. Not only is HS2 assumed not to charge premium fares, but no account is taken of Chiltern Railway and London Midland providing cheaper alternative services on the London/Birmingham corridor, which attract custom from the Virgin express services. Contrary to DfT's modelling, the post-Evergreen 3 Chiltern Railways services have been a success, winning customers from WCML¹⁰. This overestimates demand on WCML without HS2, and demand for HS2.
- Projecting demand on the long distance fast services on WCML to increase until it has doubled, without any basis. The TSC advisors (Oxera) describe this as 'somewhat arbitrary'¹¹. Usual DfT guidance would be to cap rail growth after a specified number of years eg 18 years
- Deliberately costing the alternatives (of improving the existing railway) on a less favourable basis than HS2. They use a more expensive basis for costing the extra rolling stock¹², and give no credit for it being implemented incrementally in stages – only if and when demand requires it¹³.

Despite this, on the Government's own assessment there are **better value for money alternatives** than HS2 that do meet even their own estimates of a doubling in long distance rail demand:

- Atkins (for DfT) developed an alternative of improving the existing network (Rail Package 2) which they now assess at over twice the value for money of HS2 (over £4 benefit per £1 of subsidy)
- 51m developed an 'Optimised Alternative' (OA) that improves on DfT's best alternative, with very limited work on the infrastructure (at just four locations), but longer trains (12 and 11 car instead of the planned mix of 11 and 9 car) and one 1st class car reconfigured to be standard class. It provides all the capacity needed to serve all the flows that HS2 addresses, at 10% of HS2's build cost (£2.6bn compared to £32.8bn¹⁴) and is three times better value for money (even on the less favourable costing basis used) – giving £5.2 (or £6.1 with WEI) per £1 of subsidy¹⁵.
- The benefits of the alternatives are not dependent (as HS2 is) on the exaggerated value of journey time savings, as they are directed at achieving the needed capacity and not journey time reductions.

2. HS2 is not needed for capacity

Claims that WCML will soon be full are not robust and the demand forecasts are over optimistic. Even so the alternatives to HS2 indisputably meet forecast required capacity, and are a better, low risk option.

WCML will not be full within the next ten years, despite claims by Government and Network Rail (NR):

- NR use a misleading technical sense of 'full'¹⁶, and although both say it's full, their own forecasts of rail demand do not support it¹⁷.
- Currently WCML is far from full. A recent independent study shows Virgin Train peak services out of Euston in the evenings are on average only 56% full¹⁸ and Manchester trains 45% full. Tellingly this is before the extra carriages currently being delivered – providing 51% more standard class capacity.

- Government have re-based their demand forecasts (to 2011) to take account of the recent growth in rail traffic as a result of the massive service improvement that accompanied the completion of the £9bn WCML Route Modernisation and the December 2008 timetable – with faster more frequent services and the restoration of reliable weekend services. But this ignores the fact that the growth was concentrated in the off peak services – which requires no additional capacity to accommodate it.
- If it were true that WCML were full then the rail alternatives would be the only way of developing capacity sufficiently quickly to accommodate extra demand without excessive crowding developing.

HS2 does not provide more capacity for 15/20yrs – 2026 (for Birmingham) and 2033 (for Leeds and Manchester) ie well after WCML is claimed to be full.

Not only is forecast growth inflated (by using an outdated model), but the **doubling is also optimistic:**

- Population growth (19% to 2037) only accounts for less than one fifth of the doubling
- DfT admit total journeys by all transport modes are declining not increasing, with no increase per person in long distance domestic travel in the UK since 1995¹⁹. So growth in rail depends on a shift from other modes. But it is not credible that modal shift can just continue indefinitely.
- Rail may also grow by much less, as it relies on a relationship between economic growth and long distance domestic travel that for all travel modes collectively seems no longer to exist²⁰.

Nevertheless, **the alternatives deliver more than DfT's forecast** long distance capacity requirement:

- The OA enables a tripling in capacity from a 2008 base, comfortably accommodating the Government forecast of doubling in demand to 2037. The TSC, Atkins (for DfT) and NR all accept OA is able to deliver this capacity²¹ and NR confirm the illustrative timetable demonstrating its feasibility is sound
- The OA is entirely based on existing technology, unlike HS2. With the same technological developments as HS2, there is the prospect of even greater capacity.

Despite this, Government, TSC and NR all claim that the OA does not provide sufficient capacity:

- TSC questions if it can meet peak demand, referring to the 'recent dramatic growth' in WCML as evidence – but as noted above this growth was in fact achieved predominantly in the off peak
- NR says it does not deliver the capacity needed for forecast growth in suburban demand
- Government observe that OA makes no contribution to inner suburban capacity into Euston²².

But inner suburban demand was not the problem OA addressed, nor did Government's own alternatives consider it. It is a new issue raised because OA is overwhelmingly superior to HS2. 51m were not invited by NR to discuss their OA, and have since shown how it can meet commuter demand into Euston. No one would seriously suggest a new high speed railway just to relieve commuter overcrowding.

If rail demand doesn't grow as predicted, as HS1 found (running at just over a third of forecast), then:

- Because HS2 is an all or nothing project, we would have a new railway running at a large loss, requiring an even larger subsidy for generations to come.
- In contrast, the alternatives can be implemented quickly and in stages, with more capacity only created – and paid for – if it is needed. It also addresses commuter overcrowding long before 2026

It is HS2, rather than the existing rail system alternatives, that has capacity problems:

- The HS2 trains serving places beyond the high speed network (on the existing network) have less capacity than those trains they replace²³. This means that HS2 trains would be impossibly crowded with the additional demand induced by HS2.

- The Feb. 2011 consultation business case of 18 trains/hr was groundless. An FOI investigation confirmed that the only documented assessment that HS2 Ltd had prior to consultation showed that 18 trains/hr was not possible²⁴. HS2 Ltd commissioned their studies after the consultation began.
- The service pattern for the Y now assumes a maximum of 17 (not 18) trains/hr, and does not reduce off-peak (as previously). This is because 2 trains/hr (each way) are planned for Heathrow, which carry few people, leaving an increased demand to be carried by fewer trains. It is doubtful that such an intensive service could operate, or be reliable (due to an inability to recover from perturbations).

3. HS2 will create few jobs and rebalance the economy in favour of London

Experts agree there is no valid evidence for the claimed transformational benefits. London will gain most.

Government contend that HS2 will rebalance the economy (the North/South divide) but this is groundless:

- The academic studies of Europe's experience²⁵ of the impact of high speed rail (HSR) find 'compelling reasons to doubt whether HSR will contribute to rebalancing the economy'²⁶ eg:
 - Despite business creation there is no evidence the TGV led to decentralisation from Paris
 - The TGV to Lyon caused some business headquarters to relocate to Paris and the net impacts were negative for Lyon
 - On the Paris Rhone Alps route passenger growth in trips to Paris was three times greater than from Paris and for intra-organisational trips it was eight times greater
 - Unemployment in Lille rose against the French national average, with the arrival of the TGV
 - HSR in Spain is associated with a strengthening of Madrid at the cost of regional centres.
- Supporters of HS2 rely on studies on the potential effects of HSR done using an unsound and discredited methodology²⁷ that is insufficiently robust to provide valid results
- Experts say where HSR connects to a dominant capital city, it benefits most. Leading academics acknowledge this point in TSC evidence and expect HSR to re-enforce London's dominance.

Government claims that HS2 will create many jobs outside London are also groundless:

- The much publicised 1 million extra jobs from HS2 is incorrect²⁸, deriving from a study of possible economic developments that would have resulted in 1 million extra jobs for 2020 – six years before even the first phase of HS2 could be running.
- The reality is HS2 Ltd predict just 9,000 temporary jobs to construct HS2 (Phase 1) and 1,500 new jobs to operate it (before taking into account the job losses from reductions to conventional services).
- 30,000 new jobs are expected in the vicinity of new stations, but these are not new jobs but likely to be at the cost of other locations in the area, and in any event are predominantly (73%) in London.
- DfT assume leisure travellers outnumber others and that trips *to* London will grow at twice the rate as those *from* London: this will bring more people and more money to London

In terms of connectivity most places will be made worse off by HS2, as they will lose some of the benefits of the existing network, with services are withdrawn or changed to accommodate HS2. Others lose out as inevitably there will be less money to go round. The attached map shows likely 'winners and losers'.

4. HSR is not needed to catch-up with Europe

Compared to Europe, our geography, passenger priorities and existing intercity network suggest there is no case for HSR on the same basis as other countries, as we are already ahead in connectivity.

High speed it is not a priority for rail travellers. Passenger Focus studies and a survey of European Countries²⁹ show the UK has a higher satisfaction (92%) with journey time– 2nd highest in Europe – and it is the highest scoring factor for satisfaction with rail travel in the UK.

The UK – unlike Europe – has had a fast national railway system for a long time. As Sir Rod Eddington said in 2006³⁰: ‘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 countries³¹:

- Averaging 145 minutes in UK (or 148 mins using the same five 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 is more like our intercity: it halved its journey time but to only a little less than the fastest train we have from Birmingham to London³².

5. HS2 is not green

Speed is not green. HS2 is environmentally destructive and disruptive, far more so than the alternatives.

HS2 will not reduce CO2 emissions – even Government still claim it’s only ‘broadly neutral’ for carbon

- HS2 induces twice as many brand new trips (24% of HS2 users) as it saves in modal shift from air and road trips (3% and 8% of HS2 users respectively)³³. Their emissions figures exclude the new journeys that will be made to connect to HS2.
- Almost 90% of HS2 users will create more emissions –the brand new journeys (24%) and those switching from existing services (65%).
- Any freed-up runway capacity will be re-used for more polluting longer haul flights – say BAA
- Conventional speeds require much less energy consumption (the physics is undeniable). Trains travelling at 200 km/hr use three times less energy than those at 360 km/hr³⁴.

HS2 will be massively destructive to the natural environment, as it takes an entirely new route through tranquil countryside, ancient woodlands, and the Chilterns Area of Outstanding Natural Beauty (AONB), all that are irreplaceable. The Government failed to conduct a Strategic Environmental Assessment that examined the alternatives and their environmental impact.

Government claims that it has greatly reduced the environmental impact of the route in its latest plans. The reality for many is different. Far from spending more on mitigation in some areas they saved money through shallower cuttings eg even in the AONB they spent less (reducing cuttings by nearly 8 metres to as little as 2 in places). The additional tunnel was actually to overcome a previously unappreciated technical problem (damaging aquifers), and saved money.

Both NR and Government claim the alternatives would be too disruptive on the WCML – but the opposite is true as it is HS2, not the OA, that will be massively disruptive:

- HS2 requires the complete rebuilding of Euston over 7-8 years – while train operators struggle to provide services. In an unguarded statement HS2 Ltd admitted to the TSC that they might only be able to provide the current off-peak levels of service³⁵. The OA requires no work at Euston.
- The OA is not a rerun of the last WCML upgrade, as it involves addressing just four pinch points, and is similar to works currently being done on this route. It does not involve the wholesale renewal of track, signalling and electrification as the previous route modernisation did.

The January 2012 business case figures

1. Summary of DfT central case (all adjusted to 2011 money)

£bn NPV 2011 prices	PHASE 1			FULL 'Y'			* range
	Mar-10	Feb-11	Jan-12	Mar-10	Feb-11	Jan-12	
Benefits	£32.70	£18.9	£19.0	c £76	£42.7	£44.15*	(£41.4 - 46.9)
(with WEI)	£36.8	£23.6	£23.1	c £83	£50.1	£53.25*	(£47.2 - 59.3)
Costs							
capital	£20.2	£20.2	£18.8	c £33	£34.6	£36.4	
operating	£8.6	£7.0	£8.6		£15.8	£21.7	
Revenues	£17.0	£15.5	£13.9		£31.0	32.9*	(£31.8 - 34.0)
Subsidy	£13.5	£11.7	£13.5	c £19.2	£19.4	£25.2*	(£26.3 - 24.1)

VfM: benefits per £1 of subsidy

BCR (with WEI)	£2.4 £2.7	£1.6 £2.0	£1.4 £1.7	£4.0 c 4.3	£2.2 £2.6	£1.7* £2.1*	(£1.6 - 1.9) (£1.8 - 2.5)
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WEI = Wider Economic Impacts

* range midpoint (low end if stations are out of town, high end if in city centre)

BCR = Benefit Cost Ratio shown as benefits per £1 taxpayer cost ie subsidy

2. Summary of best alternatives for improving WCML

VfM: benefits per £1 of subsidy

BCR with:	DfT's Rail Package 2 (RP2)			51m opt. alternative (OA)*		
	Mar-10	Feb-11	Jan-12	Mar-10	Feb-11	Jan-12
Purchased trains (with WEI)	£3.63	£1.90				
Leased trains (with WEI)	£2.85	£1.30	£4.01			£5.17
			£4.66			£6.06

WEI = Wider Economic Impacts

OA = 12 car trains (ex Liverpool), 3 first class, addressing 4 pinchpoints

RP2 = 11 car trains, addressing 7 pinchpoints

3. The real Business Case for HS2

BCR January 2012 (excl WEI)	Phase 1	Full Y	Notes
	1.4	1.6	
<i>Adjusted by DfT for:</i>			
1. Nov. 2011 GDP forecasts	-0.1	-0.1	Will reduce again in March 2012
2. Latest demand (PDFH 5.0) model	-0.4	-0.4	Endorsed by research, but not adopted
adjusted BCR	0.9	1.1	
<i>Other adjustments</i>			
3. Incorrect use of 41% optimism bias	-0.07	-0.1	DfT say no relevant guidance (to savings)
4. Underestimate in PM/prelim costs	-0.05	-0.05	Identified by Network Rail
5. Updated businessmen's earnings	-0.3	-0.3	DfT do not mention or adjust 11yr old fig
adjusted BCR	0.48	0.65	
6. Assuming time not wasted on trains	*	*	DfT say -0.1, but a gross undervaluation
Real Benefit Cost Ratio (BCR)	well below 0.50		

* most of residual benefit

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- ¹¹ 'The economic case for HS2: Value for money assessment'. January 2012, Table 2, page 19
- ² From data taken from 'Modelling Long-Distance Travel in the UK', Charlene Rohr, James Fox, Andrew Daly, Bhanu Patrui, Sunil Patil, Flavia Tsang RAND Europe, 2010.
- ³ Based on 24% of HS2 trips being entirely new, and HS2 carrying 380,000 journeys/day. 'Economic Case for HS2: Updated appraisal of transport user benefits and wider economic benefits', Jan. 2012, table 2 page 23 and s. 3.2.1.
- ⁴ HofC Transport Committee High Speed Rail, 10th Report of Session 2010-12, para 65, page 31
- ⁵ HS2 AA and Bluespace Thinking raised these problems with HS2 Ltd and DfT in a meeting in June 2010. DfT recognised that there were issues with using such old data.
- ⁶ Paragraph 69 of HofC Transport Committee Report, High Speed Rail, 10th Report of Session 2010-12, Volume 1
- ⁷ Research showed that the 'distance term' that makes the rail demand elasticity on income increase with length of journey is wrong. The Passenger Demand Forecasting Handbook (PDFH) V4 was corrected to remove this term in August 2009 (PDFHv5). Since then DfT have had the results of a major review (by Oxera and Arup) that confirm the distance term does not exist. Meanwhile DfT did not ratify draft guidance that reduced the maximum elasticity to below the level used for HS2, which was issued in January 2010, and replaced it with draft guidance containing the higher values used in the HS2 assessment. No evidence has been offered to support doing this.
- ⁸ DfT claim there is no guidance on using optimism bias as justification for increasing cost savings. This is nonsensical, as the purpose of applying optimism bias is to correct the tendency to underestimate cost subject to uncertainty – not to increase estimates of savings in well know current cost.
- ⁹ Alison Munro (Chief Executive, HS2 Ltd), admitted that the version of the demand model (PLANET) HS2 Ltd were using does not take the price of alternative rail routes into consideration (letter to Bruce Weston, 29 June 2011)
- ¹⁰ Modern Railways, January 2012
- ¹¹ 'Review of the Government's case for a High Speed Rail programme', Oxera, 20 June 2011, section 3.16
- ¹² Rolling stock is costed in Jan. 2012 case as leased for the rail alternatives, but purchased for HS2. Leasing is more expensive. Until the Jan. 2012 case, DfT gave the rail alternatives' assessment on both bases. The additions to costs for optimism bias are the same or higher for the rail alternatives than HS2. This is despite operating costs on WCML being thoroughly known and understood.
- ¹³ The additional capacity of the OA is assumed in DfT's assessment to be created for first use in 2026 ('High Speed Rail Strategic Alternatives Study – Update Following Consultation', Atkins, January 2012, section 5.3.2, page 26), this is despite acquisition of rolling stock for HS2 being assumed to be staggered to reflect the build-up of demand ('A Summary of Changes to the HS2 Economic Case' April 2011 section 2.1.1, page 6).
- ¹⁴ 'Economic Case for HS2: Updated appraisal of transport user benefits and wider economic benefits', January 2012, Table 6, page 34
- ¹⁵ 'High Speed Rail Strategic Alternatives Study – Update', Atkins, January 2012, table 5.8, page 28
- ¹⁶ HofC Transport Committee, High Speed Rail, 10th Report of Session 2010-2012, Para 32, Page 19. 'Full' is when, at certain times of day, it would not be possible to provide train paths for extra services which train operators wanted.
- ¹⁷ Network Rail forecast in WCML RUS; DfT's forecast of doubling by 2037
- ¹⁸ Research conducted by Customer Research Technology Ltd, 30/11/2011. This was commissioned by HS2 AA following DfT's refusal to provide the information on peak loadings. The findings have not been disputed.
- ¹⁹ From the National Travel Survey, table NTS0307
- ²⁰ This is a development found in other developed economies. Crozet in an OECD discussion paper observed: '.....In Germany, the UK, Italy and France, domestic passenger traffic has been more or less

flat since the early 2000s.' '(The Prospects for Inter-Urban Travel Demand', Y. Crozet — Discussion Paper 2009-14 — OECD/ITF, 2009, section 2.2)

21 HofC Transport Committee Report, High Speed Rail, 10th Report of session 2010-12 pages 92/3; Network Rail's Review of the Strategic Alternatives to HS2, November 2011, Section 2.3.3, page 17 and section 2.3.2 page 13; High Speed Rail Strategic Alternatives Study Update by Atkins, January 2012

22 'The economic case for HS: Value for money assessment'. January 2012, section 10.11, page 24

23 HS2 'classic compatible' trains have 550 seats, compared to 600 on an 11-car Pendolino, 664 with 11 car, and about 649 for 10-car IEP trains.

24 Work by Systra for Greengauge 2 (reported in October 2009), and a series of workshops documented by Greengauge 21 ('High Speed 2 Interfaces' July 2010) that DfT and HS2 Ltd attended, both of which show that a maximum of 15-16 trains per hour might be achievable, instead of the 18 trains per hour that was accepted without evidence by HS2 Ltd and their Technical Challenge Group in September 2009.

25 See Professor John Tomaney's (Director, CURDs) written and oral evidence to Transport Select Committee (2011) that summarises and cites the academic research in this area. He finds it difficult to find robust evidence that supports the Government's position

26 Para 6.3 of Prof Tomaney's report on Local and Regional Impacts of HSR in the UK, A Review of the Evidence

27 Dr Lairs and Prof Mackie reviewed the approach used by KPMG for The Northern Way, finding it deficient. This conclusion was echoed in Prof Tomaney's evidence to the Transport Select Committee (cited above)

28 See note by HS2AA 'Will HS2 benefit the North? – A resume of the evidence' September 2011

29 At HS2AA's Consultation Submission (July 2011) Appendix 1.1- details of 2011 Euro survey & UK's NPS survey.

30 'Eddington Transport Study: Main Report: Volume 2', section 2.18

31 Details of HS2AA's study are in HS2AA's Consultation Submission (July 2011), App. 1.2 'Journey Times in Europe'

32 Frankfurt Cologne is 180 km and reduced its journey time with HSR from 2hrs 20 mins to 1hr 10 mins., compared to London Birmingham (182 km), where fastest train from Birmingham is already 1hr 12 mins.

33 'Economic Case for HS2: Updated appraisal of transport user benefits and wider economic benefits', January 2012, Table 2, page 23

34 Transport Policy Statement 09/03, High Speed Rail, Table 1. Institute of Mechanical Engineers

35 HS2 Ltd's written evidence to the Transport Select Committee