



51m
Response to
HS2 Consultation

51m RESPONSE TO DFT CONSULTATION ON HS2

Introduction

1. 51m is a consortium of Local Authorities opposed to the HS2 route. The Group is called 51m because £51m is the cost to each Parliamentary constituency in the UK of the HS2 project.
2. This response is without prejudice to 51m's view that the consultation and the process of which it is a part are deeply flawed.
3. The starting point for a lawful and useful consultation exercise is that the principle of the decision has not already been decided upon. 51m is responding to this consultation on the basis that the Government will approach the decision whether to proceed with HS2 with an open mind, and will consider all the arguments for and against fully and fairly. The work that 51m has carried out is directed at central issues as to whether HS2 should proceed, including economic benefits; the business case; the impact on CO2 emissions and environmental sustainability. It hopes that, notwithstanding various statements to the contrary, the Government will approach these issues with an open mind.
4. 51m are concerned that very strong statements from Government ministers in favour of HS2 may already have had the effect of discouraging people from engaging in the consultation process because they do not believe that it is being conducted fairly.
5. The vital importance of the Government approaching HS2 with an open mind is made all the more fundamental by the proposal to proceed with the project by way of a Hybrid Bill. The nature of the Hybrid Bill process is that there is no detailed scrutiny of the merits or demerits of the project, and opponents are deprived of any opportunity to put forward their arguments against the scheme. In these circumstances the consultation and the Secretary of State's decision whether or not to proceed are the critical stages, and must be undertaken with the utmost fairness.
6. It is 51m's view that the Hybrid Bill process is inappropriate, particularly given the need for all the interested parties to make representations as to whether HS2 should be given approval. The Hybrid Bill process, with the principle of the Bill being decided on the floor of the House of Commons, should not be used for approving such a highly controversial scheme. Comparisons with the Crossrail Bill are completely misconceived because that

was a project where there was a very high degree of unanimity about the need for the scheme. Not a single local authority objected to the principle of the Crossrail scheme, in notable contrast to the position on HS2.

7. Therefore it is 51m's view that if the Government decides to proceed with HS2 at all, then it should do so through the procedure expressly (and so recently) set up under the Planning Act 2008 for nationally significant infrastructure projects. This will ensure independent scrutiny of the project, through a procedure that allows full representations to be made.
8. Quite apart from 51m's concerns as to whether the Secretary of State has already made up his mind, the consultation which has been undertaken is fundamentally flawed in a number of key respects.
9. Firstly, the consultation purports to be on the principle of HSR from London to Birmingham, Manchester and Leeds, i.e. to cover the Y route. However, information about the actual line of the route is only given for phase 1 to Birmingham. This approach is hopelessly flawed and cannot form the basis of a lawful decision to proceed. The DfT ask consultees to consider the benefits of the proposal for the full Y, taking into account the business case for the full Y, but have provided no information on the route of phase 2 (the Y north of Lichfield). In these circumstances it is impossible to weigh up, properly or even at all, the disbenefits of phase 2 against the alleged benefits. Consultees cannot consider the impacts and whether they are justified without even an outline of the route.
10. Secondly, even in respect of phase 1 the level of detail provided is inadequate for consultees to give a properly considered response. This is true in a number of areas, including;
 - a) Affected householders have not been told the extent of "buffer zones" and therefore whether or not they are within them;
 - b) The lack of information about the equalities impacts, which results from the failure to undertake a proper Equalities Impact Assessment;
 - c) information which underpins the business case such as peak loadings on existing services on the WCML, evidence to support 18 trains per hour;
 - d) any level of detail on the proposed policies on mitigation;
 - e) accurate assessment of the compensation implications of the project.
11. Thirdly, the form of the consultation questions are strongly biased towards getting a favourable answer, and do not cover critical issues, such as the

climate change impact of the proposal. It is 51m's clear view that the consultation document, and the supporting documents do not set out a fair and objective assessment of the pros and cons of HS2, but are systematically slanted towards getting the answer that the Government seeks. This is both unlawful and profoundly unfair. It also forms the basis for very poor decision making. Therefore before we deal with the answers to the questions posed, we will set out a short overview of the reasons why HS2 should not be proceeded with. Further in the answer to each question we will provide a short introduction where we make clear what issues we are covering.

12. Fourthly there are a number of important areas where the DfT have refused to provide further information which would allow a fully informed consultation response. One principal example is that of the assumed 18trains per hour (tph), and on what evidential basis the DfT can base its entire business case on the assumption that this level of service can be provided.
13. This response to the HS2 consultation is supported and should be read in conjunction with the attached technical appendices which are referenced throughout this document.

Overview

14. HS2 is an enormously expensive (£30bn Net Present Value) and environmentally damaging piece of infrastructure, which conservatively requires £17bn (NPV) of public subsidy. Even on the DfT's own case, the Y has a benefit cost ratio ("BCR") of only 2.2 (excluding Wider Economic Impacts – WEI) and 2.6 (including WEI) and this reduces to 1.6 and 2.0 respectively for Phase 1 .
15. As is set out below these ratios are themselves based on over optimistic assumptions. HS2 should only be given the go ahead if there is a clear case in the national interest, which has been robustly and independently scrutinised. The DfT case is fundamentally flawed in a large number of respects and has not been adequately scrutinised and tested. It is notable that the rail industry and major transport consultancies have a strong vested interest in supporting this project and are possibly less than objective in their consideration of alternatives – simply for the enormous value of the contracts that will be let. This is an even greater concern because of the long history of over optimistic forecasting by the rail industry, both in terms of passenger forecasts and costs.

16. It is therefore of vital importance, and strongly in the national interest, that the case for HS2 be properly and independently scrutinised before such very large amounts of public money are spent.
17. 51m accepts that there may be benefits to high speed rail as demonstrated in some of the international examples given, but it must be the right project and properly justified. 51m is concerned that the Government is committing £billions to HS2 simply because HSR is a modern and glamorous form of infrastructure. This is particularly concerning where smaller and less expensive transport schemes would give far greater benefits in environmental, social and transport terms. The Government has recently commissioned a report on the rail industry by Sir Roy McNulty, where a principal message was that the UK should use its existing assets better. This is precisely the case that 51m is advancing.
18. Equally, the Government appears to be proceeding on the misapprehension that HS2 is a “green” solution, see the Queen’s Speech 2010. As is set out below this is simply not true, and undermines a central part of the justification for the project.
19. Further, it must be doubted whether HS2 is a sensible Government priority, particularly in times of austerity. The evidence shows that HS2 would largely be used by those in the highest income brackets (and many of those for leisure trips). In essence HS2 is a massive public subsidy to the well off, with at best some doubtful economic benefits.
20. In terms of carbon emissions the DfT’s own case is that HS2 will only be carbon neutral overall and significantly carbon negative for Phase 1 and 51m demonstrate in this response that it can be nothing but carbon negative. Given the massive public investment in the scheme, the importance given by the Government to addressing climate change and the need to reduce carbon emissions and the overall contribution of transport to carbon emissions, it seems bizarre that the Government should support a scheme with no carbon benefit. HS2 also generates a very large number of new trips, i.e. people who are not currently choosing to travel, and only achieves 7% of HS2 passenger shifting from car use and 6% from air. Emerging Government policy is to encourage people to travel less, and to prioritise schemes which achieve a reduction in carbon emissions. HS2 does neither.
21. The DfT has placed great reliance on international examples to support its case. The evidence suggests that the support is not well founded particularly because:

- International examples exist in critically different contexts, and therefore are very poor analogies;
- Other countries who have introduced high speed rail have more than halved journey times with HSR because their existing rail services were very much slower and usually less reliable; The WCML is a modern 125mph railway.
- The evidence of performance of international HSR has not been properly and independently examined: for example, the Dutch HSR has well recorded financial problems; the President of SNCF has stated that the conventional network is decaying as investment is focused on TGV (High speed) lines, and in Germany the classic network is slow and not comparable with the UK mainlines;
- In virtually all cases the distances involved in comparator countries are much longer than the journeys to be served by HS2.

Government Transport and Environmental Policy

22. In the most fundamental aspects this proposal appears to be contrary to key parts of Government policy;
- a) It involves a major subsidy into rail transport at a point in time when the Government is seeking to reduce subsidy to the rail industry.
 - b) It encourages people to travel more, indeed relies upon them doing so, when Government policy is moving towards encouraging less trips and more use of alternative technology, see White Paper January 2011 on Local Transport and DfT Consultation
 - c) It involves a relatively small modal shift, when Government transport policy is supposed to be focused on sustainable development, Coalition Agreement, Spending Review and DfT Business Plan amongst others.
 - d) It has neutral or negative carbon impact. This has serious implications for the Government's commitment to reduce carbon emissions under the Climate Change Act 2008, and the Government recent statements on the importance of creating a sustainable economy.
 - e) The claimed regeneration benefits are highly speculative and will be far less effective in achieving the policy objective of rebalancing the economy, than would far less expensive regional investments. This is contrary to the policy priorities of the Northern Regions Development Agencies.

- f) The DfT produced the Transport Business Case in April 2011 which sets out the basis on which projects will be appraised by the DfT. This Guidance has not been followed for HS2 in a series of critical respects. Each of the core criteria set out in the Business Case are not met by HS2.
 - g) Although the capital costs of HS2 will fall outside this spending review, £750m is to be spent in this parliament simply on achieving the Hybrid Bill.
23. The Government very recently commissioned Sir Roy McNulty to undertake a study into the potential of the rail system. His report, produced in May 2011 said;

“There should be a move away from “predict and provide” to “predict, manage and provide” with much greater focus on making better use of existing system capacity.”

HS2 is totally contrary to this approach.

Q1: Do you agree that there is a strong case for enhancing the capacity and performance of Britain’s inter-city rail network to support economic growth over the coming decades?– refer to appendices 5, 7, 8, 9, 14?, 17 & 18?

Introduction

24. 51m accepts that there is likely to be a need for some increased capacity on the inter-city rail in the next few years. However, we do not accept (a) the level of that need is anywhere near that set out in the business case, or provided by HS2; (b) that capacity enhancements should be provided in one massively expensive project which oversupplies capacity on one part of the network: (c) that HS2 will support economic growth effectively and that there are not much better ways to support growth.

National transport strategy and national priorities

25. In 51m’s view the starting point should be a properly arrived at national transport strategy. Such a document should strategically consider the national priorities for transport improvements, and where public investment should best be spent to meet those priorities. This should then be fully consulted on, and considered by all those with an interest in the national transport infrastructure. The danger of the DfT’s present approach is that one massively expensive project will take up the bulk of new public transport investment over the next 10 years, without any proper assessment of

whether this is the best way to meet the national interest. This approach distorts funding decisions in the sector, and will inevitably deflect investment away from projects with much better business cases, and which could provide far more in terms of regional regeneration. This is all the more the case at times when Government finances are severely stretched and money for new projects very limited.

26. Judgements as to the level of capacity required and the best way to meet it should be based on sound forecasts of future requirements and the solutions delivered in a cost effective, incremental basis, maximising the use of existing assets. This view is supported by the Eddington Study of 2006 and most recently by the McNulty Report of 2011.

“...because the UK is already well connected, the key economic challenge is therefore to improve the performance of the existing network... There are very high returns from making best use of existing networks [with...] large projects with speculative benefits and relying on untested technology, are unlikely to generate attractive returns” (Eddington 2007).

*“...there should be a move away from ‘predict and provide’ to ‘predict, manage and provide’, with much better use of existing system capacity”
McNulty 2011.*

27. It is quite clear therefore that the starting point in dealing with any capacity issues on the WCML, or elsewhere on the inter-urban rail system, should be making the existing capacity work more efficiently, not investing in huge new rail infrastructure projects.

Performance

28. InterCity services on most routes to and from London already provide competitive journey times and high frequencies. Birmingham and Manchester, for example, each now have a twenty minute frequency to London with journey times of 84 and 128 minutes respectively. These are lower than the great majority of journey times between the capital and principal cities in other major European countries, including such countries as France, Spain and Germany which have invested in high speed rail infrastructure; this reflects both the high quality of existing InterCity rail services to London and the lower distances between major population centres in Britain.
29. In relation to London-Edinburgh services, DfT rely on existing journey times of 4hrs 30 minutes (see Consultation Document fig 2), but ECML now run a

daily 4hr service, which is targeted at business travellers. So the journey time saving of the Y, even to Edinburgh is actually only 30 minutes. A fact not apparently reflected in the business case.

30. Indeed in the Spring 2011 National Passenger Survey (NPS) undertaken by Passenger Focus, Virgin Trains was classified in the top 4 for each of the categories of overall performance, length of journey time, reliability / punctuality and sufficient room for seating and standing. It performed significantly better than all other mainline routes out of London and this demonstrates that from the users perspective speed, reliability and capacity on WCML are not seen as key issues whereas commuter routes and inter-regional routes like Trans Pennine have significant capacity problems today.
31. We do not therefore believe that there is a critical need to improve journey times to and from London, although we would certainly support delivering further incremental journey time reductions. This can be achieved by for example electrifying and raising speed restrictions on the Midland Main Line, and raising maximum speeds to 140 mph (the design speed of the rolling stock) on the West Coast and East Coast Main Lines as signalling systems are upgraded to the European Train Control System (ETCS).
32. As can be seen from the NPS, the performance on the WCML in terms of journey time, reliability, punctuality and capacity is the best of any mainline in the UK and thus there is no justification for HS2 to be part of any solution for performance enhancements.

Regional distribution

33. It is also the case that journey times on existing routes reflect the excellent regional distribution provided by current services. For example, London – West Midlands trains call at Coventry, Birmingham International, Birmingham New Street, Sandwell and Dudley, and Wolverhampton, directly serving the key centres of population in the region.
34. In addition to the WCML route, the Chiltern Line, which from later this year will provide comparable journey times to WCML from London Marylebone, also serves Birmingham city centre, with stations at both Moor Street and Snow Hill and also directly serves Solihull, Warwick Parkway, a highly successful parkway station serving Warwick, Kenilworth and Stratford on Avon, and Leamington Spa. All of which are important population centres generating significant travel to London.

35. In contrast, HS2 would have fewer stops, contributing to its lower journey times, but only serves Birmingham Interchange and Birmingham Curzon Street, effectively downgrading the service to other centres, as “classic” route frequencies will inevitably be reduced. Birmingham Curzon Street is reasonably well located for the city centre, although less central than Birmingham New Street. However, links with the suburban rail network and city bus services will be much less convenient than New Street, with a c10 minute transfer to the key “hub” at New Street. As an example, passengers from the prosperous northern suburb of Sutton Coldfield can access New Street by suburban rail services, and it is difficult to imagine them then choosing to walk for 10 minutes to Curzon St, rather than simply taking the WCML from New Street to London.
36. The inconvenience of this transfer, and the time taken to make it, will substantially reduce or even reverse the journey time benefits for many passengers across the West Midlands. This additional time penalty does not appear to have been assessed within the DfT business case for HS2.
37. Additionally those passengers who currently have a direct service to London (e.g. Wolverhampton) will get little or no journey time benefit from having to travel into Curzon Street to catch HS2 together with the inconvenience of interchanging.
38. Rail also already has the great majority of the central London market from cities such as Birmingham, Manchester and Leeds. Future growth in these markets is therefore only likely to reflect overall growth in travel between the cities rather than further modal shift from air or road to rail, with only limited generation as a result of journey time reductions. This is already evident with Eurostar where although rail has c80% of the London – Paris/Brussels market, reflecting the high quality and fast journey times offered, passenger volumes are only about 40% of the levels originally forecast. The market is effectively saturated and the anticipated growth of overall journeys has not materialised.

Improvements to capacity

39. Before determining the solution to limited capacity, it is essential to carefully analyse the nature of the capacity shortfall, in order to decide how it can best and most efficiently be met. The DfT has notably failed to do this. The Consultation document has a number of generalised statements about overcrowding on the WCML, but no analysis of precisely where and when it arises – the only specific example quoted is passengers having to stand on

Birmingham – Scotland services, which simply reflects the fact that 5 car, low capacity trains are used on this route. This could obviously be overcome by lengthening the trains. Any capacity constraint on the WCML is entirely in standard class, the load factor in first class is only some 20%. No detailed information is available on peak loading from HS2 and the limited information available from Network Rail’s July 2011 WCML RUS shows¹ two services daily with standing passengers on weekdays, rising to ten services on Fridays, out of a total of 287 trains daily. The RUS confirms that standing is concentrated on the first departures from Euston after 1900 in the evening; this is largely an artificial peak, as these are the first trains on which the regulated “off peak” return (the previous “Saver”) is available. Current load factors on WCML are only c50%, compared with SNCF’s TGVs at c70%, and airlines at 80-90%. This entirely contradicts the statements both by DfT and Network Rail that WCML has major capacity problems at the present time.

40. However, even accepting that there will be an increase in demand in standard class that spreads beyond the 7pm current peaks, such increased demand can be met by a series of relatively straightforward and cheap incremental interventions. These are set out in detail in the response to question 2 below, but in summary; there is already provision being made for significant increased capacity to Birmingham through the Chiltern upgrade (Evergreen 3); on the West Coast Main Line, for example, trains can be lengthened from 9 to 12 cars (11 cars only to Liverpool, because of physical constraints) and one or more of the first class cars can be reconfigured as standard class, giving a total 181% increase in in standard class capacity before any significant infrastructure investment. With targeted infrastructure investment to ease specific pinchpoints on the route, enabling some increase in frequency, a total increase in standard class capacity of 215% can be achieved. This, together with the use of smart IT to increase load factors, would meet any conceivable future increase in demand. Similar approaches have been identified for other InterCity routes.

Other capacity improvements

41. In contrast to London InterCity routes, non-London services are much slower and less competitive with road and, for longer distances, air. There is a

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<http://www.networkrail.co.uk/browse%20documents/rus%20documents/route%20utilisation%20strategies/west%20coast%20main%20line/westcoastmainlinerouteutilisationstrategy.pdf> (Page 48)

real need to cut journey times here, potentially delivering major modal shift and significant environmental gains.

42. Improvements to non-London services would also directly benefit the regions, in marked contrast to HS2, which most serious economists working in this field believe is likely to exacerbate, not reduce, the North – South divide. Liverpool – Manchester – Leeds is an obvious example. Investment to electrify the route and raise the current severe speed restrictions would greatly reduce journey times and deliver agglomeration benefits across the North, with no “leakage” to London and the South East. The current standard of Liverpool – Manchester rail services illustrates this challenge dramatically – services today are no more frequent and slightly slower than in 1910, over a hundred years ago.
43. It is also important to bear in mind that HS2 provides no additional capacity north of Manchester/Leeds. Therefore on the basis of the induced demand predicted by the DfT there would actually be increased overcrowding and a less good service to Scotland and the North East.

Impact of HS2 on existing services

44. The provision of HS2 will actually make existing services to many important locations significantly worse. In addition, the HS2 case is based on no investment beyond those already committed by 2015 on the WCML, MML or ECML, until the completion of HS2, so these routes will see no incremental improvements until 2026 (WCML) and 2033 (MML, ECML). So, for example, overcrowding currently exists on the commuter route between Northampton/Milton Keynes and London but will not be addressed by the HS2 option until 2026 at the earliest when Phase 1 of HS2 is proposed to open.
45. HS2 results in the WCML having only an average load factor of 31%. This would be a wasteful and uneconomic outcome: £9bn has recently been invested in this route to make it the most modern in the UK. Such a situation is totally contrary to the views of the McNulty review.
46. If HS2 is adopted there will be capacity and/or frequency reduction to some cities, for example Coventry, Wolverhampton, Stoke-on-Trent, Leicester, Chesterfield, Peterborough and Doncaster. These reductions are included in the business case for HS2, because there is an assumed saving of around £5bn (NPV) in operating costs. Any promises to maintain existing service levels to these cities would have serious impacts on the business case.

47. As Heathrow Express (HEX) trains are to stop at Old Oak Common, all GWML services will also have to stop - otherwise capacity on the route will be reduced. This would add approximately 5mins to all journey times to/from the West and Wales. Again there appears to be no account taken for this passenger delay in the business case.

Economic Growth and regeneration

48. The critical point is not whether there will be any economic benefits, 51m accepts that there will be some, but whether far greater benefits to the northern economies could be produced by other, and less expensive, public investments.
49. The DfT now place great emphasis on the desirability of “rebalancing the economy”, and “reshaping the economic geography” of the UK. It is well established in the academic literature that the benefits of high speed rail between regional centres and a dominant capital city are likely to accrue significantly more to the capital than to the regions. Essentially the argument is that if you provide very good transport links from the hub to spokes, there is some benefit to spokes but most benefit to the hub. So regional centres will gain something but most of the gain will fall to London and SE, as by far and away the strongest areas of the national economy. Even on the DfT’s case 7 out of 10 jobs are created in the South East and twice as many new trips are generated to, compared with from, London.
50. Evidence² suggests that HSR stations are likely to create “satellite cities” with a general tendency towards the concentration of economic activity towards these major cities, this centralisation³ can be at the expense of more remote areas of a region that were previously sheltered by distance and may be exposed to competition with larger and more efficient entities that are centrally located. Potentially these remotely-located services will feel the need to move into the more centrally located areas to be able to compete.
51. If Government wishes to prioritise rebalancing the economy, and regenerating the Northern cities, then the way to achieve this is through significant investment in transport between the northern cities, and within their travel to work areas. This has been the clear aspiration of those regions as set out in the Northern Way strategy and transport priorities.

² Examples come from two papers: DG Mobility, *High Speed Europe – Sustainable Links Between Citizens* (2010) and Ginés de Rus (Ed.), *Economic Analysis of High Speed Rail in Europe* (2009)

³ OECD report, “*Impact of Transport Infrastructure Investment on Regional Development*”,

52. Daniel Graham of Imperial College Centre for Transport Studies, who we understand to have been instructed by the HS2 Ltd, has considered the evidence on wider economic impacts of HSR in Great Britain and concludes that

“the potential order of magnitude of the agglomeration benefits is small”.

53. It is not surprising that a number of businesses support the concept of HSR when they are not being asked to pay for it, even though according to HS2 Ltd business users will be the main beneficiaries.

Freight

54. The Consultation Document highlights the need to increase capacity on WCML to deal with increasing freight traffic. Freight traffic uses the “slow” lines during the daytime, and would not be affected by increased InterCity services provided pinchpoints have been eased (chapter 6). In addition, the current upgrade of the Felixstowe – Nuneaton route will allow diversion of over half the existing freight trains south of Rugby, creating significant capacity for future growth. Our response to question 4 examines this issue in more detail.

International Comparisons

55. The DfT place great reliance on international comparisons to support its case for HS2 and often states that the UK is a long way behind in terms of HSR. It is therefore important to consider how the UK compares with countries who have implemented HSR. There are fundamental differences between virtually all HSR networks and the UK: elsewhere rail journey times were much slower pre-HSR than in the UK, whereas WCML is a modern 125mph railway; post-HSR journey times were all more than **halved**; and with the exception of Frankfurt - Cologne the distances are much longer. The table below sets out the impact of HSR routes on journey times for a number of international networks.

TABLE 1 IMPACT OF HSR ROUTES ON INTERNATIONAL JOURNEY

	Distance	Pre – HSR	Post – HSR	Journey Time Savings
Tokyo – Osaka	515km	6hrs 30mins	3hrs 10mins (now 2hrs 30mins)	4 hrs
Beijing - Shanghai	1463km	10 hrs 30 mins	5 hrs	5hrs 30 mins
Madrid – Seville	472km	6hrs 30mins	2hrs 45 mins (now 2hrs 30 mins)	4hrs
Paris – Lyon	431km	4hrs	1hrs 55 mins	2hr 5 mins
Frankfurt – Cologne	180km	2hrs 20 mins	1hr 2 mins	1hr 18mins
London – Manchester	296km	2hr 08mins	1hr 13 mins proposed (from 2032)	55mins
London – Birmingham	182km	1hr 24 mins	49 mins proposed	35mins

56. On the face of it, the Cologne – Frankfurt route appears to be equivalent to London – Birmingham, at essentially the same distance. However, Cologne – Frankfurt is part of a much wider network, with almost all trains going to or coming from somewhere else, as part of longer distance routes such as Amsterdam – Basel and Dortmund – Munich. The HSR route also gives proportionately much greater time savings than HS2 to Birmingham, with Cologne – Frankfurt times of 62 minutes, compared with timings on the tortuous classic route of 140 minutes. But London – Birmingham is only 84 minutes today, and Virgin Trains say that they could deliver 70 minutes on the existing track.

57. There are in fact important lessons to be learnt from the international comparisons. The Dutch HSR has financial problems, the Chinese have just reduced speeds to reduce energy costs, the Taiwanese HSR is not attracting the forecast passengers as many are using the cheaper classic services, the President of SNCF has stated that the network is decaying as investment is focused on TGV lines. Distances between stations on TGV lines are much greater than in the UK, and in Germany the classic network is slow and not comparable with the UK mainlines.

58. This is consistent with what Sir Rod Eddington found in his 2006 study. He then states

'...with [rail] journeys between London and other UK major cities performing particularly well relative to journeys from other European capitals'.

Enhancing rail performance and CO2 emissions

59. 51m finds it very strange that none of the consultation questions asks about HS2's performance in respect of climate change. The Government policy on climate change is to reduce CO2 emissions and other Greenhouse Gasses (GHGs) Transport forms a major part of the UK's carbon emissions and must be a key area for action if CO2 emission reductions are to be met.

60. In terms of carbon emissions the DfT's own case is that HS2 does not offer savings in CO2 emissions: it will overall be only carbon neutral at best and significantly carbon negative for Phase 1. Given the massive public investment in the scheme, the importance given by the Government to climate change and the need to reduce carbon emissions and the overall contribution of transport to carbon emissions, it seems bizarre that the Government should support a scheme with no carbon benefit.

61. In any event for reasons given below at para ... the view that HS2 will be carbon neutral is itself highly optimistic. On DfT's case, HS2 also generates a very large number of new trips, i.e. people who are not currently choosing to travel, and only achieves 7% of HS2 passenger are forecast to transfer from car and 6% from air. Emerging Government policy is to encourage people to travel less, and to prioritise schemes which achieve a reduction in carbon emissions. HS2 does neither.

Conclusions

62. There is likely to be a good case for incremental improvement in capacity and performance to the already generally high quality London InterCity services, and a major opportunity to deliver a step-change improvement on the much poorer non-London InterCity and interurban routes. Both can be achieved at much lower cost and deliver much better value for money than the proposed HS2 project, with greater direct benefit to the economy outside London and the South East.

Q2: Do you agree that a national high speed rail network from London to Birmingham, Leeds and Manchester (the Y network) would provide the best value for money solution (best balance of costs and benefits) for enhancing rail capacity and performance? – refer to appendices 1,2 & 3

63. The focus of this question appears to be on the accuracy of the economic case set out in the consultation documents. 51m have tried to deal with the main concerns raised by the business case. However it is an obvious fact that the Government has at its disposal far greater resources than 51m, and a wide range of experts. The burden must be upon the Government to carry out a thorough and objective investigation into the business case for HS2. Probably our greatest concern arises in respect of the alternatives. Despite its huge resources and access to the rail industry, the DfT has failed to properly examine alternatives, and therefore has presented a thoroughly distorted business case for HS2. 51m has carried out an initial consideration of such alternatives, but obviously with only limited resources and expertise. It may well be that there are still better alternatives, or that some aspects of our work is open to criticism. This is a task which should have been carried out in the most scrupulous manner by the DfT. Until this work has been undertaken it cannot be appropriate to proceed with HS2

The economic case

64. There are a number of key areas where the DfT's economic case for HS2 is seriously flawed, and not in accordance with the DfT's own good practice/guidance. 51m have undertaken independent assessments of the economic and business case, within the constraints of the available information, which reach very similar conclusions. This analysis has been done on the London – West Midlands case as there is a lack of detail for the full Y and our understanding is the Y analysis is just a scaling up of the London – West Midlands case. We refer to each of these below, and also produce an analysis of the impact on the BCR if a number of these factors are approached correctly and conclude that HS2 can be nothing but very poor value for money. The failure to carry out proper sensitivity analysis is one of the serious flaws. In summary the key flaws are identified below and covered in more detail in the following sections;

- a) The use of unrealistic comparators and the failure to optimise the alternatives;
- b) The over optimistic demand forecasts based on;

- i. Optimistic assumptions about GDP growth and income growth;
 - ii. Failure to consider the impact of technological alternatives to travel;
 - iii. Inflated income elasticities based on Passenger Demand Forecast Handbook 4.1, which is both inappropriate and out of date.
 - iv. Inappropriate use of short term model and arbitrary⁴ doubling in background demand growth.
 - v. Unsafe reliance on rail travel growth since 1994;
 - vi. Failure to take into account the impact of pricing, eg on Chiltern Railway, on the level of demand for HS2.
- c) The assumption that HS2 can run 18tph, for which there is no evidence.
 - d) The failure to include in the business case the inevitable costs of providing Crossrail Line 2 (or alternatively the huge economic cost of overcrowding in Euston underground station and the Victoria Line);
 - e) The failure to include the disbenefit of service costs, eg the extra time spent by GWML passengers at Old Oak Common.
 - f) Overvaluation of the benefits based on;
 - i. Inflated assumed incomes of the “beneficiaries”;
 - ii. Grossly distorted values given to business time savings from faster rail journeys, without which there is no case for the speed of HS2;

Unrealistic Comparators Have Been Used and Alternatives Have Not Been Optimised

65. Probably the most fundamental problem with the DfT’s economic analysis is that they have not used the best alternative as their comparator with which to test the business case. They have used a wholly unrealistic ‘do-minimum’ comparator which assumes almost no changes to rail services over 30 years. Given the current level of overcrowding on commuter services, e.g. London to Milton Keynes/Northampton this is not a realistic proposition. The DfT’s principal alternative, Rail Package 2 (“RP2”), is equally unrealistic. It fails to optimise the opportunity for extending and reconfiguring trains; includes unnecessary and costly infrastructure; and fails to apply a consistent approach to necessary infrastructure when comparing RP2 and HS2. This is

⁴ Oxera Review of the Governments case for a High Speed Rail programme paragraph 3.16

contrary to basic principles on carrying out a business case such as this, and has led to a wholly distorted picture as to the need for, and benefits of, HS2.

Optimised alternative

66. Forecasting is not an exact science and quantification of the level of passenger growth, how time is spent and the value of time saved are inevitably open to subjective judgement.
67. But it is a simple fact that huge increases in capacity can be produced on the relevant parts of the rail network by taking relatively simple and far cheaper steps than HS2. These steps also have the benefit of being able to deal with crowding problems earlier.
68. There are a series of incremental improvements to the existing network which can deliver more than enough capacity to meet forecast demand. These steps have four major advantages over HS2. First; because they are incremental there is no wasted investment if the massive demand increases forecast by HS2 do not materialise. Second; they are far cheaper than HS2. Third; they can be introduced much more quickly than HS2, so can deal with existing overcrowding problems, rather than having to wait until 2026 (at the earliest). Fourth; they are very low risk and are more likely to be commercially justified.
69. In summary, the incremental ways to increase capacity over the DfT base case (“the Optimised Alternative”) are:
 - a) Take account of “Evergreen 3” (line speed increase from London Marylebone- Birmingham on the Chiltern Line), which will be completed this year and provides journey speeds to Birmingham only a few minutes longer than those on Virgin trains, thereby reducing demand from Euston and increasing capacity including at peak times. The Chiltern Line serves a number of key West Midlands catchment areas and is likely to be a very attractive alternative to WCML, particularly as “walk on” fares are half the level of those on the Euston route. Further, the Chiltern service is, and will remain, significantly cheaper than WCML and therefore HS2. It now appears that DfT/HS2 have ignored the price impact on demand because their PLANET model does not differentiate between alternative routes by price. (A Munro letter 29th June ref) Therefore not only just was Evergreen 3 explicitly ignored in the DfT business case, but their approach to demand forecasting is totally unrealistic. It is obvious that price is a critical factor in the decision as to which route to use. This

must be particularly the case where 70% of the usage on HS2 is leisure, which will be highly price sensitive.

- b) Change the train configuration on Pendolinos to reconfigure at least one carriage from first to standard. The overcrowding issues only arise in standard class.
 - c) Lengthen all existing Pendolinos to 12 cars (except for Liverpool, which would still be limited to 11 cars).
 - d) The combination of (b) and (c) produces an additional 4 standard cars per train - 9 standard cars per train, in contrast with 5 today.**
 - e) Introduce “smart” ticketing and demand management, to smooth peak demand, for example by eliminating the artificial peak on Friday after 7pm at Euston.
 - f) Carry out a series of relatively minor infrastructure capacity improvements at “pinch points,” including a grade separated junction south of Milton Keynes, to allow improved separation between fast and slow lines.
70. The cumulative capacity increases of these measures over the 2007/8 base case demand would be in the order of **trebling** capacity (215%), at a total capital cost in the region of £2bn. Of course these steps would not provide the faster journey time of HS2. But once it is understood that the majority of the benefits from the journey time reductions are dependent on the assumption that business people do not work on trains, it can be seen that spending £30bn (NPV) for this gain is a very poor use of public money.
71. Figure 1 sets out, in tabular form, the increase in capacity which could be achieved by an Optimised Alternative using the WCML.

FIGURE 1 INCREMENTAL INTERVENTIONS FOR OPTIMISED ALTERNATIVE

Interventions	Daily Trains	Daily Standard Class Seats	% Increase above 2008 Base	Comments
Train Investment with no/little Infrastructure Investment				
HS2 2008 Base		59,298		Base used by DfT for evaluation of HS2. Predates full WCML upgrade timetable.
Current timetable	286	81,924	38%	Includes Voyager services (30 daily)
Evergreen 3	[64]	[35,200] ⁵	[100%]	Committed scheme – complete in 2011 Illustrative numbers – excluded from totals
Committed lengthening project	286	105,924	79%	Committed scheme – implemented from 2012
December 2013 additional services	306	113,769	92%	Additional hourly off-peak train each way
First class reconfiguration	306	134,379	127%	One car converted from first to standard
12 car sets (except Liverpool)	306	166,908	181%	Major physical constraints at Liverpool
Infrastructure Investment				
Additional services	336	186,648	215%	34 additional daily trains following investment to relieve pinchpoints

72. In answer to the Government’s concern about disruption to the WCML during the recent upgrade, it is important to stress that the alternatives examined by 51m are in no way comparable and would cause minimal disruption to the WCML and no disruption to Euston, whereas HS2 will cause massive disruption at Euston for 7/8 years.

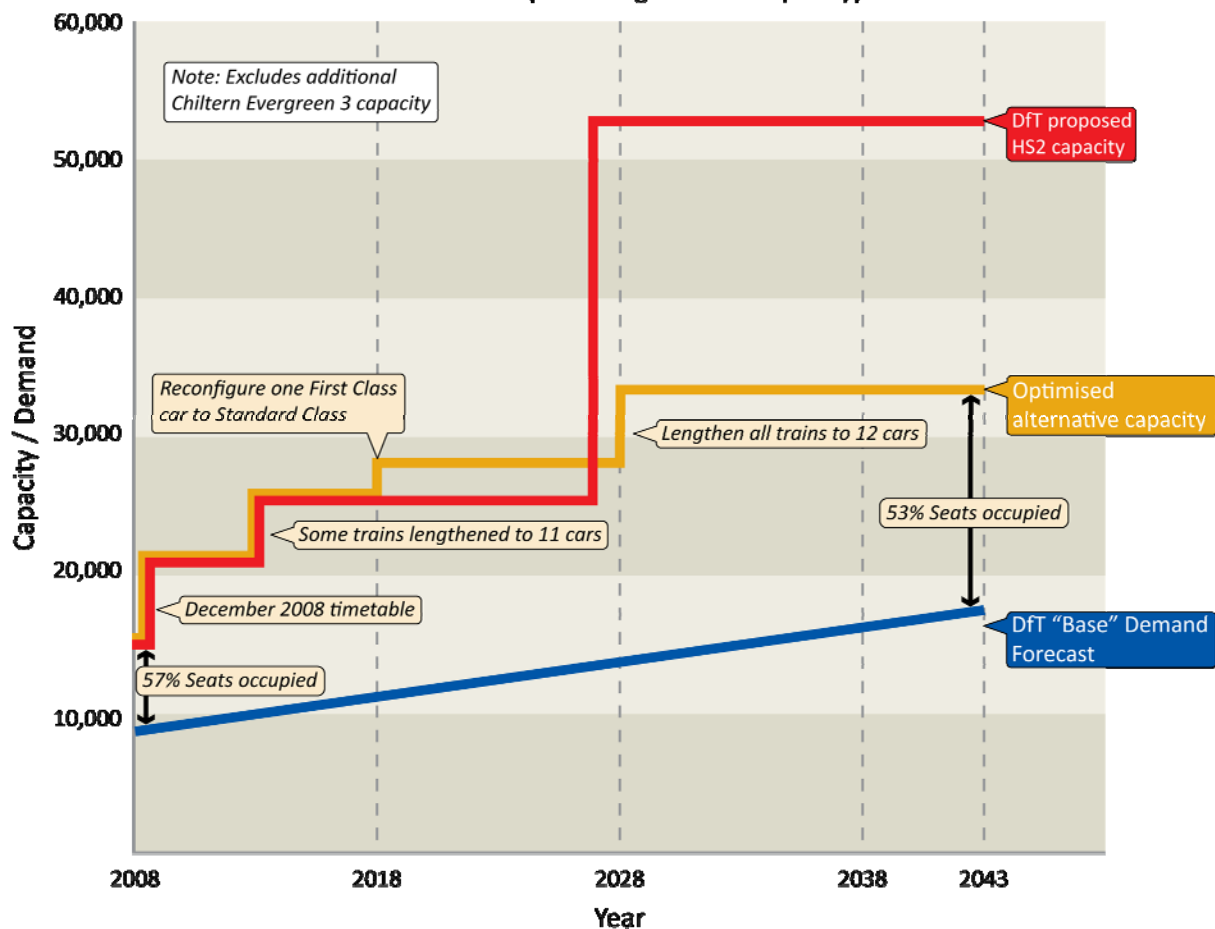
73. HS2 Ltd and its supporters have argued against RP2 (and presumably by analogy the optimised alternative) on the ground that it does not deliver capacity in peak periods. There is no detailed data to support this assertion

⁵ Illustrative Evergreen 3 figures assume Chiltern trains currently 4 car class 168 units (275 seats), lengthened to 8 car class 168 (550 seats)

and the alternative detailed in Figure 1 above provide a 200% increase (treble) in capacity over the 07/08 base in its own right, when HS2 only predict a 102% increase in demand

74. Much the greatest overcrowding out of Euston currently occurs on commuter services between Euston and Milton Keynes and Northampton. Construction of a grade separated junction south of Milton Keynes at a cost of less than £300 million and introduction of new rolling stock would allow peak capacity to be doubled in c5 years. In contrast, HS2 would deliver no benefits until 2026 at the earliest.
75. Of particular relevance to HS2 Phase 1 is that the current demand between London and Birmingham New Street and International is 5000 passengers per day per direction, and HS2 predicts this to double by 2043. Future demand between Euston and Birmingham can easily be accommodated by the alternatives. HS2, on the other hand, would massively over-provide to Birmingham, potentially offering 55,000 seats per day, as shown in the graph at Figure 2.

Figure 2: London – Birmingham: Future capacity and demand (excluding Chiltern capacity).



76. This further demonstrates that the Optimised Alternative can meet forecast peak demand and that HS2 is not justified on the grounds of meeting forecast capacity requirements.

The ‘do minimum’ base case against which HS2 has been evaluated is unrealistic.

77. The assessment of HS2 is carried out against a ‘do minimum’ case. This means no improvement to capacity or services beyond those already committed⁶. This is unrealistic as there is current serious overcrowding on commuter services: use of a ‘do minimum’ implies ignoring all the opportunities for improvements.
78. This approach seems inconsistent with DfT’s guidance⁷ that envisages addressing anticipatable problems within the ‘do minimum’ case.
79. Demand/capacity is not managed to reduce overcrowding⁸, for example by changing current pricing policy to minimise price induced demand peaks. It is inconceivable that if Government/the rail industry were faced with further substantial increases in demand that it would fail to take any action to mitigate high levels of overcrowding.
80. By assuming an unrealistic “do minimum” case, high benefits from crowding relief and service frequency improvements are artificially created for HS2 by the improbable assumption that the crowding would otherwise be left unaddressed.
81. The appropriate test should be whether HS2 is better than the ‘best’ alternative. The Optimised Alternative set out above is a series of relatively low cost capacity improvements on the existing network, and these improvements will either be commercially viable or have a high BCR. It represents a far more realistic base case than the DfT ‘do minimum’ scenario and is therefore a more appropriate comparator.
82. Importantly in the DfT reassessment of the alternative RP2, DfT changed the basis of the “do minimum” comparator (extending all trains to 11 car) from

⁶ On WCML this involves extending part of fleet to 11 car, 4 new sets and IEP. It however excludes Evergreen 3, which reduces the Birmingham London journey time on Chiltern Railways, and will therefore win business from WCML, delaying the requirement for any additional WCML capacity.

⁷ Wehtag unit 2.5

⁸ ‘.....Do Minimum matrices for rail (and road) are estimated by uplifting constrained (i.e. ex-post / observed) 2007/8 demand for exogenous influences only, with no attempt to estimate levels of underlying unconstrained demand, or the effects of changes in supply/congestion occurring after 2007.’

that used for the “do minimum” comparator for HS2, this results in an underestimate of the benefits and BCR for the RP2 alternative, which 51m consider would certainly be in excess of 2.0 if treated on the same basis as HS2. HS2 own report states *“The additional capacity was added into both 2021 and 2043 models. As a result of these assumptions, forecast WCML crowding levels in 2043 in the do-minimum scenario are somewhat lower than those forecast by HS2 Ltd. This assumed additional capacity may result in some demand, and thus benefits for the alternative packages potentially being excluded”*.

HS2 Demand Forecasts

83. DfT forecast is for 102% “background” demand growth to 2043, and 209% including the additional growth generated by HS2. The DfT describe this as “conservative”, but that is misleading for a number of reasons.
84. Firstly, the DfT growth figures rely on an optimistic analysis of UK GDP⁹ growth, which is materially higher than that of most independent forecasters and fails to take account of the “sluggish” performance of most Western economies and that economic forecasts have consistently been revised downwards for 8 successive periods. This factor could make a large difference to the overall business case, and it is wholly unsafe to base large public investment on such optimistic forecasts. This validity of this view is highlighted by the significant impact of changes in growth predictions in the business case made by HS2 Ltd between the 2010 and 2011 analysis, which reduced the BCR substantially. This factor is compounded by the assumption that real incomes per capita will grow in line with GDP growth. In the light of factors such as pressure on wages from international competition and upwards price pressure, this another very unsafe assumption.
85. Secondly, there is no acknowledgement of the role of technological change in reducing the need/demand to travel. There is strong evidence that the growth of “telepresence” and other communications technology is likely to increasingly reduce business travel. It is surprising that the DfT have not taken this into account given their policy support for encouraging people not to travel
86. Thirdly, the DfT have used inappropriate income elasticities in order to conclude that as income rises people will travel more. The DfT have used Passenger Demand Forecasting Handbook (PDFH) 4.1 rather than the up to

⁹ Appendix 3 - CEBR Business Case review July 2011

date version PDFH 5, which has a significantly lower ratio of income growth to rail demand growth.

87. Fourthly, the DfT have also extended the demand growth forecast period from 2033 in the first evaluation, to capping it in 2043 in the current evaluation. Fortuitously, this allows the DfT to maintain the doubling of demand, but 10 years later. This extension of demand growth to 2043 is contrary to DfT's own guidance which would cap the growth at 2026 and to the most recent Webtag Guidance which makes entirely clear that the numbers in the HS2 analysis are inappropriate. The recent Oxera report for the Transport Select Committee (para 3.16) states that "the justification for this cap is somewhat arbitrary; however HS2 Ltd has tested scenarios which show that the implementation of this cap has an important impact", and that if demand was capped at 2026 the BCR would reduce to 0.7.
88. Fifthly, the DfT are relying heavily on growth in rail travel since 1994 as a guide to future growth. But this must be seen in the context of overall long distance trips on all modes per person remaining constant since 1995; no rail growth in the period 1952-1995; and rail travel being strongly influenced by investment (including public subsidy) post privatisation. It is wholly unsound to assume that the factors which led to rapid growth post 1995 will continue to 2043.
89. Sixthly, it now appears that the DfT's assumptions about demand for HS2 have not taken into account differential prices with competitor services. This must undermine their business case. To take the example of Chiltern Railways service from Birmingham. This route is between 50-25% cheaper than equivalent services on WCML. In support of this view, the Oxera report to the Transport Select Committee (para 3.20) states in relation to fare levels on the conventional and high speed services that "it seems unlikely that the optimal fare strategy will be equivalent prices between two types of services". This is particularly important given that leisure trips, which are generally price sensitive, make up 70% of the HS2 passengers. This will have an inevitable effect on demand for the service, but HS2 now acknowledge that the DfT model does not take fares into account.

Rail Industry History of Poor Forecasting

90. 51m's concern that the passenger forecasts are seriously over optimistic, is strongly supported by the rail industry's very poor record on forecasting demand for major rail projects. CTRL (now HS1) predicted demand in 2006 of 25 million passengers, whereas the actual traffic is around 9 million. The

Public Accounts Committee in 2006 reported that the DfT had told them that they had learnt from their mistakes and next time would factor in more severe downside assumptions, but they have notably failed to do so, on HS2.

18 trains per hour

91. The DfT's business case rests on their assumption that HS2 can carry 18tph. This is fundamentally unsound;
- It has never been achieved elsewhere;
 - Rail experts don't believe can be achieved and
 - It is even less likely to be achieved when lines are not entirely segregated and there are trains coming off the classic lines.
92. This issue is dealt with in detail under the response to Question 4, but the inability to deliver 18tph is one of the fundamental flaws in the business case.

Additional costs not taken into account

93. The DfT business case does not take into account key pieces of infrastructure which will be required in order to make HS2 work. The largest single issue here is the inability of the extra passengers brought into Euston on HS2 to disperse. The effect of HS2 will be to shift large numbers of passengers from Kings Cross and St Pancras to Euston, and generate a large number of new trips. A very high proportion of these passengers will wish to travel from Euston on the underground, and there is no capacity for them to do so. TfL stated at the Transport Select Committee hearing on the 28th June 2011 that with the full Y network the Victoria & Northern Lines at Euston would not be able to cope with the extra demand generated by HS2. In these circumstances HS2 simply cannot operate without steps being taken to increase capacity on the underground network at Euston. We understand the only solution to this problem to be the provision of Crossrail Line 2 (previously known as the Chelsea Hackney Line). This will cost upwards of £9billion.
94. We understand that DfT do not disagree that there is a lack of capacity at Euston, but the argument appears to be that Crossrail Line 2 would be needed in any event. Whether or not this is correct, the fact is that HS2 will make it essential. Therefore the DfT cannot rationally proceed with this project without an unequivocal undertaking that if HS2 is built, then Crossrail Line 2 will be opened at the same time (or before). This fundamental

requirement must be included somewhere in the HS2 business case, whether in its entirety or as proportionate share.

95. It should also be recognised that the alternatives that increase capacity on the WCML combined with the Chiltern line, whilst maintain the ECML and MML services to their current terminal stations, spreads the peak loading on the tube network across 4 mainline London station: Kings Cross for ECML, St Pancras for MML, Euston for WCML and Marylebone for Chiltern. Of particular importance is the Chiltern line which will provide extra capacity between Birmingham and London, as the Bakerloo line at Marylebone has the most capacity spare of any tube line in London.

Benefits of HS2

96. DfT have also seriously overestimated the economic benefits of HS2. The key benefit of HS2 in its economic case is the value of shorter journey times, which accounts for £18bn of the £44bn benefits. £14bn of this depends on the assumption that time savings translate into greater productivity for business travellers. This is because in the economic case the DfT have assumed that time spent on trains is wasted, and have taken no account of modern technology which allows business travellers to use train time productively. These assumptions are simply wrong. Current business practice shows beyond doubt that time spend on trains is used productively, and further technological advances will further improve this situation. Therefore in this respect the economic case is unsustainable.
97. This error has important implications for the entire case for HS2. If there are very limited benefits from faster journeys, because people work productively on trains, then the entire justification for high speed rail with its enormous environmental damage, disappears. There is no, or very little inherent benefit in high speed over the classic (already fast) services. It is important to emphasise that this issue alone undermines the case for HS2, as without journey time savings and once the Optimised Alternative meets the crowding need, there is no case left.
98. The DfT seek to rebut this by saying that if one does assume that time on trains is used productively then that is simply recovered by the benefits of reducing overcrowding. But this is flawed. The much cheaper alternative proposals have lower levels of crowding than HS2 (HS2 predicts load factor of 58% in 2043, whereas the Optimised Alternative has about 52% and even the DfT alternative RP2 has 51%) , and can provide additional capacity sooner. Therefore the purported benefits of crowding relief do not exist.

99. The unit costs are another issue because, with increasing rail business travel, the higher numbers of trips require a broader base of travellers to make them. The near quadrupling in business travel forecast assumed for HS2 between 2008 and 2043 (against a population increase of just 22%) must be expected to involve business travellers to have a lower average income than is presently the case. It becomes unreasonable to assume that such travellers could be composed predominantly from the earnings elite, as DfT's figure does (their figures translate into £70k/a salary in 2009 money).
100. A reduction of earnings to the average for 'Managers and Senior Officials'¹⁰ (at £47k) would still put earnings into the top decile, but reduce the level by a third. This change would by itself remove about £7bn from the £44bn benefits, as it affects time savings and reliability.
101. Importantly the DfT in the business case has ignored price competition from the classic network which post HS2 will have a great deal of spare capacity. Passengers, particularly leisure passengers, are sensitive to price. It is inconceivable that the classic network (both WCML and the Chiltern Line) will not compete on price with HS2. The failure to take into account the effect of such price differentials on the level of demand is a very serious flaw in HS2's demand forecasts. The DfT have wholly failed to model this effect.
102. In practice it is difficult to see why those who are getting the benefit from high speed rail should not be paying premium fares for those benefits, or to believe that this will not happen in practice. But the DfT business case rests on there being no premium fares, and the shortfall being made up by public subsidy. Without this assumption the business case would fall much further because the passenger forecasts would reduce significantly, particularly given the sensitivity of leisure passengers to price.
103. 51m has undertaken a series of sensitivity analysis on London – West Midlands case to see what happens to the economic case if more realistic assumptions are taken than the DfT's. These are set out in detail in [appendix 3](#) but in summary they show;
- The growth assumption adjustment made by HS2 Ltd between the 2010 and 2011 versions of the business case have had a dramatic effect on the BCR reducing it from 3.24 to 1.6. The continued downward trend in forecasts will reduce the BCR even further.

¹⁰ ASHE 2009 (ONS survey) mean gross annual average earnings for occupation code 1 ((£47k)

- The impact of using more appropriate elasticities from PDFH 5.0 reduces the BCR from 1.6/1.9 (without and with wider economic benefits) to 1.3/1.5. It should be noted that this sensitivity test does not even include capping growth before 2043, which as demonstrated by Oxera has a dramatic effect on the BCR with it being reduced to 0.7 if the cap is applied in 2026
- If the benefits from shorter journey times and reduced income assumptions are halved¹¹ then the BCR falls from 1.6/1.9 (without and with wider economic benefits) to 1.2/1.5.
- Combining the changes to elasticities from PDFH 5.0 together with the reduction in journey time benefits reduces the BCR from 1.6/1.9 (without and with wider economic benefits) to 1.0/1.1
- Adding the reduction in crowding benefits to the above further reduces the BCR to 0.7/0.9 (without and with wider economic benefits)
- And finally changing the assumptions on WEI. in accordance with the findings of the Daniel Graham report for HS2 Ltd. further reduces the WEI BCR to 0.7

Conclusions

104. For the above reasons we fundamentally disagree with the statement in Question 2 and are strongly of the view that HS2 is not the best value for money and alternatives are much better”

- Demand growth predicted by DfT on the classic network can be provided for by increasing capacity on the WCML as a when required, predominately by lengthening and reconfiguring trains with limited infrastructure. This argument is strengthened even further when the Chiltern Evergreen 3 project, being delivered this year, is taken into account. A low risk and better value for money solution.
- The inability to run 18tph on HS2 will have a significant negative impact on the HS2 business case
- There are serious flaws in the assumptions upon which the benefits analysis has been undertaken, in particular the value of time “saved” on

¹¹ Similar assumption to that made in Oxera Review of the Governments case for a High Speed Rail programme

trains, and the value ascribed to business travellers and these **fundamentally undermine the economic case for HS2.**

- There are serious concerns about the demand forecasts produced by DfT which leads to the conclusion that the lessons of previous optimistic forecasts have not been learnt. Sensitivity tests and more severe downside assumption should be factored into the evaluation, which would have a major impact on the business case.
- The use of an appropriate “do minimum” case would significantly reduce the benefits of HS2
- If HS2 and alternatives were compared against the same base, the case for HS2 would be weaker
- Even with conservative adjustments for these failings, the overall business case for HS2 would be seriously undermined and would be very poor value for money.

105. Our analysis has focused on the London – West Midlands element of HS2. The level of detail provided by HS2 Ltd on the Y is totally insufficient to make any reasonable assessment of the value for money case and we also understand that the information that has been produced is predominantly derived from a scaling up of the case for the London – West Midlands. We understand that a full business case for the Y is to be published later this year. However, the issues that we have with the assessment of the business case for the London – West Midlands element still hold good for any assessment of the Y and thus we believe that the real BCR will be less than half that predicted by HS2, in line with our evaluation on London – West Midlands, thus demonstrating that it will not be the best value for money.

Q3: Do you agree with the Governments proposals for a phased roll-out of a national high speed rail network, and for links to Heathrow Airport and to the High Speed 1 Line to the Channel Tunnel – refer to appendices 11 & 12

106. This question appears to raise three issues;

- The implications of the phased roll-out
- The case for linking to Heathrow
- The case for linking to HS1.

Phased roll out

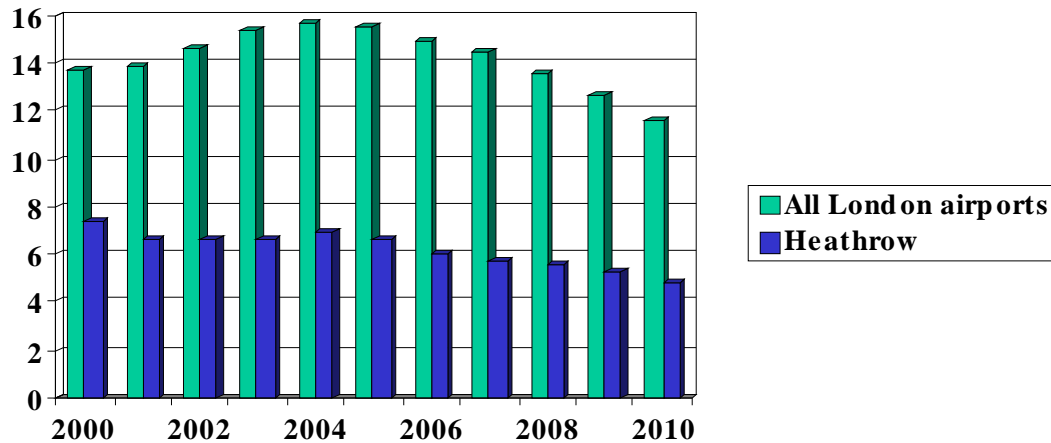
107. The approach to the decision to proceed and of benefits/disbenefits being on a phased basis is completely flawed. This is because of the lack of detailed information on the “Y” north of Lichfield. Without this information it is impossible to judge whether the project as a whole is justified or not or whether a phased roll out is justified or not. Phase 1 alone is plainly unviable on every rational basis. Therefore it is wrong in principle to decide to proceed with HS2 until there is full consultation on the whole Y. It is 51m’s strong view that the principle of HS2 will have to be re-visited if and when there is consultation on the Y.
108. Any phased roll-out presents a serious risk of the line being built to Birmingham and then no further, because of the disbenefit of the Y. A line to Birmingham alone would be a very expensive white elephant.

Impacts on Aviation

109. The issues of linking HS2 to Heathrow and HS1 are driven by the impacts such services will have on aviation as well as the business case for such links.
110. The DfT forecast only 6% of HS2 passengers are switching from air. Domestic demand to all London airports has fallen by 26% since 2004 and it is therefore very difficult to reconcile this with DfT predictions of 128% growth in domestic flight demand to 2043. Journey times from Glasgow/Edinburgh to Paris/Brussels will remain over 6 hours and therefore no modal shift can be assumed.

FIGURE 3 DOMESTIC AIR TRAFFIC TO LONDON AIRPORTS

Domestic air traffic to London airports has been declining since 2005 (CAA data)



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111. Experience from elsewhere in the world indicates that the introduction of high speed rail services does not typically result in the withdrawal of parallel air services – there are still frequent flights from Tokyo to Osaka, Paris to Lyon and Madrid to Barcelona. It is interesting to note that even on Madrid-Barcelona, where the high speed rail link reduced journey times from around 6 hours to 2 hrs 40mins hours, there remain 25 flights per day, each way, on the route.

112. A supporting argument often used for the HS2 connections to both Heathrow and HS1 is that it will reduce domestic air travel and thus have significant carbon emission benefits; however it is clear that the aviation industry has a different viewpoint. Nigel Milton, Director of Policy and Political Relations for BAA at Heathrow stated in March 2011;

“No sensible, well-informed person still seriously pretends HS2 is a green alternative to a third runway. The question now is given no third runway, how we can maximise the effectiveness of our limited capacity at Heathrow. That means more long-haul flights...every time BMI or British Airways have cancelled a domestic route in the past they’ve replaced it

with a more profitable medium- or long- haul route. That's exactly what will happen when HS2 comes and more domestic routes get cut."¹²

113. The forecast of HS2 being carbon neutral is itself extremely optimistic and is covered in more detail in our response to question 5, as it rests entirely on high assumptions about modal shift to air and most critically that airport slots which are freed up by the reduction in domestic flights would not be re-used. In relation to Phase 1 the carbon situation will be much worse as there are no domestic flights from Birmingham to London to be reduced. There is no ability for Government to lock in any carbon savings as a result of withdrawal of domestic routes. BMI's recent withdrawal from the Glasgow – Heathrow route has demonstrated this very clearly. BMI has not surrendered the slots previously used for Glasgow flights, but is instead using these for longer European routes, resulting in a net increase in carbon emissions.

Link to Heathrow

114. The Consultation documents published in February 2011 include very little useful information on the business case for the Heathrow link.

115. The main consultation paper High Speed Rail: Investing in Britain's Future"¹³ asserts that there is a

"compelling strategic case for being able to link the high speed network to Heathrow" (page 24)

and that this link should be in the form of a spur, costing between £2.5 – 3.9bn. However, it is acknowledged that operating to Heathrow would have an opportunity cost in terms of capacity to central London, as a spur would mean that a train path to central London would be lost for every train to Heathrow (Page 66). To minimise this capacity impact, it is suggested that Heathrow trains would split/join on-route (presumably at Birmingham Interchange) although operation on this basis would inevitably extend journey times and impact on reliability.

116. In Phase 1 access to Heathrow would only be provided via interchange at Old Oak Common. The Economic Case for HS2¹⁴ provides no more detail for Phase 2 although it is claimed that the assessment of the full "Y" network includes Heathrow (Page 7), but no Heathrow services are shown in the

¹² [ENDS Report 434, March 2011](#), pp. 34-36

¹³ <http://highspeedrail.dft.gov.uk/sites/highspeedrail.dft.gov.uk/files/hsr-consultation.pdf>

¹⁴ <http://highspeedrail.dft.gov.uk/sites/highspeedrail.dft.gov.uk/files/hs2-economic-case.pdf>

“Service specification assumptions for the Y network” (page 61), and there is no published incremental case for the spur. It is not clear whether this is because the work has not been done, or that the evaluation which has been done shows that there is no case for building the spur on any basis of conventional transport economic evaluation.

117. It is however clear from the report prepared by HS2 Ltd for the Labour Government, published in March 2010, that their conclusion at that time was that there was no business case for a direct link to Heathrow, even though it was then Government policy to increase Heathrow’s capacity by building a third runway:

*“...the total market for accessing Heathrow from the West Midlands, North West, North and Scotland is currently around 3.7 million trips. Our modelling suggests relatively little of this would shift to HS2, with the rail share increasing by less than 1 percentage point (about 2000 passengers per day, or **just over one train load each way**)”* (Para 3.3.10).

118. The Manchester air market has already substantially reduced as a result of the improved rail service following completion of the West Coast Main Line upgrade. Rail is now estimated to take c80% of the combined rail/air market¹⁵, as would be expected when there is a twenty minute frequency train service taking just over two hours to central London. The majority of remaining Heathrow passengers are almost certainly interlining. A direct high speed link to the airport could of course be attractive for interlining passengers, but the volumes are insufficient to justify the construction costs, or to sustain a dedicated service: 2010 air passengers between Heathrow and Manchester totalled 799,000, 1095 a day each way. This isn’t enough to justify £2.5 – 3.9 bn for a link to Heathrow, nor the trains to serve it at a competitive frequency.

Link to HS1

119. The Consultation documents published in February 2011 include very little useful information on the business case for direct services to HS1.

120. The main consultation paper “High Speed Rail: Investing in Britain’s Future”¹⁶ states:

¹⁵ ATOC press release 5th April 2011 <http://www.atoc.org/media-centre/latest-press-releases/shift-from-air-to-rail-heralds-turning-point-in-how-people-travel-between-uks-main-cities-100571>

¹⁶ <http://highspeedrail.dft.gov.uk/sites/highspeedrail.dft.gov.uk/files/hsr-consultation.pdf>

“The Government’s view is that the strategic case for a direct link between the proposed high speed rail network and the HS1 line to the Channel Tunnel is strong” (Page 68)

and that this link should be in the form of a single track tunnel from Old Oak Common to the North London Line, then using existing rail infrastructure to a junction with the HS1 route just north of St. Pancras. The estimated capital cost of the link is £0.9 bn.

121. The *“Economic Case for HS2”*¹⁷ provides little more detail. It is claimed that the assessment of the full “Y” network includes the costs and benefits of the link to HS1 (Page 7), but no through services are shown in the *“Service specification assumptions for the Y network”* (page 61), and there is no published incremental case for the link. The only figures quoted are that the daily use of the link to and from the West Midlands would be around 4,850 passengers in 2033, and that the benefits of the HS1 link are £0.4 bn (page 30) – the latter figure is significantly less than the £0.9 bn capital cost of the link.

122. The case is being promoted by DfT/HS2 on the basis of through trains. However, the business case analysis is based on interchange at Old Oak Common in order to catch a train to Paris, Brussels etc. Such an interchange would impose time/convenience disbenefits on passengers, and it would be more advantageous for them to proceed to St Pancras, where there would be a wider choice of destination and greater frequency. In addition in the HS2 business case the costs of building the link are £0.9bn and the benefits are only £0.4bn which clearly is an uneconomic proposition.

123. It is not clear whether a full evaluation of the business case for the link has been done, or if the evaluation showed that there is no conventional transport economic case for building the link. However, it is clear from the report prepared by HS2 Ltd for the Labour government, published in March 2010, that their conclusion at that time was that there was no business case for a direct link to HS1 and there is no evidence provided by HS2 Ltd to change this view:

“Running direct services to Paris or Brussels...would bring Birmingham within three hours and attract a significant market share, but the market would not be big enough to fill a 400 metre train a day in 2033. Direct services to destinations North of Birmingham would attract a smaller

¹⁷ <http://highspeedrail.dft.gov.uk/sites/highspeedrail.dft.gov.uk/files/hs2-economic-case.pdf>

market share but are competing in a bigger market and might fill another train a day” (Para 3.8.12).

It is also clear from The Economic Case for HS2 that

“operating services to HS1 would have an opportunity cost in terms of capacity to central London, as a train path to central London would be lost for every train to HS1.”¹⁸

Market Analysis - Current Position

124. Rail is potentially competitive with air for journey times up to four hours. This essentially means that HS1 through services could be competitive for journeys such as Manchester – Paris and Leeds – Brussels, but are unlikely to win significant market share for journeys which start or end either north of Manchester and Leeds or beyond Paris and Brussels.

125. Existing travel between the English regions and the near continent (Paris and Brussels) is overwhelmingly by air at present, so CAA data gives a basis for assessing the existing market. Comparing air volumes in 2000 and 2010, air traffic on the key potential flows has generally declined, in some cases dramatically. The demand to Paris, which is significantly greater than Brussels, is shown in the following table.

TABLE 2 AIR TRAFFIC BETWEEN PARIS AND ENGLISH REGIONS

Paris	2010 air passengers	% change on 2009	2000 air passengers	% change 2010 on 2000
Birmingham	314,227	-1	377,837	-17
Manchester	441,341	-1	529,410	-17
East Midlands	91,572	-11	101,646	-10
Leeds/Bradford	73,359	-18	55,197	+32

126. This reflects the much wider range of destinations now available from UK airports following the dramatic changes in the market place as a result of low cost airlines – in particular, there is a much greater choice of destinations for leisure travel, so traditional destinations such as Paris are much less dominant.

127. The airlines have reacted to this very effectively, maintaining or increasing frequencies by using smaller planes with low operating costs, and adopting

¹⁸ <http://highspeedrail.dft.gov.uk/sites/highspeedrail.dft.gov.uk/files/hs2-economic-case.pdf>

the low cost model. There are typically six daily flights each way between key city pairs such as Birmingham and Brussels, and Manchester and Paris. Fares are also cheap, £50-70 for Birmingham to Paris if booked three/four weeks in advance. These routes meet market demand, and are not subsidised.

Potential for Rail

128. Assuming that rail is able to offer equivalent frequencies to air, in a “high” scenario it would be reasonable to assume that airlines would cease to operate from Birmingham to Paris and Brussels, and that rail would capture 50% of the rail/air market from Manchester, East Midlands and Leeds/Bradford to Paris, with journey times, for example, of 3 hours 40 minutes from Manchester to Paris. On this basis the potential rail volumes for Paris are shown in the following table.

TABLE 3 POTENTIAL RAIL VOLUMES BETWEEN PARIS AND ENGLISH REGIONS

Paris	2010 air passengers	Rail potential	Daily one way rail flow
Birmingham	314,227	314,227	430
Manchester	441,341	220,671	302
East Midlands	91,572	45,786	63
Leeds/Bradford	73,359	36,679	50

129. This analysis suggests the rail potential is very low, in no case equating to a 550 seat capacity single unit train per day. In contrast the planes used on these routes are small, typically less than 100 seats, and are a much better match for the needs of these markets than high capacity high speed trains.

Possible Service Pattern for Heathrow and HS1

130. The consultation documentation does not give any information on the proposed pattern of services to Heathrow or HS1. It appears likely that no serious work has been done in connection with this – an extraordinary position in relation to a proposed investment of £3.4- £4.8 bn between them. The Economic Case for HS2 does include a:

“service specifications for the Y network”¹⁹, but this does not show any trains to Heathrow or to HS1; there is a footnote which states “Further work is being done to determine which might...run on to mainland Europe”.

¹⁹ <http://highspeedrail.dft.gov.uk/sites/highspeedrail.dft.gov.uk/files/hs2-economic-case.pdf>

Heathrow

131. A frequent, regular service would be essential in order to achieve the scale of modal shift discussed above. The **minimum** pattern is an hourly service from Birmingham, joining at Birmingham Interchange with trains from Manchester and Leeds on alternate hours, giving a two hourly frequency for each branch of the “Y”. This pattern would give a total of 17,600 seats each way over a sixteen hour day, resulting in an unsustainably low average load factor of c13% seats occupied. It is clear that an operation of this nature would not cover the direct operating costs of the trains themselves, and would not therefore contribute towards the cost of maintaining the infrastructure. There is no possibility of any return on capital for either the rolling stock used for Heathrow services or the investment in the spur itself.

HS1

132. A frequent, regular service would again be essential in order to achieve the scale of modal shift discussed above. However the analysis set out above indicates that, at the most, it might be possible to operate two trains daily from Manchester to Paris, calling at Birmingham Interchange, Old Oak Common and Lille (to maximise connections to the wider European high speed network). Given the potential passenger numbers, separate services from Birmingham Curzon Street would not be justified; the West Midlands would be served through the Birmingham Interchange railhead.

133. This pattern of service would be unattractive to high yield business travel, given its low frequency. Even for leisure traffic, prices would effectively be set by low cost airlines which as discussed above offer low prices and require no subsidy.

134. It is therefore clear that an operation of this nature would not cover the direct operating costs of the trains themselves, and would not therefore contribute towards the cost of maintaining the infrastructure. There is no possibility of any return on capital for either the rolling stock used for through HS1 services or the investment in the spur itself.

Reliability Impacts Heathrow and HS1

135. The proposed utilisation of HS2 for the full “Y” scheme is 18 trains an hour, significantly in excess of that for any other high speed route in the world, and only achievable with assumptions on improved signalling and braking technology. There is no resilience in this level of route utilisation, and reliability is therefore at best problematic.

Heathrow

136. The pattern of operation proposed by DfT, with Heathrow trains joining and splitting on-route, adds significant complexity and risk to the planned operation. Without a detailed timetabling exercise, which it is clear has not yet been carried out, the ability even to plan the proposed Heathrow services, with trains splitting and joining at Birmingham Interchange, is unproven and indeed may well be impracticable.
137. In any event, it is certain that this pattern of operation will inevitably lead to serious reliability issues.

HS1

138. In addition to the unprecedented high levels of utilisation of HS2 itself, there are significant issues on other sections of the overall route to Paris.
- The single line tunnel between Old Oak Common and the North London Line represents a clear risk to performance – in the event of late running of a through train in either direction, there are potential consequential delays for trains in the other direction, which would either have to wait at Old Oak Common or, even more disruptively, be held on the North London Line.
 - The North London Line itself is intensively used both for London Overground services, which are planned to increase to eight trains an hour in each direction, and for freight. There is a real risk of the through trains impacting on other services on the North London Line and vice-versa. We understand TfL to have similar concerns.
 - Whilst HS1 is nothing like as busy as the plans for HS2, it does carry both Eurostar services and domestic services with varied stopping patterns, and the route has limited spare capacity in peak periods. There may be significant issues in linking “train paths” across HS2, the North London Line and HS1.
 - There are similar issues through the Channel Tunnel, where Eurostar has significantly faster timings than Eurotunnel’s own shuttle trains, which limits capacity, and on TGV-Nord in France, particularly between Lille and Paris, which has a mix of international services (both Eurostar and Thalys) and French domestic services).
139. Without a detailed timetabling exercise, which it is clear has not yet been carried out, the ability even to plan the proposed through HS1 services is unproven and indeed may well be impracticable. It is also unclear whether

through HS1 trains can be operated without reducing the frequency of the London Overground service on the North London Line below the planned eight trains an hour in each direction.

140. In any event, it is certain that this pattern of operation will inevitably lead to serious reliability issues, with a small delay on any part of the route potentially causing the through trains to lose their slot, causing both delays to the through train itself and consequential delays to other services.

Opportunity Cost

141. It is also clear from The Economic Case for HS2 that operating services to Heathrow and HS1 would have an opportunity cost in terms of capacity to central London, as a train path to central London would be lost for every train to Heathrow and HS1.²⁰
142. Given this, it is clear that the Heathrow and HS1 links spur will **reduce** the already poor benefit cost ratio for the overall project, and potentially make it impossible for HS2 to offer the full geographic range of London services.

Conclusions

143. It is beyond any possible doubt there is no economic case for providing links to Heathrow and HS1, a view held by the rail industry as well – the passenger forecasts are far too low. Further, there are no train paths available for these services in any event, as expanded upon in our response to Question 4.
144. Operation of through services would require significant, unjustifiable subsidies and reduce the Benefit Cost Ratio for HS2 as a whole. Furthermore, the link would increase HS2's capital costs, reduce its capacity into Euston, and reduce overall reliability.

Q4): Do you agree with the principles and specification used by HS2 Ltd to underpin its proposals for new high speed rail lines and the route selection process HS2 Ltd undertook – refer to appendices 4, 7, 8, 9 & 10

145. There are two fundamental points in relation to the principles and specification. Firstly, the evaluation of journey time benefits and the premise that working time on trains is non productive, is by HS2's own admission incorrect and once this is accepted the whole rationale for high speed is undermined.

²⁰ <http://highspeedrail.dft.gov.uk/sites/highspeedrail.dft.gov.uk/files/hs2-economic-case.pdf>

146. Secondly DfT have failed to properly consider alternatives, and have therefore reached a view on the principles of HS2 before they should have done. This is set out above. However, beyond that a number of technical issues lead to questioning the principles and specification used by HS2.

International Experience on other High Speed Lines

147. The DfT passenger forecasts are reliant upon their assumptions about the number of trains that can be provided, their speed and reliability. However, their entire case rests on assuming 18tph for the full network, which is a figure that has never been achieved anywhere in the world for high speed infrastructure. High speed rail worldwide only has 12 -15 tph maximum. Industry experts place no reliance on being able to achieve 18tph in the foreseeable future.

148. The Tokaido Shinkansen operates at the highest capacity, with up to fourteen trains per hour at peak periods. However, the Japanese high speed network is self contained, and does not connect with or import delays from the “classic” network, which is built to a different track gauge.

149. French high speed lines operate at up to 12 trains per hour at peak times at present. German, and Spanish routes operate at lower levels of capacity, in the case of Spain typically at no more than four or five trains per hour.

150. In a “*Why we need HS2*” supplement (April 2011, page 56), Modern Railways reports that Jacques Robouël of Systra (SNCF Consultancy arm) stated at a recent HS2 conference that

“the present signalling on high speed lines allows a dozen trains an hour in each direction – the European Rail Traffic Management System is probably not going to increase this number.”

151. In his evidence to the Transport Select Committee (“TSC”) Mr P Messalum of SNCF said that 18tph does not operate anywhere and that, even given technological advances, the maximum which could be reached is 15-16tph.

152. Network Rail’s assessment is similar. Its “*Strategic Business Case for New Lines*”²¹ states:

“In options that have through running to the classic line network a maximum capability of 14 tph in each direction is assumed. This reduced

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http://www.networkrail.co.uk/documents/About%20us/New%20Lines%20Programme/5883_Strategic%20Business%20Case.pdf page 17 para 3.20

capability is to reflect the significant additional performance risk and the difficulty of integrating the respective route timetables.”

153. Greengauge21 held three workshops in May and June 2010, which included HS2 representatives. A key conclusion was that 18 trains per hour was not realistic. The HSR options identified for the longer term to address this issue were (a) to plan for four tracks over the trunk route between London and Birmingham, (b) to plan for lower service frequencies, or (c) to plan a second north-south high speed line. It is concerning that Greengauge 21 are on record as supporting a second High Speed line to overcome the inability to provide 18tph.
154. It is therefore clear that the claimed 18 trains per hour for HS2 is not achievable.
155. No HSR operates at the speed proposed by HS2, even when distances are very large as in China (Beijing- Shanghai 1463km) and indeed China has just reduced the speed of its high speed rail to reduce energy costs. The distances between cities in the UK are substantially shorter than other countries and thus the journey time savings in the UK would not be of the same quantum and the UK already has a modern high speed railway in the WCML. There is no justification for speed being a driver for decisions on increasing capacity

Planned Utilisation

156. The business case for HS2 is based on a very high level of utilisation of the route, at 18 trains per hour in peak periods and 14 trains per hour off-peak on the Birmingham – London section. The proposed service pattern is set out in the *“Economic case for HS2”*²². This is shown in Figure 4.

²² <http://highspeedrail.dft.gov.uk/sites/highspeedrail.dft.gov.uk/files/hs2-economic-case.pdf>

FIGURE 4 PROPOSED SERVICE PATTERN FOR HS1

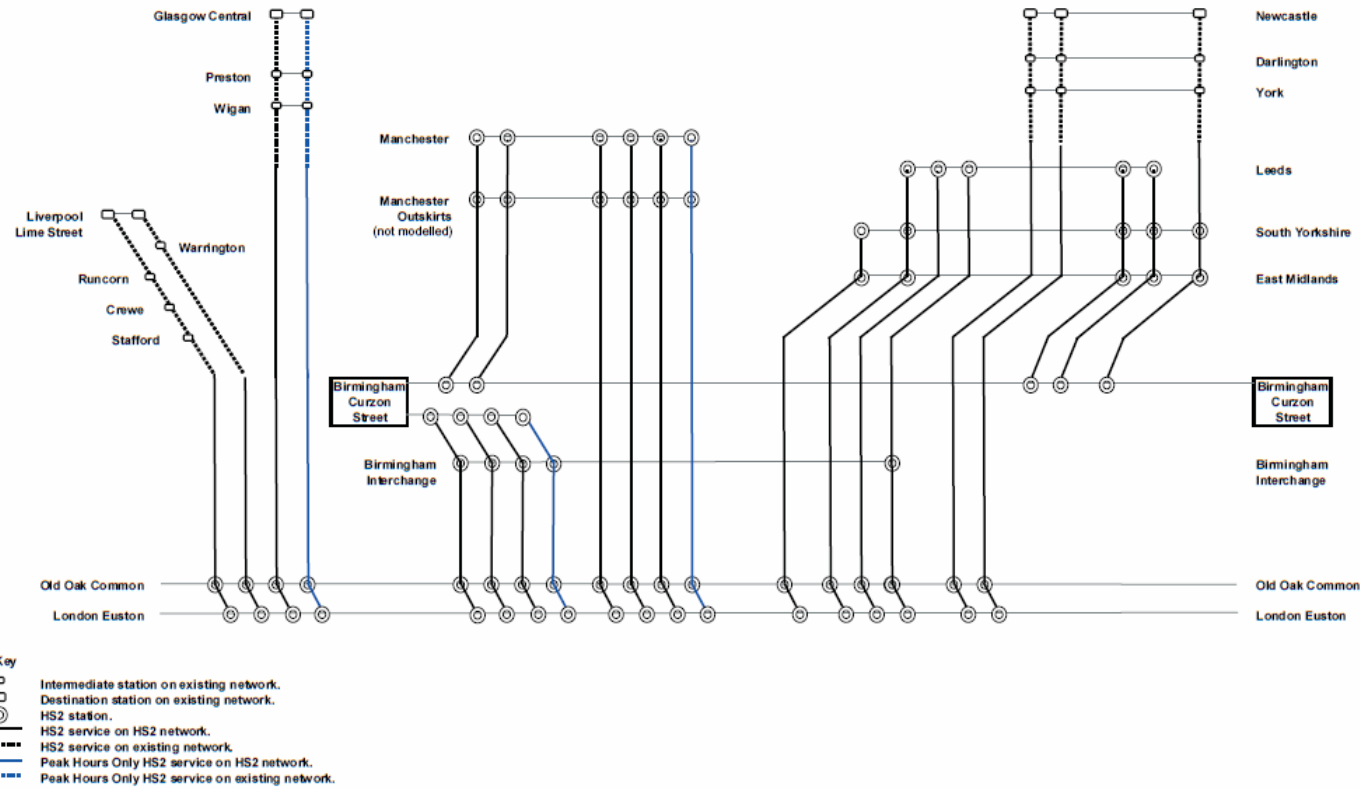


Figure A2 – Service specification assumptions for the Y network

N.B. Further work is being done to determine which of the above services might serve Heathrow and which might serve Heathrow, and which might run on to mainland Europe.

157. Of the eighteen trains per hour in peak periods, six operate to and from destinations on the existing network²³, with inevitably a serious risk of importing any delays incurred on the existing network on to HS2. There are no intermediate stations between Old Oak Common and Birmingham Interchange, so capacity can be optimised on this section of the route.
158. North of Birmingham there are between six and nine trains on the Manchester branch, depending on whether Liverpool and Glasgow services leave the route at Lichfield or at a junction south of Manchester; no information is available on this at present. The Leeds branch has nine trains per hour, of which five are shown to stop at the East Midlands and South Yorkshire stations. This operating pattern represents a major constraint on timetable planning, and may in practice be difficult to achieve, given the need to ensure that southbound trains join the core section south of Birmingham at precise intervals.
159. While HS2 would provide massive overcapacity to Birmingham and, when Phase 2 is complete, to Manchester and Leeds, it is clear from DfT's forecasts for HS2 that capacity will be at a premium on routes where services are extended beyond HS2 to the existing network, with the capacity projected for the Preston – Glasgow and York – Newcastle corridors wholly inadequate to meet their projected demand – as an example, HS2 services to Newcastle will have less capacity than that to be delivered by the IEP trains to be introduced on the ECML.
160. The specification does not include any trains to Heathrow or mainland Europe via the HS1 connection. The document states:
- “Further work is being done to determine which of the above services might serve Heathrow....and which might run to mainland Europe.”*
161. No information is available on the proposed frequency of Heathrow and HS1 services, other than it is stated that Heathrow trains may join and split on-route, presumably at Birmingham Interchange. Again, this operating pattern represents a major constraint on timetable planning, and may in practice not be possible. Any services to Heathrow or HS1 will have opportunity and economic costs, in that it will reduce the number of services that can be operated on the route to Euston.

²³ Assuming that dedicated high speed infrastructure is provided throughout to Manchester and Leeds

HS2 Timetable Constraints

162. As with any high speed line, there are timetable planning constraints caused by the specific characteristics of HS2:

- The approaches to Euston, with conflicting moves in and out of the terminal platforms. This is mitigated, but not eliminated, by grade separation.
- The approach to Old Oak Common station. All trains will stop there, and there are parallel platforms in each direction, but with trains running at the minimum technical headway, deceleration of the first train causes progressively greater delay to subsequent trains – equivalent to the effect of delays propagating on a congested motorway.
- The approaches to other intermediate stations (Birmingham Interchange, East Midlands and South Yorkshire). Stopping trains can be “looped”, and overtaken by non-stop trains, but this consumes capacity on the route, as the train which stops takes up two paths, one in advance and one behind the fast train.
- Integration of service from Heathrow with trains from Euston.
- Integration of services from HS1 at Old Oak Common, and trains from the existing network south of Leeds, south of Manchester and for Phase 1 at Lichfield.

163. It is clear that no detailed timetabling exercise has been carried out to demonstrate that capacity for the claimed service pattern is available, even on a theoretical basis. It is incomprehensible that the Government is proposing to invest £30 billion in HS2 without having carried out a comprehensive timetabling exercise to validate its capacity assumptions.

HS2 Reliability

164. There are a number of factors which will impact on HS2’s reliability

- The requirement for absolute precision in all aspects of operation. Operation at the claimed level of eighteen trains per hour requires trains to operate at an average interval of 200 seconds, little more than the absolute technical minimum.
- Presentation of trains from the existing network. Southbound, six out of the proposed eighteen trains per hour will have started their journeys on the existing network, in most cases having travelled significant distances over busy two track main lines, with a mix of fast and semi-fast passenger trains and significant freight flows. These routes present greater operating challenges than the south end of the West Coast Main Line,

on which one pair of tracks is effectively only used by InterCity trains, all operating at the same speed. It is therefore not realistic to expect that these trains will always be precisely on time – but if they miss their “path”, there will inevitably be significant consequential delays, as there is no resilience or spare capacity with eighteen trains per hour operation.

- Presentation of through services from mainland Europe. These trains will inevitably be subject to risk of delay, having travelled on TGV Nord, through the Channel Tunnel, HS1, the busy North London Line and the single track tunnel between Camden and Old Oak Common – again, if they miss their “path” from Old Oak Common, there is a real risk of consequential delays to other HS2 services
- The pattern of operation proposed for Heathrow trains, with joining and splitting on-route, adds significant complexity and risk to the planned operation. Joining trains will require slower approach speeds approaching Birmingham Interchange, further reducing route capacity. Without a detailed timetabling exercise, which it is clear has not yet been carried out, the ability even to plan the proposed Heathrow services is unproven and indeed may well be impracticable.

165. As with timetable planning, it is clear that no work has been done to simulate the reliability of the planned use of HS2. Again, it is incomprehensible that a detailed simulation exercise has not been carried out to validate the claimed reliability.

Disruption Caused by HS2 Construction

166. Ministers have throughout argued that the construction of HS2 will cause minimal disruption to existing train services, and also claimed that any upgrade to the existing route will cause major disruption over a long period, citing the impact caused by the West Coast Main Line (WCML) upgrade before its completion in 2008.

167. It is true that, for most of the length of the route, construction of HS2 will have minimal impact on the existing network. However, there will be massive impact over 7/8 years at Euston, which is of course the key station on the route; there will also be a significant impact on the Great Western Main Line and Crossrail as a result of construction of the proposed Old Oak Common station, with lesser impacts elsewhere.

Euston Reconstruction

168. There will be major disruption at Euston over a 7/8 year period as is obliquely acknowledged in the consultation documents:

“...the major redevelopment project necessary at Euston station, lasting between seven and eight years...”²⁴

169. It is proposed to rebuild the tracks and the station completely. All the existing platforms will be realigned and rebuilt, with the level of the approach tracks dropped by approximately 1.5 metres north of Hampstead Road, increasing to 3 metres down the length of the station.²⁵ Construction of the HS2 approach tracks to Euston is also certain to cause disruption to the route into the terminal during this period.

170. In addition to the direct impact on train services, passenger circulation will be seriously affected during the construction programme: Euston will become a building site for seven years.

171. Despite the scale of the planned work, Minister’s statements on this have been at best naïve and at worst seriously misleading. Theresa Villiers stated in the Westminster Hall debate on 31st March that:

“... the works required at Euston for RP2 would be considerably more disruptive than those required there for HS2, because they would have to be carried out within Euston’s current footprint, making it much more difficult to keep current services going”

172. Given the scale of reconstruction set out in HS2’s own documentation, including lowering the tracks both on the approaches to Euston and in the station itself, it is inconceivable that the work for HS2 would cause less disruption than the addition of three platforms on the west side of the station proposed by DfT in its RP2 alternative, which our analysis shows is not required in any case.

Euston Services

173. It is likely that train services into Euston will have to be reduced for considerable periods during this work, both as a result of reductions in the number of platforms available during construction and a reduced number of approach tracks, reducing the capacity of the route. This is likely to affect both Inter-City and commuter services. The High Speed 2 Route Engineering Report states that:

²⁴ High Speed Rail: Investing in Britain’s Future February 2011. page 54, para. 2.68

²⁵ High Speed 2 Route Engineering report Para 3.5 <http://highspeedrail.dft.gov.uk/sites/highspeedrail.dft.gov.uk/files/hs2-route-engineering.pdf>

“During construction, planning would ensure that there is minimum impact on existing classic services.”²⁶

But there is no indication of how the work would be phased and for how much of the eight year construction programme services will have to be reduced (for example, the Euston – Watford London Overground service). In addition, work of this scale will certainly require a number of complete closures, typically over holiday periods such as Easter and Christmas.

174. DfT states in the consultation document for the next West Coast franchise:

“...it is likely that major construction work will be needed at Euston station to enable the new high speed rail lines to be incorporated into the revamped station building. The phasing of any such works will only be decided after the consultation, but the new franchisee would need to be prepared for the possibility of some disruption to both services and the station concourse interchange during the next franchise”²⁷

175. However, HS2 Ltd has recently stated in its submission to the Transport Select Committee that: “We believe that the redevelopment of Euston station could be accomplished while maintaining at least the current off peak service level, and there may be some minor alterations to the timetable. There would be some instances of disruption to services where, for example, the station would be closed for a few days over the holidays”. Since the off peak services are some 40% less than the peak services, this implies major additional crowding and no additional capacity, on the already congested commuter services for some 7-8 years.

176. With 30 million passengers using Euston in 2010, the reality is that the disruption will be massive, potentially much greater on large numbers of commuters than was the case with the WCML upgrade. This is a project which was described by a participant at a High Speed rail conference in February as “open heart surgery on a conscious patient”²⁸

Great Western Main Line

177. The major and complex work required to build Old Oak Common station may require reductions to commuter and Inter-City services to and from Paddington for a significant period, in addition to the impact on services during construction of the committed Crossrail project, including the construction of the Crossrail train maintenance depot at Old Oak Common.

²⁶ High Speed 2 Route Engineering report Para 3.1

²⁷ InterCity West Coast Consultation Document January 2011. Page 39

²⁸ Modern Railways April 2011 page 55

178. The work at Old Oak Common involves major construction on an intensively used main line route, and there will inevitably be serious disruption to train services during the construction period. The scale of this disruption is totally unclear because of the lack of detail provided by DfT; for example, it is not clear whether access to the Crossrail depot can be maintained throughout the construction period.

Impacts of HS2 on the broader rail network

179. The HS2 case is based on no investment beyond that already committed by 2015 on the WCML, MML or ECML, until the completion of HS2, even though the DfT is predicting major growth on these routes in the intervening years. This will lead to major overcrowding issues and is an unsustainable position. Overcrowding currently exists on the commuter route between Northampton/Milton Keynes and London and will not be addressed until 2026 at the earliest when Phase 1 of HS2 is proposed to open.

- a) HS2 results in the WCML only having an average load factor of 31%. £9bn has recently been invested in this route to make it the most modern in the UK. This is an extraordinarily poor use of existing assets, and wholly contrary to the message from the McNulty review.
- b) There will be capacity and/or frequency reduction to some cities, for example Coventry, Wolverhampton, Stoke-on-Trent, Leicester, Chesterfield, Peterborough and Doncaster. These reductions are included in the business case, because there is an assumed saving of around £5bn (NPV) in operating costs. Any promises to maintain existing service levels to these cities would have serious impact on the business case.
- c) As Heathrow Express (HEX) trains to stop at Old Oak Common, all GWML services will also have to stop otherwise capacity on the route will be reduced. This would add approximately 5mins to all journey times to/from the West and Wales.

Impact on Freight

180. The current Network Rail freight strategy does envisage freight tonnage growing in the next 30 years with the highest growth in containerised traffic from the ports of Felixstowe, Southampton and Thames Gateway.

181. Freight movements on WCML are predominantly intermodal. This sector has shown strong growth, which we expect to continue, with rail gaining market share from road, so it is vitally important to ensure that freight growth is not constrained. Part of this growth will be absorbed by operation of longer trains, delivering improved productivity for the operators, which is of course vital for them in competition with road haulage - this is a highly

competitive business, with very thin margins. But there will certainly be a need for additional freight trains, at least on parts of the route.

182. Fortunately, almost all the route between London and Crewe is four track, with the two "fast" lines essentially only used by fast passenger trains in the daytime. So any increase in InterCity services has little direct impact on freight capacity except at a limited number of pinchpoints, for example between Rugby and Nuneaton, where there is only one northbound track for part of the distance, and at junctions at Colwich (where the route to Manchester via Stoke splits from the main line) and Stafford. The £2.06 billion investment proposed in the optimised alternative would directly ease these pinchpoints, so freight capacity would not be reduced as a result of an incremental increase in InterCity frequencies.
183. Current freight capacity on the route south end of the route, between London and Nuneaton, is 2-3 trains per hour in the day, except during the commuter peak (although even then, some freight trains do run). Capacity is much higher at night, probably up to 8-10 trains per hour. If all the available capacity is taken, the route could theoretically take up to 120 freight trains each way daily, although in practice this would not be achievable because of the need both for flexibility and to absorb delays. The practical limit is, say, 80 trains. At present the route takes c36 trains south of Nuneaton, so it is busy, but by no means full. However, Network Rail is currently doing work to upgrade the Felixstowe - Nuneaton cross country route, which will provide a more direct route from Felixstowe, Ipswich and Harwich. This will potentially take up to 20 trains each way off the West Coast Main Line south of Nuneaton, freeing up capacity south of there for any conceivable future growth.
184. North of Nuneaton, there are currently c40 freight trains a day each way. Passenger use of the "slow" lines on this section of the route is relatively limited, with only one train an hour throughout the day. Once the pinchpoints in the Stafford area have been eliminated, as discussed above, the capacity of the route for freight will be of the order of 4 – 5 trains an hour throughout the day, again giving ample capacity for future growth.
185. In the longer term, there are likely to be significant constraints on freight growth on the two track section of the route between Preston and Glasgow, used both by freight and InterCity passenger trains, where capacity is seriously constrained by the wide differentials in train speeds. Further significant investment may be required to upgrade the speed and capacity of alternative routes, such as Preston – Settle – Carlisle, but this will of course be necessary for HS2 also, since high speed trains to Glasgow would use the current route north of Manchester.

Conclusions

186. The evaluation of journey time benefits and the premise that working time on trains is non productive, is by HS2's own admission incorrect and once this is accepted the whole rationale for high speed is undermined
187. Operation of the planned 18 trains per hour is almost certainly impractical. Based on experience in other countries, the maximum realistic capacity is 12–15 trains per hour.
188. A reduction in planned use to 12 – 15 trains per hour, together with the use of some paths for Heathrow and HS1 trains, will significantly reduce the available range and frequency of HS2 services to London, with a major adverse impact on the business case for the project.
189. There are serious doubts as to whether the reliability claims made by HS2 and included in the business case as benefits can be delivered
190. HS2 construction work will produce significant disruption and reductions in services for 7/8 years causing major capacity problems into and out of Euston. This disruption will be magnitudes greater than that required for limited the works for the incremental investment identified in the optimised alternative.
191. The lack of investment in the classic network until HS2 is completed will cause major capacity problem and a number of city will have a significantly worse service than today when HS2 is implemented

Q5: Do you agree that the Government's proposed route, including the approach to mitigating impacts, is the best option for a new high speed rail line between London and the West Midlands – refer to appendices 6 & 13

192. In 51m's view there are so many fundamental problems with the consideration of the environmental impacts of HS2, and therefore the process of route selection, that it is not possible to make properly informed comment on whether the proposed route is the best option, or whether the approach to mitigation is correct. There are three examples of the fundamental problems with the consideration of impacts.

193. Firstly, the proposal has not properly considered the statutory duty to ensure the preservation and conservation of Areas of Outstanding Natural Beauty. The Secretary of State has a duty:

“In respect of exercising or performing any functions in relation to or so as to affect land in an Area of Outstanding Natural Beauty, to have regard to the purpose of conserving and enhancing the natural beauty of the Area of Outstanding Natural Beauty”

The level of detail in the consultation documents is so limited as not to enable a decision to be made which is consistent with that duty, because the impacts on the AONB are not properly assessed.

194. Secondly, there are serious concerns, including from those who have attended the HS2 “roadshows”, that the noise impact of the proposed line has been seriously underestimated. This means that the route selection exercise is flawed.

195. Thirdly, no proper equalities impact assessment has been carried out, and therefore it is impossible to balance the undoubted impacts as against either the alleged overall benefits, or the pros and cons of different routes.

196. Fourthly, the entire route selection exercise has been premised on HS2 going to Heathrow. For the reasons given under the response to question 3 above, there is simply no case, whether in economic or transport terms, for going to Heathrow. Therefore the entire route selection exercise is fundamentally flawed and if the Government insists on proceeding with HS2 at all, the route selection process must be undertaken entirely afresh.

197. Fifthly, no details of mitigation measures have been provided and only a sum of money is identified.

198. Further comments relevant to the question of mitigation are set out in the response to question 6 below.

Q6: Do you wish to comment on the Appraisal of Sustainability of the Government’s proposed route between London and the West Midlands that has been published to inform this consultation? – refer to appendices 6, 13 & 16

AOS

199. HS2 have provided little detail on the environmental costs, benefits and mitigation (apart from saying there will be some and allocating funding) for London to Birmingham (Phase 1). No details have been provided for the Y (Phase 2) and the route has not even been identified, although HS2 have indicated that this will be divulged at the end of this year after

the consultation has been completed. This is the only opportunity for the benefits and drawbacks to be understood and considered, before the principle is fixed. The lack of information makes any valid consultation or assessment impossible and completely undermines the Appraisal of Sustainability.

200. The Appraisal of Sustainability (AoS) presented as part of the Consultation documentation demonstrates that HS2 will not be a sustainable project. The Government has set out aspirations of a sustainable transport sector in its White Paper: Creating Growth, Cutting Carbon as well as within the DfT 5 year Business Plan. The Government has long since pledged that sustainable growth is at the heart of all new development projects. However, the AoS provides a negative assessment of all environmental and social factors related to HS2.
201. At the core of the AoS is an unsatisfactory attempt to provide measures to reduce the negative impacts. Although HS2 Ltd acknowledges that the scheme will have many negative impacts, there is no formal commitment to mitigate these. The mitigation measures are far too generic to have any practical weight at future decision making stages, which undermines the point of a sustainability appraisal. Further detailed mitigation methods or policies should be presented as part of the AOS to demonstrate how the project could be supportive of the sustainability objectives.
202. The AoS has not been properly carried out or consulted upon with regard to the other alternatives, such as improving the capacity of existing rail services. This is fundamental to any proper sustainability assessment. It is therefore not possible for the public to have an understanding of the sustainability performance of the alternative options. HS2 Ltd has assessed the proposed route as having considerable negative impacts. This makes it even more important to provide an understanding of why the proposed route is being promoted ahead of the other options.
203. The AoS has assessed only regional and national impacts and no local impacts have been considered in any detail. When local impacts are added to the vast range of negative regional and national impacts, the AoS would further suggest the HS2 proposal is unsustainable.
204. Without prejudice to 51m's view that the proposal should not, on the basis of the information in the consultation document, be taken further, it is clear that HS2 should not proceed to design stages until it can be proven that there is a commitment to specific and detailed mitigation policy requirements, which are clear and transparent in addressing the negative impacts. Further information, consultation and consideration are needed

205. Given that the route goes through four rural counties, as well as densely populated urban areas, it would not be unreasonable to assume that the number of adverse impacts on environmental assets would be very substantial. It is also important to remember the impact on people's lives, both in terms of noise and disruption, but also the 100s of dwellings to be demolished: and more information and consultation is needed

Carbon

206. Government statements have characterized HS2 as "green". In a letter dated 9 February to a colleague, Phillip Hammond reiterates this claim, and also says that the first phase of HS2 to Birmingham itself will also be broadly carbon neutral. This is plainly incorrect and positively misleading.

207. A review of the appraisal of the HS2 Greenhouse Gas Report shows that the assumptions of both HS2 and Phillip Hammond are inaccurate and misleading. It also demonstrates that based on the information provided, HS2 will not even be broadly carbon neutral, but is likely to increase the UK's carbon emissions. Thus support for HS2 appears to be in direct conflict with the Secretary of State's recent announcement on the changes to the project appraisal methodology which will give significantly greater emphasis and priority to projects which reduce carbon emissions.

208. One area of concern is the lack of clarity in the consultation material over what is being assessed and what is meant by the 'proposed route' in the context of the Greenhouse Gas Report (the 'HS2 Ltd Report'), paragraph 1.1.2 of the report states:

"A full appraisal of the scheme between London and Manchester and Leeds would be undertaken during the course of 2011 to take account of the more detailed scheme proposals to Manchester and Leeds, as well as any policy revisions with respect to energy, carbon and transport that may have emerged by this stage. For this report, we have considered what the wider network might be in the longer term, up to and beyond Manchester and Leeds, in order to gain an understanding of what the full long term effects might be".

209. This could imply that the proposed route is actually different from the meaning used elsewhere in the Consultation documents, and that the Green House Gas Report assesses the 'Y' network and beyond (although no reference is made to the 'Y' network) or that benefits from the Y have been considered in the assessment of Phase 1 London – West Midlands.

210. However, if it is assumed that the Greenhouse Gas report does only relate to London – West Midlands then Phase 1 cannot possibly be even close to carbon neutral as the high

construction and operational carbon impacts will not be offset by a reduction of domestic aviation. There are no domestic flights between London and Birmingham and the time savings from further north (Manchester and Scotland) are too marginal to create modal shift from air.

211. The report fails to give any consideration to what is likely to happen to freed up domestic flight slots as people flying from Scotland switch to HS2. The basis for the carbon neutral claims is the assumption that any released domestic slots lost to HS2 would not then be taken up by medium or long haul flights, which emit more carbon. The evidence from the aviation industry suggests very strongly that freed up slots from domestic services would be taken up by more lucrative long haul flights. This was recently demonstrated by BMI when it ceased its London – Glasgow services and used the slots for medium haul services.
212. HS2 Ltd has provided no modelling or flight information making it difficult to assess their appraisal. However, previous reports (ref) have set out more comprehensive assessments and concluded that the only aviation competition for high speed rail is the London to Scotland links, because there are currently no Birmingham or Leeds flights to London and in 2008 rail had 80% of the rail/air market from Manchester to London. The domestic air market has declined in recent years as airlines have moved away from less profitable domestic flights. HS2 only predicts a 30min saving, on the current minimum 4hr rail journey time to Scotland²⁹, when the Y is completed. This is not sufficient to achieve any appreciable modal shift from air. Thus any real benefits in the Greenhouse gas report can only be assumed to come from if HSR links are made all the way to Scotland. However, even with a high speed rail link to Scotland there would still be a 38% (ref) aviation share of the London to Edinburgh route.
213. HS2 Ltd appears to be relying on the untried and untested EU Emissions Trading Scheme (ETS) to control the switch from domestic to international slots. The EUETS only includes aviation emissions from 2012, and therefore its impacts are not yet known. Very serious doubts have been raised over its efficacy, and it is inconceivable that capacity constrained airports such as Heathrow will reduce the number of available slots Taking the above two point together it is implausible to consider that any freed up domestic slots will not be reused for medium or long haul flights and thus the Y can be nothing but carbon negative.
214. A further issue in relation to the carbon impact is that the HS2 trains will travel at speeds significantly greater than European high speed trains. HS2 Ltd's high speed (360kmh) trains

²⁹ It is noticeable that the Consultation Document at fig 2 refers to current Edinburgh to London journey time of 4hr 30 mins. However, ECML have now introduced a 4 hour service 19 times per week. Therefore the correct comparison time should be 4 hours and not 4hrs 30 minutes.

have a 90% higher electricity demand than regular (200kmh) trains. In recent months, Chinese high speed rail operators have reduced their high speed trains to 300km/hr to reduce the cost of energy. The UK's energy market is neither stable nor self reliant. With reliance on overseas supplies and the decommissioning of several domestic power stations without any permitted replacements, there is no agreed strategy in place to provide a more stable energy market in the UK to date. Consequently HS2's enormous consumption, upto 18 high speed trains per hour on the section between London and Birmingham for the complete Y, is highly vulnerable (both in terms of the level of emissions and price).

215. A summary of operational carbon in the Greenhouse Gas report is given table 4 and using HS2's analysis one can only conclude that Phase 1 is hugely carbon negative. As described above, Phase 1 will not attract passengers from air and thus the most optimistic conclusion has to be that HS2 Phase 1 will have no impact on domestic aviation as eluded to in paragraph 6.1.3

“for the purposes of completing this appraisal, a zero net change in air travel related to carbon emissions was used as a mid point”.

Using HS2's own figures this results in an increase in carbon emissions of some 15.7MtCO₂e.

216. It is difficult to assess whether the “embedded” carbon (construction) impacts are correct. A comparison could be made with Crossrail. This suggests that the HS2 assessment is a significant under-estimate of the true impact. Crossrail embedded carbon emissions have been assessed at 1.7MtCO₂e and the major generation of these emissions is the 22km of tunnelling. In contrast, HS2 embedded carbon emissions are assessed to be only 1.2MtCO₂e, although the route length is some 180km and like Crossrail it has some 20km of tunnelling. Even this basic comparison suggests a significant under estimate of embedded carbon.
217. In addition HS2 Ltd have accepted that their assessment of construction spoil of 700,00m tonnes is a major underestimate. A very high level assessment by 51m indicates that the actual spoil quantity is likely to be at least 10 times more than the figure stated by HS2 Ltd. This will result in a significant increase in embedded carbon and further supports 51m view that the embedded carbon estimate are underestimated by some magnitude.
218. Considering the operational and embedded carbon impacts as described above results in an increase in carbon emissions of a minimum of 17MtCO₂e and thus HS2 is hugely carbon negative and would lead to an increase in UK GHG emissions. This is a serious problem which needs to be properly examined in the context of international and domestic

obligations to reduce the UK's emissions. Plainly to proceed with the project on the assumption that it is "green" would be wrong.

219. Due to the lack of data shown, it is not possible to critically appraise the cost of carbon. Nevertheless, HS2 has costed it at somewhere between +£1.37billion (i.e. the value of carbon savings) and -£4.6billion (the value of additional carbon used). However, they acknowledge this could be worse if freed up domestic slots become international flights. Again, no figures have been provided or a proper assessment been made. Using the same conclusion as for operational carbon above, table 8 of the Green House gas emissions report, calculate the cost to be -£2billion. If the aspirations of the aviation industry are realised, and freed domestic slots are switched to long haul flights, then the fiscal cost could rise further. We are concerned that the business case does not include a figure for the cost of carbon, nor is there any supplementary business/economic case which does so. This results in no proper consideration of the carbon impacts of HS2 having been undertaken.
220. The report fails to provide an adequate timeline of emissions. The construction and operation of Phase 1 will be highly carbon negative. Only when the 'Y' network is constructed and operated will there be any limited competition with air travel, and even then for the reasons set out above carbon benefits are highly unlikely as any relinquished domestic slots will be used for medium or long haul flights. HS2 would have to provide a direct link to Scotland before any noticeable impact on aviation is made. Therefore HS2 will rack up considerable carbon deficits prior to any noticeable impacts on domestic aviation. It is misleading to portray the carbon impacts of a fully operational 'Y' network with links to Scotland without considering the 30+ years of carbon deficit.
221. HS2 acknowledge that it will only have a minimal impact on road use with only 7% of its passenger having transferred from car, resulting in about a 1MtCO₂ reduction over 60 years, this is in contrast to the UK road transport emissions of some 113MtCO₂ in 2009 alone. It is concerning that the largest single public transport intervention in the foreseeable future will have no noticeable impact on the UK's transport emissions. Transport provides a quarter of the UK's emissions and should be a prime target for helping to meet the overall 2050 reduction target of 80%.
222. HS2 relies on satisfying a latent demand in travel, (people who are only making the journey because of HS2) with a 100% increase over and above the demand growth for the classic network. The report makes no acknowledgement of the number of additional passengers generated by HS2, and the additional emissions caused by these new journeys. It is likely that the increased demand of energy intensive rail (HS2) will outweigh any potential reduction in domestic aviation. HS2 proposes to have city centre stations and then upto 3

parkway stations for the full Y,. This is in direct contrast to the classic network which serves numerous station/cities directly in the London to Manchester/Leeds corridors. The result of the small number of HS2 stations will be that a significant number of its passengers will have to drive to catch HS2, eg Birmingham Interchange has 7000 parking spaces. The impact of these additional car journeys does not appear to have been taken into account in the evaluation, either in relation to CO2 or in relation to air quality.

Noise

223. Quantitative assessment of noise and vibration impacts is limited in the HS2 'strategic assessment' to the calculation of train operational noise levels and presentation of information on the numbers of dwellings which may experience an exceedance of three threshold criteria for 'High Noise Levels', 'Noise Insulation' and 'Noticeable Noise Increase' during an 18-hour daytime period between 06:00 and 24:00 hrs.
224. Notable omissions in the HS2 train noise study and hence in the identification of noise mitigation requirements include the absence of any quantitative assessment of: night-time train noise impacts at dwellings (between the conventional 8-hour night-time period of 23:00 to 07:00 hrs when the HS2 service pattern indicates that 66 to 90 train movements will run between 23 and 24:00 hrs and between 05 and 07:00 hrs); and train airborne noise impacts at non-residential receptors and resources such as community, education, healthcare and outdoor recreational facilities. Other potential sources of adverse noise and vibration impact at both residential and non-residential receptors include: airborne noise from vent shafts, train and infrastructure depots, line-side equipment and other fixed plant; ground-borne noise and vibration from trains running in tunnels; surface and sub-surface construction noise and vibration.
225. The project definition of a threshold value of 73 dB $L_{Aeq,18hr}$ for 'High Noise Level' forms part of the HS2 assessment of train pass-by noise and the identification of mitigation requirements. Its application is unprecedented but justified by HS2 on the basis that this value is defined in Defra Noise Action Plans for the identification of First Priority Locations and the immediate prioritisation of the management of noise from existing railways. However, its use outside the context of Noise Action Plans is expressly precluded by Defra. It represents a free-field noise level which is effectively 8 dB higher than the daytime qualifying level for the statutory offer of noise insulation in the UK to protect dwellings from high levels of external noise. Its inclusion in the assessment is questionable and open to challenge.

226. The Noticeable Noise Increase category covers a wide range effects from a relatively mild 3dBA increase to a very significant potential 19dBA increase and therefore masks the true effects. The cut off for falling into this category at 50 dBA ignores the fact that many properties in more rural locations and even in smaller towns currently experience noise levels below 45 dB LAeq18hr and so could suffer a significant 5-6dB increase in noise and have not have been included in this assessment.
227. Most European railway noise limits do not exceed a daytime level of 65 dB LAeq,T and it is concluded that a more appropriate project definition of 'high' daytime noise level would be 65 dB LAeq,T and that the HS2 'High Noise Level' criterion detracts from the substantive impacts that properties will experience at levels below a daytime noise level of 73 dB LAeq,18hr . The HS2 definition of Noticeable Noise Increase and its universal application to the identification of short term noise impacts, as well as long term impacts, and impacts in areas of low ambient noise is also open to challenge. Instantaneous train pass-by noise levels will exceed average 18-hour daytime noise levels by up to around 15 dB at speeds of up to 360kph on the basis of HS2 information provided outside the AoS. It is considered that these warrant further consideration for the purposes of public consultation and the additional consideration of sleep disturbance.
228. The identification of train noise mitigation requirements on the proposed route alignment requires detailed consideration of the numbers and magnitudes of noise impacts or changes at both residential and non-residential receptors. This in turn requires the application of robust calculation procedures and development of input assumptions, as well as the development of relevant noise appraisal criteria. The contribution of aerodynamic noise to overall train noise levels at higher speeds requires further and more detailed consideration, as does the contribution of mechanical noise from train motors, fans and ancillary equipment at low speeds if the acoustic benefits of barriers and other forms of screening are not to be overestimated because of inadequate assumptions about source heights and other acoustic characteristics. The HS2 assumption that train noise sources can be represented by a single source at a height of 1m above rail for train speeds above 300kph and that 3m or higher barriers can be represented by barriers 1m lower is questionable and will result in the overestimation of barrier acoustic performance at all barrier heights, including 2m high barriers on viaducts, where significant noise is generated at greater heights above the rail.
229. Notwithstanding the above limitations, a high number of daytime impacts at dwellings is presented for the HS2 additional mitigation scenario (4,700 with Phase 1 and n=6,600 with the Y service level). This scenario is based on an anticipated 3 dB reduction in future TSI

noise specifications for train speeds of 300 and 320kph, which may or may not materialise, and the installation of noise barriers or alternative forms of unspecified mitigation which would provide an acoustic benefit equivalent to that of 3m high line-side barriers. For high speed trains running above 300kph the acoustic performance of such barriers has been calculated on the basis of a 2m high barrier in an attempt to account for the deleterious effects of aerodynamic noise on barrier attenuation.

230. The number of predicted adverse impacts for the HS2 additional mitigation scenario represents an approximate 5 fold decrease in the numbers of impacts presented for the base engineered case 'without additional mitigation scenario' (33,600/24,300 for the with/without northern extension). However, the residual magnitudes of noise impact have not been defined with respect to any noise changes above 3 dB, i.e. the difference in ambient noise levels with and without the high speed rail line in operation. The HS2 presentation of noise impacts based on a noise change of 3 dB or more makes no distinction between noise impacts of higher impact above this threshold of noise change. Substantive impacts of 10 dB or more, which could occur at levels below the absolute threshold level for noise insulation, cannot therefore be differentiated in the AoS and the HS2 identification of candidate areas for additional mitigation. It is thus not possible to determine the significance of the numbers of impacts presented in the AoS and hence whether these represent a tolerable level of impact in the context of major infrastructure projects and sustainability.

231. No account has been taken of the impacts of having to re-align existing transport corridors. Works of this nature, which are a direct consequence of the construction of HS2, may significantly affect adjacent properties, particularly during the construction phase, and no account has been taken of these effects in the AoS.

232. Baseline noise levels have not been determined and the assumed levels are subject therefore to considerable uncertainty. Other uncertainties in the assessment and hence in the identification of the requirements for mitigation have been identified. In summary, these include:

- HS2's anticipated reduction of 3 dB in future train noise emissions;
- assumed train speed west of the Chiltern tunnels, where the track design speed is 400kph, rather than the HS2 specified operational speed of 360kph;
- actual track quality where this exceeds the TSI specification for type testing of trains;
- night-time noise impacts;

- line-side barrier performance and source heights for mechanical equipment and aerodynamic noise;
- the magnitudes of noise impact or change;
- the numbers of noise impacts which fall below the HS2 cut off level of 50 dB $L_{Aeq,T}$ for Noticeable Noise Change;
- the location and identification of noise impacts at non-residential receptors.

233. The development of more appropriate and robust procedures for the calculation of noise from high speed trains is required before any noise mitigation can be determined.

Public Sector Equality Duties

234. The AOS includes, as an appendix, an equality impact assessment screening report. It is clear from this report that further work needs to be done before a firm decision to progress with this proposal can be made.

Conclusions

235. For the above reasons it is not possible to understand the real environmental costs and benefits of HS2 or the mitigation proposed as little or no information has been provided.

236. This is the only opportunity for the benefits, drawbacks and mitigation measures/principles to be understood and considered, before the principle is fixed. The lack of information makes any valid consultation or assessment impossible.

237. Given that the AOS has concluded that HS2 is unsustainable, an assessment of alternatives should have been carried out to demonstrate why HS2 is being promoted above other options.

238. The AoS has only assessed regional and national impacts and no local impacts have been considered. When local impacts are added to the vast range of negative regional and national impacts, the AoS would further portray HS2 as being highly unsustainable.

239. Phase 1 of HS2 will be significantly carbon negative with a fiscal cost of some -£2bn and the whole Y is will not even be carbon neutral as freed up domestic slots will be used for medium/long haul flights. This appears to be in direct contravention of the recent announcement by the Secretary of State that priority will be given to projects which deliver carbon benefits

240. The largest single transport project in the foreseeable future will have no impact on the UK's 2050 target of reducing emissions by 80%

241. The Greenhouse Gas report is wholly inadequate and should not be the sole assessment of the carbon impacts of the project and is therefore not a suitable evidence base on which to make a decision on a £30billion 'green' infrastructure project.
242. The assessment of source noise, mitigation and impacts has inadequately described the true impact of this proposal on the affected residents and communities. It is highly likely that their impacts and true monetary costs have been significantly underestimated.

Q7 Do you agree with the options set out to assist those whose properties lose a significant amount of value as a result of any new high speed line?

243. 51m is extremely concerned about the blighting impacts of the HS2 proposals on residents, businesses and local communities. This blight is already apparent along the route, and it is essential that appropriate action is taken urgently to address this problem.³⁰ Even on the DfT's own case if HS2 is proceeded with there will be blight for at least a further 14 years (2026 for phase 1, 2033 for phase 2). However, in reality it is likely that the blight will last much longer than that, given inevitable delays in the project. There is therefore a very realistic prospect that communities will be faced with a huge swathe of blighted properties for 20-30 years. The consequences for businesses, including agriculture, and for individual residents and property owners are serious.
244. The terms of Question 7 are very unclear. It is unclear whether the consultation is only on three discretionary schemes referred to in Annex A, or potentially covers other schemes, and whether it is simply being asked whether there are any other options, or about the terms of those options. Members of 51m are aware that many local residents are highly confused about what they are being consulted on in respect of compensation. Further, this is an aspect of the consultation where the failure to provide any information about the route of the Y wholly undermines the consultation. There will be very large numbers of people (individuals and businesses) and communities who will ultimately find themselves on the route of the Y, but are not being consulted now in a meaningful way (because they do not know whether or not they are affected) on a matter of the greatest interest to them, namely the form of any compensation. This is manifestly unfair.
245. 51m also has a number of concerns about the terms of the national compensation code, and whether these provisions are adequate in relation to HS2. Given the scale of HS2, the number of properties affected and the very long time scale involved, 51m believes that, unless the proposals are rejected at this stage, it will be necessary to re-consider provisions

³⁰ CBRE Report (December 2010)

within the national compensation code. However, this important consideration does not appear to fall within the scope of Question 7, and therefore 51m will reserve the detail of these points, if necessary, for a later stage.

246. 51m notes that Annex A makes clear that there will be further consultation on the preferred approach to compensation. We will make reference to this below, but 51m is concerned that Annex A paragraph 32 appears to suggest that future consultation will be with those “who would be most likely to have an interest in the proposal”. We assume that this will include all the relevant local authorities, and will not merely be with affected individuals. A failure to consult local authorities would be manifestly unfair and inadequate. The effect of compensation proposals on communities reach more widely than the serious effect on current property owners and further consultation must take this into account.
247. The starting point for deciding on what discretionary scheme to adopt, and its terms, must be the principles upon which such scheme is based. In 51m’s view those principles should be;
- a. That any scheme is based on the principle of fairness to all those who are affected;
 - b. That such principles must be applied to both residential and business premises and to owners of agricultural land.
 - c. A fundamental feature of any scheme is that those affected should not have to wait for compensation/purchase for a prolonged period. This is particularly the case given the very extensive period of blight that arises with HS2;
 - d. Any scheme should address the real effects of blight and not be limited by artificial distance (or noise) criteria.
 - e. Any scheme should aim to ensure that so far as possible the property market continues to operate normally in the affected areas. This should cover not merely people who wish to move property, but also those who wish to re-mortgage their property.
 - f. Any scheme should have the support of relevant financial institutions, and they should make commitments that they would honour the principles of such a scheme.
 - g. The effect of wider blight on communities.
248. 51m is not in a position to make detailed or final comments on the three options proposed, given the lack of information provided in Annex A and the large number of questions that arise in relation to the operation of any of the schemes proposed. Therefore the comments that are made below should be viewed as being provisional, until full information is provided.

249. The hardship based property purchase scheme is a continuation of the existing Exceptional Hardship Scheme. 51m does not believe that such a scheme is acceptable other than in the very short term. Firstly, it does not meet the criteria of fairness, because the vast majority of those affected by HS2 would not qualify under such a scheme, and therefore they individually have to bear the financial loss from HS2. Secondly, it does not promote, effectively or at all, the normal operation of the property market, and therefore does not really address the problems flowing from generalised blight. Thirdly, even as a short-term interim measure, the criteria applied are so stringent, and the discretion exercised so strictly, that in practice the scheme is likely to assist only a very small minority of those adversely impacted by HS2. If the Government rejects these representations and does seek to adopt a hardship based scheme alone, then the terms of such scheme must be fundamentally re-written.

250. 51m considers that the second option, the bond based scheme, is in all probability the best of the three options because it has the most potential to meet the relevant criteria. However the level of information provided makes it impossible for 51m to give a concluded view on this or to make any detailed submissions as to the form of such a scheme. The DfT should provide the following further information;

- a. a full analysis of the earlier schemes which are referred to;
- b. the trigger point that would be adopted;
- c. provision for independent valuation;
- d. details of how indexation would be dealt with;
- e. provision for payment of consequential costs and losses;
- f. consideration of how large numbers of vacant properties can be avoided.

251. 51m's present view is that a compensation bond scheme, certainly on its own, would not be a workable or adequate scheme to meet the relevant criteria. We need further information on how it is envisaged such a scheme, and in particular the indexation provisions, would work. Further, for such a scheme to have any prospect of success (in conjunction with another scheme) it would be essential that all relevant financial institutions were fully committed to it.

