

CADRAG R1

**Analysis of the Proposed HS2 Route from London
to Glasgow and Edinburgh, Western Leg,
Golborne Connection, near Culcheth**

Prepared by Frank Allen

**Culcheth and District Rail Action Group
(CADRAG)**

19th November 2013

Contents

	Page
Executive Summary.....	3
1 Introduction	4
2 Impact on the Community	5
2.1 Environmental Impact.....	5
2.2 Economic Impact.....	7
3 WCML Upgrade vs Golborne Connection	10
4 Conclusion	13
Acknowledgements	13
Appendix 1 Response received from HS2 to FOI request for information on the Golborne Connection.....	14
Appendix 2 Extracts from a Review of HS2 Economic Case and Regional Impact Study by Alan Debenham	20
Appendix 3 Results of Assessment of Impact on Culcheth Businesses of Closure of Wilton Lane for Bridge Works.....	34

Disclaimer

The author does not guarantee the accuracy, completeness or usefulness of the information contained within this report. He cannot accept liability for any loss or damages of any kind resulting from reliance on the information or recommendations this document contains.

Analysis of Proposed HS2 Route from London to Glasgow and Edinburgh, Western Leg, Golborne Connection, near Culcheth

Executive Summary

HS2 propose that the main HS2 line from London to Glasgow and Edinburgh should be routed from a junction near Lymm via a new high speed line to Golborne, where it will join the existing West Coast Main Line. This Golborne Connection will run along the edge of the village of Culcheth and other communities. It will be designed to carry 36 trains an hour at 225 mph.

This will have a devastating impact on Culcheth, a village of 8,600 people in 3,500 households.

The environmental damage will include the destruction of the 2.5 km Culcheth Linear Park, a vital local amenity; the impact of noise from the trains on the local residents (there are 947 houses within 500m of the line); and the visual impact of the line and the three major road bridges.

The economic impact will include loss of the Taylor Business Park and the 497 jobs it currently provides, and potentially loss of at least 68 jobs in Culcheth village due to disruption of local traffic during construction affecting local businesses there.

This will remove £10.24m annual income from the local economy, and reduce property values in the village by approximately £50m.

None of these impacts have been considered by HS2 in designing the route.

HS2 argue that the Golborne Connection at £800m will be only slightly more expensive than the alternative of upgrading the West Coast Main Line from Crewe to Golborne at £750m, and deliver a reduction in journey time to Glasgow of 13 minutes, which they value at £1.2bn. We challenge this argument.

The HS2 estimate for the Golborne Connection of £800m is not credible when compared with the average cost of the whole network. It represents a cost per km of only 28.6% of the average for the line as a whole. Taking the average cost per km for the whole line, excluding costs for stations, tunnelling, and the viaduct over the Manchester Ship Canal, the cost for the Golborne link would be in the region of £2,000m, £1.25bn more than upgrading the West Coast Main Line.

HS2 claim the value of the reduction in journey time is £1.2bn. This is largely composed of the value attributed by business travellers, for whom the time spent on the train they consider to be non-productive. This argument has since been discredited; business travellers will usually be working whilst on the train, so the time is spent usefully. Removing this element reduces the value to £0.4bn.

We believe that the true picture is therefore that the Golborne connection will cost £1.25bn more than upgrading the West Coast Main Line, for an additional value of £0.4bn, clearly not good value for money.

Taken individually, the West Coast Main Line upgrade has a Benefit/Cost Ratio of approximately 1.5 – on the borderline of medium value for money – whereas the Golborne Connection has a Benefit/Cost Ratio of 0.5 – poor value for money, with the costs outweighing the value created.

This clearly demonstrates that the proposed Golborne Connection should be replaced by a connection at Crewe and an upgrade to the West Coast Main Line from Crewe to Golborne. This provides better value for money as well as minimising the impact on the local communities.

1 Introduction

HS2 have proposed to route their main line from London to Glasgow and Edinburgh via the line from Birmingham to Manchester, and then from a junction on the Birmingham - Manchester line at Lymm to Golborne where it re-joins the existing West Coast Main Line. This Golborne Connection runs along the edge of the village of Culcheth near Warrington.

This line is to be built to full high speed rail specification and will be capable of carrying up to 36 trains per hour (one every two minutes) at 225 mph as it passes Culcheth. The actual traffic level is uncertain. HS2 have stated they expect the traffic level to be 6 trains per hour, but this is almost certainly an underestimate. HS2 cannot limit the future line operators to a projected level of traffic.

The Glasgow and Edinburgh traffic will be Classic Compatible stock as it will continue beyond Golborne to Glasgow and Edinburgh on the existing West Coast Main Line, but the line will also carry HS2 full size stock to the maintenance depot at Golborne.

We have been told by the HS2 project that the decision to site the depot at Golborne was taken after, and as a result of, the decision on the route. The depot is at Golborne because the line is there; if the line was removed, the depot would be re-located.

HS2 have considered an alternative, that of transferring the Glasgow and Edinburgh traffic to the West Coast Main Line at Crewe, with some upgrading of the WCML from Crewe to Golborne.

The proposed route will affect all the communities along it. This report mainly highlights the impact on Culcheth, but similar impacts will affect the other communities to a greater or lesser extent.

Culcheth is a large village with a population of 8,600 in 3,500 households (Parish figures). It is situated in a largely rural environment, within the Borough of Warrington, some 6.5 miles north-east of the town centre. 43.5% of local households live in detached accommodation.

The proposed route of HS2 runs along the SW edge of Culcheth village. It would be likely to have a significant and adverse effect on a large number of people and properties in the area, who would derive no benefit from the proposed railway. It runs through Leigh Golf Course which lies within Culcheth, and also the local Taylor Business Park. The loss of the Taylor Business Park would mean uprooting and almost certainly losing the companies there, which currently employ 497 people; these jobs are vital for the local economy and the village. The route would also destroy the 2.5km long Culcheth Linear Park, a vital local outdoor amenity, which adds substantial value to the village. It provides access to the main walking areas, making Culcheth a desirable place to live and thus elevating property prices. None of these have been considered by HS2 in drawing the proposed route or evaluating its impact.

The proposed route will bring no benefits to the area. There is no proposal to build a station in the area, so there will be no transport improvements for local people. The economic benefits projected are confined to the major conurbations, in this case Manchester, and the recent KPMG report (HS2 Regional Economic Impacts, September 2013, Ref: HS2/074) projects a potential that the Warrington economy will actually be harmed by the new line.

2 Impact on the Community

2.1 *Environmental Impact*

There are a number of aspects to the impact on the local environment of the proposed route, none of which are even mentioned in the published economic impact assessment for the project.

Culcheth Linear Park

Culcheth Linear Park is a linear park converted from a disused railway line into a pleasant, open, wooded walk of approximately 2.5 km in length. It provides fresh air and exercise for the local inhabitants, a facility for walking dogs, horse riding, access to wildlife, and also access to the local footpath network, many of which cross or are linked to the park. It has easy access, a small car park, and well made footpaths including some which are tarmac and suitable for wheelchairs. It is the only such facility in the locality.

The main access to the Linear Park is alongside the pre-existing bridge where Wigshaw Lane crosses the park. The proposed HS2 route crosses Wigshaw Lane at the same point, at a very acute angle, via a new bridge, which will of course have to be considerably bigger than the existing bridge. Also the HS2 line, which will be in a cutting at this point, will be considerably wider than the linear park.

The net result will be that the linear park will be cut in two by the HS2 line and the main access point completely obliterated. There will be a short length of linear park remaining on the south side of the bridge, accessible from Warrington Road, which is only suitable for able-bodied visitors, but the main length of the park will be cut off from the main access via Wigshaw Lane. The only access to this part of the remainder will be via unmade footpaths across open fields. As a result, access will be made much more difficult for all and will be prevented for many people, including the disabled, who need to access the park from a vehicle.

The effect of the proposed route will be to destroy the facility in which the community has invested both money and time to create, and which is valued by the large number of the local residents who make use of it.

There is no other similar facility in the locality.

Footpaths

Like many rural locations, Culcheth has a network of historic footpaths which are much valued by many of the inhabitants. The footpaths are well maintained and use is encouraged by the publication of a number of circular walking routes, many based on the Linear Park since many footpaths cross the Linear Park or are linked to it.

The proposed HS2 route will sever many of these footpaths, preventing the many walkers in Culcheth from enjoying the surrounding countryside on the other side of the HS2 line from the village. No footbridges are proposed to carry the footpaths across the line.

Noise

The proposed route runs alongside the edge of the village. There are 947 houses within 500m of the line as it passes the village. These houses, and the rest of the village, will be subject to the noise from trains passing the village at 225 mph at the rate of between 6 and 36 per hour from 5.00 am to midnight, and trains accessing the maintenance depot.

The noise associated with this cannot be other than intrusive and a vast difference from the quiet and tranquil rural environment that the village currently enjoys.

Although some of the line will be in cuttings which will provide some noise reduction, it is not clear how effective this will be, since the height of the trains and overhead power lines will in many parts of the route exceed the depth of the cutting and as a result the noise from the pantographs, a main source of noise, will be entirely unscreened. The line emerges from the cutting in the vicinity of the village in any case, so this part of the line will be unscreened by cuttings.

One of the main attractions of the village is its situation, being in a quiet rural setting but handy for transport and local conurbations. This attraction will be significantly diminished.

Wildlife

A particularly attractive feature of the area is the presence of significant numbers of mature trees, and with them a diverse population of wild birds. Experience elsewhere shows that the passing of high speed trains will result in the population of wild birds disappearing from the landscape.

Disruption during Construction

As well as noise during operation, there will be significant disruption during construction. The line will require cuttings, and also major bridges to be constructed for the line to pass under the three main roads linking the village to Warrington. Construction will inevitably cause major disruption to traffic travelling to and from Warrington. This will have an economic impact (see below) but also the additional traffic, round-the-clock noise, light pollution, and dust associated with the construction will be considerable.

Visual Aspects

In cuttings

The proposed line is in cuttings for part of the length passing Culcheth, but the cuttings are not as deep as the full height of the trains and power lines, so there will still be visual intrusion for much of the length.

Above ground

Part of the line runs at ground level or just below as it passes the village, causing considerable visual detriment due to the height of both the trains and the power lines, which will intrude visually and in particular spoil the rural outlook for that part of the village that lies next to the line. This is a view that currently looks over fields towards the trees that border the linear park, it is much valued by local residents, and this view will be lost.

Bridges

The most obvious visual intrusion will undoubtedly be the large bridges needed to carry the three main roads over the line. Two of these will be over partial cuttings, but even for these the height of the bridge needed to clear the line will be very significant, as will the slope up to the bridge at either side to allow road traffic to surmount the apex. The third bridge, over Wilton Lane, will be almost the full height of the power catenary, and will dominate the landscape in what is a fairly flat piece of countryside typical of the local "Mossland" terrain.

2.2 Economic Impact

There are a number of significant detriments to the local economy due to the proposed route, none of which have been taken into account in the assessment of the route to date. Note these are in addition to the macro economic disbenefit assessed by KPMG in their recently published study for DfT.

Loss of Taylor Business Park

The major local employment site in the community is the Taylor Business Park. This is a successful site hosting a range of businesses, which currently employ 497 people. The Business Park is likely to disappear completely as a source of employment as the proposed line and cutting goes straight through the middle of it. Construction of the line will require the demolition of most of the buildings and, of those that remain, over half will be inaccessible as they will be cut off from the road by the line and its cutting. It is highly unlikely that a significant number of jobs will be retained. Some businesses will no doubt re-locate, taking their jobs with them, but these will not be within the immediate vicinity as apart from the Business Park the surrounding land is Green Belt.

The jobs in the Business Park are good quality employment and reasonably well paid, being mostly skilled, semi-skilled, office and secretarial, and drivers. Salaries for these types of jobs are typically in the range £20,500 to £24,500 pa (source: National Statistics, ASHE 2012). The typical salary would be in the region of £22,500, or £18,118 after tax and NI. The consequent loss of salaries is £ 11.182m per annum, or £9.005m after tax and NI, as a contribution to the local community. It will also represent a loss of £2.177m per annum to the Exchequer in tax and NI contributions. In addition there will be a reduction in corporation tax revenues.

In addition there will be a loss of business rates to the local Borough, currently £ 635,237 per annum, and loss of the business spend with local suppliers.

The loss of net contribution to the local community from the loss of the Taylor Business Park is therefore in the region of £9.64m per annum, increased by whatever multiplier applies to reflect the overall contribution to the local economy taking into account spending in local shops etc. In addition the Exchequer will lose at least £2.2m per annum.

Impact on Shops in Culcheth of Traffic Disruption due to Construction

Culcheth village has a thriving local centre with a number of local businesses. Amongst these are approximately 70 businesses which are of a retail nature, relying on selling to or serving the general public through retail and similar premises. These rely to varying degrees on passing

trade. Disruption of traffic flows through the village due for example to bridge construction will reduce their turnover as the passing trade is diverted elsewhere.

One year ago the village was affected by work on a bridge on Wilton Lane, close to the site of the proposed bridge for the HS2 route. The road was closed for approximately four months. The businesses in the village lost trade as a result, and indeed some went out of business completely shortly afterwards.

We have carried out a survey of the businesses in the village to estimate the impact on jobs of the closure of a single main road for a protracted length of time. Not all the businesses were actively trading when the road was closed last year, but we obtained data from 46 businesses.

Our data (see Appendix 3) indicates that the prolonged closure of Wilton Lane threatened at least 68 jobs in the local businesses. Some of these were part time and the full time equivalent was 42 full time jobs. In addition, some businesses actually closed during or just after the closure of the road, probably at least in part due to the reduction in trade. These were of course not available to participate in our survey.

This closure was for a relatively short period. Prolonged closure due to the three bridges required for HS2 being built consecutively would result in the reduced level of trade translating into real job losses and would threatened the viability of more businesses. Closure of all three roads at once would turn the village into a ghost town, isolated from Warrington the main local centre for employment, business, shopping and administration, and also Birchwood an important local centre. Many jobs would be lost and many businesses closed.

These jobs are mainly retail and sales jobs (average salary £16,867) and catering and other service jobs (average salary £17,161). (Source National Statistics ASHE 2012)

Loss of 42 full time equivalent jobs translates to a loss of £ 604,000 in wages and salaries after tax into the community annually. It would also mean loss of £110,600 in tax and NI to the exchequer.

Summary Table

	Lost wages and salaries	Loss of Business Rates to Warrington Borough Council	Loss to HMRC
Taylor Business Park	£9,005k	£ 635k	£2,177k
Local Businesses in Culcheth Village	£ 604k	Not assessed	£ 111k
Totals	£9,609k	£ 635k	£2,288k
Grand Total	£10,244k		£2,288k

Environmental Impact and House Values

A range of environmental impacts has been outlined in the preceding section. These are difficult to turn directly into financial numbers, but the effect can be seen indirectly through the impact on house prices. House prices reflect how desirable a property is, and this depends partly on the property itself and partly on where it is situated, including the environment. Other things being equal, a drop in house prices when the environment deteriorates or is seen to be about to deteriorate can be attributed to that deterioration.

There are 947 houses in Culcheth within 500m of the proposed line. A typical house in the estate adjacent to the proposed line would have a price in excess of £300,000. Some houses in the area would have lower values, but others would be considerably higher in value, some as high as £1,000,000.

An analysis of the house sales in Culcheth from November 2011 to November 2012 gives an average value per property of £239,000 (103 transactions). The average of all sales from November 2012 to September 2013 (the last month for which data was available) was £215,000 per property (68 transaction), a fall of 10.0%. [Source: Land Registry data.]

Taking the £239,000 value as typical of the values before the announcement of the route for HS2, the total value of the houses within 500m of the proposed line is in the region of £226m.

We have already seen a drop in selling prices in the region of 10% since the route was announced. Experience elsewhere suggests this is not untypical and is likely to increase as construction proceeds.

A 10% drop in value would result in a drop of £23m in the value in total of the houses in this part of the village. A higher percentage drop of course would result in a higher total figure. The houses elsewhere are farther from the line but there are more of them, there are 3,500 households in total in the village as a whole. In addition there would be significant losses in commercial property values due to business closures as a result of the disruption during construction.

It is likely that the overall fall in the value of the property in Culcheth will exceed £50m. This will be a real loss of wealth to the community. It is often argued that such falls in value are only temporary, affecting only those who have to move house during the time when the value is depressed. However in this case this depression will last from 2013 to project completion scheduled for 2032, a period of at least 19 years. It is likely that a majority of the houses in the village will change hands in this time, so most of the residents will be affected.

3 WCML Upgrade vs Golborne Connection

HS2 Statement

The HS2 project have told us that they considered the alternative to the Golborne Connection of upgrading the West Coast Main Line from Crewe to Wigan and putting the Glasgow and Edinburgh traffic on the WCML at Crewe. This would mean it was not necessary to build the connection from Lymm to Golborne at all, nor the junction at Lymm and the viaducts over the Manchester Ship Canal and M62 motorway.

The HS2 statement FOI(P2)13-16 is reproduced in Appendix 1.

Essentially their argument is that the new high speed line would not cost significantly more than upgrading the West Coast Main Line and would result in a saving of 13 minutes on the travel time from London to Glasgow and Edinburgh, which they value at £ 1.2bn.

We do not accept this argument. Our reasons are outlined below.

Value of Time Saved

The HS2 analysis claims that the time saved in travel from London to Glasgow would be 13 minutes and this is valued at £1.2 bn. However the “value of time saved” argument has now been largely discounted as it has been accepted that time spent on trains by business travellers is not time wasted but often represents valuable productive time for those travelling.

An analysis by Alan Debenham (AAD) has shown that the value of time saved is discounted to £0.4bn as a result of this. Extracts from this analysis are attached at Appendix 2.

Cost of New High Speed Line

The cost of the new high speed line from Lymm to Golborne is given as just under £800m. This we challenge.

This cost quoted is for the 35 km of new line and equates to £22.9m per km.

In contrast, the total cost projected for HS2 build (excluding rolling stock) is £42.6bn, for 330 miles of track, equal to 531 km. This equates to £80.2 m per km.

The cost quoted for the link from the Birmingham to Manchester line to the West Coast Main Line at Golborne is thus 28.6% - less than a third - of the cost per km of the whole route, despite the requirement for a major junction at Lymm and the viaduct over the Manchester Ship Canal, itself a very significant engineering undertaking, and the need to bridge the M62.

Removing the contingencies, the cost for the HS2 network is £28.15bn, equating to £53.0 m per km, still more than double the cost quoted for the Golborne connection.

The analysis by Alan Debenham, attached as Appendix 2 to this report, shows that even if the cost of tunnels and stations is excluded from the overall HS2 cost, the figure quoted by HS2 for the cost of the Golborne connection is only 40% of the average cost of the line elsewhere. If the Golborne connection cost the same per km as the rest of the route, excluding tunnels and stations, the cost would be £2.0bn.

In summary, the cost for the Golborne connection to the West Coast Main Line given to us by the HS2 project has been grossly under estimated and the cost of £800m quoted is simply not credible. If costed on a pro rata basis with the rest of the line, it would cost £1.855bn at base cost, £2.8bn with contingencies, and £2.0bn if the costs of stations and tunnels are excluded from the calculation but nothing is added in for the major viaduct over the Manchester Ship Canal. We believe £2.0bn is a more credible estimate of the likely cost.

Cost of WCML Upgrade

The cost for the upgrades to the West Coast Main Line is quoted at £750m. This seems to us to be high, since the length of track actually requiring upgrade is relatively short.

Additional Economic Impact

The HS2 argument does not take into account the impact on the local communities of building the line. Despite the fact that they are required to minimise the impact on the communities the line passes, they have not considered this.

We have estimated that, for the Culcheth community, the result of the line being built would be a loss of value of the housing stock in the range of £50m, and ongoing annual wage and salary losses to the local economy in the region of £9.609m pa and to the local council of £ 0.635m pa. This is only for the Culcheth community, there are of course other communities along the line who would also be affected. A discounted cash flow valuation of the ongoing annual losses would value these in excess of £100m at 10% discount rate and £200m at 5%.

New Cost/Benefit Balance

We have presented arguments above which would have the effect of revising the HS2 figures as follows:

Golborne Link Proposed by HS2

	HS2 figures	Revised figures
Cost of Golborne Connection	£800m	£2,000m
Effect of Environmental Impact on Property Valuation	Not considered	£50m loss in value
Lost income to Local Communities	Not Considered	£10.244m per annum
Lost income to National Government	Not Considered	£ 2.288m per annum
Benefit of Time Saved	£1,200m	Discounted (AAD calculates £400m, see Appendix 2)
Benefit to Local Economy	Not Considered	Nil (may be a disbenefit, see KPMG figures)

Clearly the cost benefit balance has tilted and the costs of the Golborne link, if properly assessed, will outweigh the benefits. Total costs are in excess of £2,000m whereas the benefit of time

saved is worth much less than the £1,200m originally estimated by HS2, probably in the region of £400m.

This can be seen most clearly in the Benefit – Cost Ratio (BCR) which indicates whether the value of the benefits exceed the costs (BCR greater than 1) or the value of the benefits are less than the costs to achieve them (BCR less than 1).

Alan Debenham has estimated (see Appendix 2) that the BCR for the Golborne connection is 0.5 which indicates that the benefits are much less than the costs of the connection and in fact this value is in the range classified by the DfT as “poor value for money”.

This shows that there is no case for building the HS2 Golborne connection.

West Coast Main Line Upgrade

Little consideration has been given by HS2 to the alternative of upgrading the West Coast Main Line between Crewe and Golborne.

HS2 have estimated the cost at £750m, based on a high level analysis only. This seems high, but is significantly less than a credible estimate of the cost of building the Golborne Connection.

The benefits to users from the upgrade would be similar to those of the Golborne Connection apart from the time savings, which have been discounted now. In addition there would be very significant benefits to the local and regional population and economy from having a station at Warrington on the main line from London to Glasgow and Edinburgh.

Even without the regional benefits, Alan Debenham estimates (Appendix 2) that the BCR for the West Coast Main Line upgrade is about 1.5, i.e. the benefits outweigh the costs. This places it on the border of the DfT’s medium and low value for money categories.

This indicates that upgrading the West Coast Main Line between Crewe and Golborne to take the HS2 traffic to Glasgow and Edinburgh is about three times more cost effective than building the Golborne Connection. This difference would widen considerably if the benefits to the wider region were included (see extracts from Alan Debenham’s report in Appendix 2).

Looked at overall, we believe the Golborne Connection will cost £1.25bn more than upgrading the West Coast Main Line for an additional value of £0.4bn, clearly not good value for money.

4 Conclusion

The proposal by HS2 to link the Birmingham/Manchester line to the West Coast Main Line via a connection from Lymm to Golborne has been proposed by HS2 in order to allow Glasgow and Edinburgh trains to proceed north on the West Coast Main Line, saving 13 minutes on the journey time to Glasgow. The value of this time saving, originally estimated by HS2 at £1.2bn, has been significantly reduced as it relied principally on the assumption that business travellers regarded time on trains as time wasted, an assumption that has now been proved false.

The Golborne Connection would have major environmental and economic impacts on Culcheth and the other communities that it passes. These impacts have not been considered by HS2 in planning the line. In the case of Culcheth the impact can only be described as devastating.

The environmental impacts include the destruction of the Culcheth Linear Park, the main location for outdoor recreation in the village; the loss of access to local footpaths; destruction of local bird populations and other wildlife impacts; the impact on the local golf course; and the noise and loss of visual amenity resulting from the presence of the line. In addition, during construction there will be additional noise, dust, pollution, and traffic disturbance.

Economic impacts on Culcheth include the loss of 497 jobs in the Taylor Business Park, at least a further 68 in Culcheth village itself, consequent loss of £10.244m per annum income to the local community and also at least £2.3m per annum to the Exchequer, and a reduction of £50m in the value of property in the village.

The costs of the Golborne connection, if properly assessed, would exceed the benefits by a significant margin, resulting in a significant loss of value and giving a BCR in the region of 0.5, indicating poor value for money.

The alternative to the Golborne Connection considered by HS2 in their FOI response is to upgrade the West Coast Main Line where needed from Crewe to Wigan and transfer the Glasgow and Edinburgh traffic to the WCML at Crewe instead of Golborne. This would render the Golborne Connection unnecessary.

This alternative would be lower cost to the project, provide greatly improved value for money, and also minimise the impact on the local communities.

As a result, upgrading the West Coast Main Line would achieve the same end as the Golborne connection at much lower cost. The BCR for this is estimated at 1.5, even without taking account of wider economic benefit to the Mersey Valley, suggesting it is much more cost effective than the Golborne connection, and provides much better value for money.

Acknowledgements

Thanks are due to the members of the CADRAG committee for help and support in drafting this document, particularly to Paul Taylor who provided the data on the Taylor Business Park and Alan Dee who provided the data on house prices, also to Alan Debenham for permission to use the extracts from his Review of HS2 Economic Case and Regional Impact Study.

Appendix 1 Response received from HS2 to FOI request for information on the Golborne Connection



Alan Debenham
alandebenham@btinternet.com

2nd Floor
Eland House
Bressenden Place
London SW1E 5DU

11th March 2013

REQUEST FOR INFORMATION

Reference: FOI(P2) 13-16

Dear Mr Debenham,

I am writing regarding your request for information received 11th February 2013. Your request has been considered under the Environmental Information Regulations (EIR) 2004.

In your email you requested the following information:

I would like to study the cost-benefit analysis for the spur of HS2 Phase 2 which runs from Hoo Green, Cheshire to Bamfurlong, Borough of Wigan, including Warburton, Culcheth, Lowton and Golborne.
(ie a cost-benefit analysis specifically for this spur, separated out from the cost-benefit analysis of HS2 Phase 2 as a whole). I have not found this in the published information about HS2 Phase 2.

I would be grateful if you could you inform me of the following:

- 1) Whether a cost-benefit analysis has been done specifically for this spur, and if not, why not? I would presume it has, since it is a part of the cost-benefit analysis for HS2 Phase 2 as a whole.
- 2) If it has, whether it has been published. If so, please would you provide me with a reference.
- 3) If it has been done but not published, whether you could provide me with the information on the costs and benefits of this spur.
- 3) If it has not been done, whether it will be done and by when.
- 4) If it will be done, whether it will be published and by when.
- 5) Whether you could provide me with a copy when it has been done.

We have not conducted a full examination of the costs and benefits of the spur to Golborne as a stand-alone proposition as our [initial remit from the DfT](#) required us to provide a link to the WCML and a connection at Golborne was judged the best option considered taking into account engineering complexity, cost, journey time, and impacts on communities and the environment. We have however conducted some very high level analysis using existing data to give an idea of the potential benefits of a Golborne

High Speed Two (HS2) Limited, registered in England.
Registration number 06791686. Registered office Eland House, Bressenden Place, London SW1E 5DU



link over and above the rest of the line of route to Manchester. This high level analysis can be found in Annex A.

If you are unhappy with the way we have handled your request or with the decisions made in relation to your request, you may complain in writing to HS2 Ltd at the above address. Please also see attached details of HS2 Ltd's complaints procedure and your right to complain to the Information Commissioner.

Please remember to quote reference number FOI(P2) 13-16 in any future communication relating to this request.

Yours sincerely,

Josh Russell
Freedom of Information

Western Leg Golborne Connection

Subject: Golborne Connection

Author: XXXX

Background

1. The selection of the initial preferred line of route as the Western route option means that there are two connections to the WCML. The first at Crewe has contributed to the selection of the Western route as the preferred option, the second at Golborne, allows quicker journey times to Preston and Scotland. This paper looks at the wider evidence currently available in support of the Golborne connection.

Golborne Connection

2. The Golborne connection diverges from the Manchester spur to the south west of Manchester and connects to the WCML just north of Golborne providing 35km of new high speed route. The cost of this section, including the full delta junction from the line into Manchester, is just under £800m in 2011 factor price construction costs. The connection at Golborne will also deliver a journey time reduction to Preston, and Scotland of 13 minutes.
3. If only the Crewe connection were to be provided, then to run the level of service up to Preston and Scotland, for both the existing classic services and the high speed services as specified, would require additional work to enhance the capacity of the existing WCML. This would require widening and 4-tracking of the 24km of 2-track WCML from the north of Crewe to south of Warrington, and a two kilometre 2-track section at Earlstown, north of Warrington which is in a constrained cutting. In addition, Crewe station junction would not be configured to support the increase in services to Liverpool and Scotland. We believe that the area would become saturated and both Crewe Station and the Junction would need to be remodelled or an additional grade separated junction from the high speed line to the north of Crewe tunnel would need to be provided, both at additional cost. We have not looked in detail at this work or the potential associated costs, however a high level estimate suggests this could cost at least £750m, almost as much as the cost of the high speed connection. Therefore on an incremental basis over the cost of the WCML work, we estimate a very limited additional cost to provide the second connection to the WCML at Golborne. Although the WCML modifications may appear to be expensive when compared to the cost of the High Speed route section, this is associated with disruptive working in a constrained corridor alongside the operational railway.
4. If we now focus at looking at the potential benefits from such a connection. We have not done a specific test that would look in particular at the impact of the Golborne junction as this goes beyond our original remit. However we have done a test which looks at the benefits from a journey time decrease of 10 minutes to Preston and 13 minutes to Scotland. This test is the best evidence available –



though it was conducted on older versions of the model and service patterns. It also removed stops on some stations (particularly Wigan).

5. The test indicates the value of fast journeys would be of the order of £1.2bn and revenue of around £600m. This suggests the Golborne connection would provide very high value for money even if we ignored the cost of the work required on the WCML.
6. We believe that some of the changes to assumptions recently, particularly the adoption of PDFH 5 elasticities in WebTAG, will tend to reduce the benefits of the Golborne connection, however indicative tests that have been conducted similar the one above that suggest the BCR is likely to remain comfortably above 2 for this connection even if we ignored the cost of the work required on the WCML.

Your right to complain to HS2 Ltd and the Information Commissioner

You have the right to complain to HS2 Ltd within two calendar months of the date of this letter about the way in which your request for information was handled and/or about the decision not to disclose all or part of the information requested.

Your complaint will be acknowledged and you will be advised of a target date by which to expect a response. Initially your complaint will be re-considered by the official who dealt with your request for information. If, after careful consideration, that official decides that his/her decision was correct, your complaint will automatically be referred to a senior independent official who will conduct a further review. You will be advised of the outcome of your complaint and if a decision is taken to disclose information originally withheld this will be done as soon as possible.

If you are not content with the outcome of the internal review, you have the right to apply directly to the Information Commissioner for a decision. The Information Commissioner can be contacted at:

Information Commissioner's Office
Wycliffe House
Water Lane
Wilmslow
Cheshire
SK9 5AF

Appendix 2 Extracts from a Review of HS2 Economic Case and Regional Impact Study by Alan Debenham

**Extracts from Review of HS2 Economic Case and Regional Impact Study -
A A Debenham November 2013**

Disclaimer: The author does not guarantee the accuracy, completeness or usefulness of the information contained within this review. He cannot accept liability for any loss or damages of any kind resulting from reliance on the information or recommendations this document contains.

Extract from: Executive Summary

During this review, it was established that HS2 Ltd has not conducted a full examination of the costs and benefits of the spur of HS2 from Hoo Green in Cheshire to Golborne in Wigan Metropolitan Borough as a stand-alone proposition. HS2 Ltd have only communicated a 'very high level analysis' via a FOI reply using existing data to 'give an idea' of potential benefits of the Golborne spur over the rest of the route into Manchester. In the reply, the benefit given is entirely attributed to time savings (10 minutes to Preston and 13 to Scotland with no stop before Preston).

The brief indication of cost-benefit of the spur in the reply is invalid and misleading because:

1. The capital cost is grossly underestimated. The capital cost estimated is 40% of the pro-rata cost with respect to HS2 as a whole, excluding stations and tunnels. This is not credible, especially considering the requirement for the large viaduct across the Manchester Ship Canal, as described below.
2. The operating cost has not been mentioned and the indications are that this has been either neglected or grossly underestimated.
3. The Transport User Benefit of time-savings has been substantially overestimated in the October 2013 Economic Case, owing to the assumption that business passengers do not work on the train (or put differently, by falsely claiming additional benefit from doing work in the time saved, which is no more than would have been done on the train), or, instead of this, by overestimation of business passengers' willingness to pay substantially more than other passengers for time savings. The overestimate arises from undue influence of out of date preferences, particularly revealed ones, with undervaluing of stated ones, contrary to continuing trends in the modern business environment, and insufficient account of extrapolating these trends into the future for applicability to HS2. Evidence, albeit limited, from current Eurostar and WCML fares, supports this assessment.

The BCR for the spur is estimated to be about 0.5 after addressing the above deficiencies. This is well down into the DfT's 'poor value for money' category. Even when the DfT's value per hour of business passengers time savings is reinstated, the BCR rises only to 0.8, still in the 'poor value for money' category.

It is difficult to see what the wider benefit of the spur itself would be, given the following attributes:

It offers no benefit to the large Mersey Valley conurbation since it is not proposed to stop there and it bypasses Warrington, a potential major beneficiary. It carves through green belt land which is precious in this populated area. It will require a viaduct proposed to be 100 feet (30m) high over the Manchester Ship Canal. This will need to be about 1.3 miles long to limit the

gradient to 1 in 40. It will tower 75 feet above the A57 before reaching ground level just outside the village of Glazebrook. In Culcheth, it will blight houses and destroy farm buildings, an industrial estate with about 38 businesses and 497 employees, and the local park (apparently not even recognised in HS2 documentation), before going on to Lowton where it will destroy residential housing.

The time-saving between Crewe and Preston, estimated by HS2 Ltd, is just 10 minutes, achievable only because trains on the spur do not stop anywhere in the region before Preston.

The above assessment shows that there is no case for including the Hoo Green to Golborne spur in the HS2 project. This review strongly indicates that the spur is 'poor value for money', indeed a likely loss maker, without demonstrated benefits to the region, but with substantial environmental detriments. The spur has not been justified as the best option, either in terms of cost-benefit or benefit to the region or the environment. Whilst alternative upgrading of the WCML has been indicated by HS2 Ltd as viable and less expensive, this review shows that much more serious analysis and assessment of this option needs to be done, with a view to taking it forward as the preferred option. This is particularly so since the costs of the spur have been grossly underestimated, per se and in relation to weak and uncertain benefits.

This is in complete contrast to the estimates of the BCR for the WCML upgrade option in this review which are 1.5 without Wider Economic Impact and 4.5 with Wider Economic Impact. The latter is in the DfT very high value for money category and is 9 times the value estimated in this review for the Golborne spur. This reflects the transport benefit from non-time saving contributions associated with capacity relief and the substantial economic benefit that Warrington could receive from this option. These are tangible benefits to businesses and the community, and should be given higher priority than the exaggerated worth of very small time savings on which the above mentioned brief FOI reply is solely and wrongly based.

Extract : Link from HS2 to the West Coast Main Line

The spur of HS2 from Hoo Green in Cheshire to Golborne in Lancashire has not been justified as the best option, either in terms of cost-benefit or benefit to the region or the environment.

The spur as proposed offers no benefit to the large Mersey Valley conurbation since it is not proposed to stop there and it bypasses Warrington, a potential major beneficiary. It carves through green belt land which is precious in this populated area. It will require a viaduct proposed to be 100 feet (30m) high over the Manchester Ship Canal. This will need to be about 1.3 miles long to limit the gradient to 1 in 40. It will tower 75 feet above the A57 before reaching ground level just outside the village of Glazebrook. In Culcheth, the line will blight houses and destroy farm buildings, an industrial estate with about 38 businesses, and the local park (the existence of which is unrecognised in HS2 documents) before going on to Lowton where it will destroy residential housing.

The time-saving between Crewe and Preston estimated by HS2 Ltd is just 10 minutes, achievable only because trains on the spur do not stop anywhere in the region before Preston.

It seems from the above that neither HS2 Ltd nor the Government have given the consideration or level of attention warranted by the need to maximise benefit and

minimise detriment to this area of high population density or even to balance these between the region and the country. This is reinforced by replies in FOI (P2) 13-16 and its Appendix A from HS2 Ltd to questions put to them on cost-benefit analysis of the spur, for example:

‘We have not conducted a full examination of the costs and benefits of the spur to Golborne as a stand-alone proposition as our initial remit from the DfT required us to provide a link to the WCML, and a connection at Golborne was judged the best option considered, taking into account engineering complexity, cost, journey time, and impacts on the community and environment.’

It is difficult to see how driving a new line through scarce green belt land, with the above mentioned destruction, and a train that does not stop anywhere in the region, can possibly be better than upgrading an existing line (eg West Coast Main Line (WCML)). The value of journey time savings has been very much exaggerated as discussed elsewhere in this review. The cost-benefit is discussed below. The remit did not obviate the need for a sufficiently detailed analysis to distinguish between different WCML linkage options, including the one at Crewe. It does not appear from the replies below that sufficiently detailed and convincing analyses were done:

‘We have not done a specific test which would look in particular at the impact of the Golborne junction as this goes beyond our original remit’.

‘We have however conducted a ‘very high level analysis using existing data to give an idea of the potential benefits of a Golborne link over and above the rest of the line of route to Manchester.’ (see below)

The ‘high level’ analysis referred to above is a ‘test which looks at the benefits from a journey time decrease of 10 minutes to Preston and 13 minutes to Scotland.’ This is said to be ‘the best evidence available – though it was conducted on older versions of the model and service patterns. It also removes stops on some stations (particularly Wigan). The test indicates the value of fast journeys would be of the order of £1.2B and revenue of around £600M.’ HS2 Ltd says ‘this suggests the Golborne connection would provide very high value for money even if we ignored the cost of the work required on the WCML’. The last remark appears illogical. If the work on WCML referred to is work for implementing the current HS2 proposal, ignoring it would only worsen the BCR. If it is to do with an alternative proposal, it is not relevant. As shown below, this value for money claim is wrong probably for the reasons identified.

FOI (P2) 13-31 gives further clarification of ‘the £1.2B estimate of the ‘value of fast journeys: ‘The estimate of the £1.2B benefits comes from a run of our economics model, called the PLANET framework Model (PFM) and provides an order of magnitude to the potential level of benefits’. ‘The run looked at the benefits that would come from a journey time benefit from Crewe of 13 minutes to Scotland and 10 minutes to Preston’. ‘Although this test was undertaken for a different purpose it does however provide the benefits of a journey time savings similar to that delivered from the Golborne connection, although we would expect this to be an underestimate as the time saving to Preston is less than the Golborne connection would deliver.’

Transport User Benefit

In this review, the ‘value of fast journeys’ (£1.2B) is therefore taken to be the total value of time savings for business and other passengers. Table 4 of the ‘Economic Case for HS2 :

Updated Appraisal of Transport User Benefit and Wider Benefits, January 2012', gives a breakdown of transport benefits for the Y network, from which the ratio of total benefit to journey time-saving benefit can be obtained (ie about 1.8). Scaling up the above value of time-savings for the spur by this factor, gives an estimate of the **total Transport User Benefit for the spur (ie about £2.1B)**.

(Neither FOI (P2) 13-16 nor its Appendix A refers to non time-saving Transport User Benefits, including capacity related benefits, such as those included in Table 4 of the Updated Appraisal report. This, together with the lack of reference to operational costs, as addressed below, is indicative of a simplistic and ill-considered analysis).

Table 15, p85, of the Economic Case for HS2, October 2013, gives values for 'other quantifiable benefits' and 'loss to the government of indirect taxes'. The sum of these quantities for the spur is about -£0.07B, a pro-rata figure with respect to Total Transport Benefit between that in Table 15 and that above for the spur. Hence, the **Net Transport Benefit for the spur, based on these figures, is about £2B**. However, this figure includes a contribution from the value gained by business passengers by working in the saved time, which is only realised by assuming that they do not work on the train. Since this is clearly false, the Transport User Benefit is revised here to remove this contribution and instead uses a value of the time saved by business passengers per hour equal to that of leisure passengers.

A figure was estimated for the ratio (ie about 1/3) of the total value of time saved by the spur, with the latter assumption (ie about £0.6B), to the total value of the time saved, with the value of business passengers' time-saving corresponding to the assumption of their not working on the train. (ie about 1.7).

The latter was estimated from summing the values of hours saved by the spur by business passengers (ie about £1.3B) and other passengers (ie about £0.4B). These latter two figures were obtained by multiplying the respective passenger time-saving values per hour (ie £47 and £6 per hour respectively) by the corresponding number of passenger hours saved (ie about 29m and 71m respectively). The same time-saving values per hour were used to estimate the number of business and other passenger hours on HS2 as a whole (ie about 0.46B and 1.1B hours) from their respective Journey Time Saving benefits in Table 4 of the Update Appraisal, January 2012, after scaling for consistency with the August 2012 Economic Case. The ratio of the number of business hours to the sum of business hours and other passenger hours (ie about 0.3) was multiplied by the total time saved over the 60 year appraisal period by the spur (ie about 100m hours) to give the above 29m figure. Subtracting this from 100m gives the above 71m figure. The total time saved by the spur was estimated by multiplying an estimated number of passenger journeys per day (ie 30,000) and 10 minutes time saving per journey. The former is based on an assumption of 6 trains per hour, each carrying 500 passengers for 10 hours per day. (The Transport User Benefit does not depend on the correctness of these train and passenger figures since a ratio is obtained below which is applied to the value of the total value of time savings for business and other passengers given in FOI (P2) 13-16 (ie £1.2B). The higher value of £47 per hour for the value of business passenger saved time was used to correspond to the Updated Appraisal report, January 2012, and so give the right split between business and other passenger hours saved, on which the ratio *does* depend. Using the October 2013 values per hour of time saved, the total value of time saved, using the above train and passenger numbers, is $(29 \times 32) + (71 \times 6) = \text{about } £1.3B$, which is close to the HS2 Ltd figure of £1.2B.

The above total value of time saved by the spur, with the assumption that the value of the time saved by business passengers per hour is equal to that of leisure passengers (ie about £0.6B), was estimated by summing a) the product of the number of business passenger hours saved by the spur (ie the above 29m hours) and the value of time-saved per hour (set to the leisure value as referred to above), and b) the value of hours saved by the spur by other passengers (ie the above £0.4B).

The total value of time savings for business and other passengers (the above £1.2m) is multiplied by the ratio (ie the above 1/3) of the total value of time saved by the spur, with the value of business passengers time-saving per hour at the leisure rate, to that with the value corresponding to the assumption of their not working on the train. The result (about £0.4B) is the value of the total time saved by the spur with the former assumption. (Note that, as the ratio is being used, the calculation of the Transport User Benefit does not depend on the specific values of the numerator and denominator, the ratio of which is fixed by the Journey Time Savings in Table 4 of the Updated Appraisal, January 2012)

The ratio (0.3) was checked, as follows, against the equivalent figure for HS2 as a whole using figures in Table 15 of the October 2013 Economic Case. A ratio (ie 0.65) of the value of business passenger time savings to total business benefit is given by Table 4 of the Update Appraisal. Multiplying this by the business transport user benefit in Table 15 of the October 2013 Case (ie £40.5B) gives the business user benefit from time-savings (ie about £26B). Multiplying this by the ratio of the value of time savings per hour to leisure passengers (ie £6), to that for business passengers (ie £32), gives the business user benefit of time-saved at the leisure passenger rate (about £4.8). The Journey Time Saving in Table 4 of the Updated Appraisal is scaled up to the October 2013 Case to give the time-saving user benefit for other passengers (ie about £7.3B). Adding the latter two figures gives the total value of time saved for HS2, with business passengers time-savings valued at the leisure rate (ie about £12B). This is divided by total value of the time saved (ie £26+ £7.3 = £33.3), with the value of business passenger time-saving, corresponding to the assumption of their not working on the train. The result, corresponding to the 0.33 value for the spur, is about 0.36. This gives some confidence that the figure for the spur is about right.

Subtracting the value of the total time saved by the spur, with the business time savings value equal to the leisure rate, (ie the above £0.4B) from the total value of time savings for business and other passengers (ie the above £1.2B) gives the reduction in Transport User Benefit for the spur resulting from business passengers time-savings benefit being at the leisure rate. (ie about £0.8). Subtracting this from the Net Transport Benefit for the spur estimated above (ie about £2B) gives the Transport User Benefit for the spur resulting from business passengers time-savings benefit being at the leisure rate. (ie about £1.2B).

Capital Cost

In FOI (P2) 13-16 Appendix A, HS2 Ltd states that 'the (capital) cost of this section (the spur), including the full delta junction from the line into Manchester, is just under £800M in 2011 factor price construction costs'. This is only 40% of the pro-rata capital cost of HS2 in respect of the track length, excluding costs of tunnels and stations. The capital cost of the spur is estimated below:

The length of the spur is taken to be 30km based on the route diagrams published on the HS2 website. The track length for the whole HS2 network is given as 330 miles on the HS2 website. This includes about 10km of track on two sides of the delta connection with the route into

Manchester, which would not be needed without the spur. The ratio of the capital cost of the spur to that of HS2, as described above, is then at least 0.056.

A breakdown of costs is given in the HS2 Cost and Risk Model Report, March 2012. This gives the total cost as £33.4B at Q2 2011 Prices. Removing the cost of tunnels and stations, of which there are currently none on the route, and scaling up to the capital cost of HS2, given in the October 2013 Economic Case, gives £34.8B as the cost which should be multiplied by the above ratio. **The resulting capital is about £2B, but the actual cost could be significantly higher than this since it excludes most of the cost of the large viaduct required on the route as described above.** The cost of the stations and tunnels removed amounts to £5.7B, 14% of the whole HS2 capital cost in the October 2013 Economic Case.

HS2 was asked why the estimated capital cost of the spur in FOI (P2) 13-16 Appendix A is so much less than the pro-rata cost per mile. The following reply was received in FOI (P2) 13-31.

‘ The total cost for the route between the West Midlands and Manchester has been calculated using quantities that are derived from the engineering design, this includes more expensive elements such as the 12km tunnel approaching Manchester Piccadilly and less expensive elements such as the at grade section to the north of Crewe. In addition to this the cost includes location specific risk items, land and property purchase costs, all of which have local influences on each route section.’

In consideration of this reply and the above calculation, it is concluded that the capital cost of the spur must have been substantially underestimated.

Operating Cost

As operating costs were not mentioned in FOI (P2) 13-16 or its Appendix A, HS2 Ltd was asked ‘ What is the cost, additional to your estimated £800m cost of the spur, of operating and maintenance of the spur over the 60 year evaluation period?’. The reply was ‘ We have not calculated the maintenance costs just for the Golborne spur, however they are included as part of the overall costs of the scheme. Our published cost model (which can be found on the HS2 Ltd website on a spreadsheet called ‘ ‘ Day 1 & Y costs’’) contains the assumed cost per track kilometre.’ The spreadsheet gives the operating cost which is included in the Economic Case.

The only way it can be conjectured that a BCR in the DfT very high value category (ie greater than 4) could be obtained, as claimed in FOI (P2) 13-16 Appendix A, is if the operating cost were omitted or grossly underestimated. This is also indicated by the above reply.

In its BCR, the spur must bear its share of the overall HS2 operating cost, which is given as £22.1B in Table 15 of the October 2013 Economic Case. **The pro-rata operating cost for the spur with respect to track length, or capital cost as estimated above, is then about £1.2B.**

Revenue

The revenue estimated in FOI (P2) 13-16 Appendix A has not been assessed here. However, it could be that the figure is more appropriate to the BCR with business passengers assumed to work on the train, as is the case here, than the BCR in the Economic Case. As referred to in the section on HS2 Transfer User Benefits, the revenue estimated by HS2 could be overestimated since it comes from real-life data which reflects the real situation in which business passengers

do work on the train and the gain in terms of additional work in time saved is thereby lessened or eliminated.

BCR for the spur

From the above:

Net transport benefit = £1.2B

Capital cost = £2B

Operating Cost = £1.2B

Revenue = £0.6B (assumed as in FOI (P2) 13-16 Appendix A)

Net cost to the government = £2.6B

The BCR of the spur is about 0.5 ie in the DfT poor value for money category

The above net transport benefit above assumes that the value of time saved is the leisure value for business passengers, as explained above, and the October 2013 values for other passengers. The BCR would then be lower than this if the other passengers did not value the time-saved to the extent assumed, as considered in this review (eg as in the comparison of Eurostar and WCML fares and because of offers of cheaper deals which dominate the time saving consideration)

Subtracting from the above net transport benefit, the value (£0.4B in *Transport User Benefit* above) of the total time saved by the spur, with the value of business time savings equal to the leisure rate, gives £0.8B as the value of the non time-savings Transport User Benefit. Thus, contrary to FOI(P2) 13-16 Appendix A, any rail capacity or road congestion relief benefit of the spur, and actual passenger time-saved, should already be allowed for in the above BCR estimate.

It is then difficult to see what the wider benefit of the spur itself would be, especially as the spur is a bypass of Warrington, it does not stop anywhere in the region, the time saving is small and the environmental damage considerable. HS2 should say what wider benefits are accrued specifically by the spur.

With a Transport User Benefit of £2B, which includes the gain by business passengers through working in the time saved, as in the October 2013 Economic Case, (which is only realised by assuming they do not work when they are on the train), the BCR becomes 0.8.

The above assessment shows that there is no case for including the Hoo Green to Golborne spur in the HS2 project. This review strongly indicates that the spur is 'poor value for money', indeed a likely loss maker, without demonstrated benefits to the region, but with substantial environmental detriments. Alternative upgrading of the WCML has been indicated by HS2 Ltd in FOI(P2) 13-16 Appendix A to be viable and less expensive. However, this paper also shows the lack of consideration of this alternative in stating that 'We have not looked into detail at this work or the potential costs, however high level estimates suggests this could cost at least £750m, almost as much as the cost of the high speed connection.' However this estimate seems high compared to the HS2 Ltd estimate for the spur, considering the relative magnitude of the works on the two routes. In answer

to a question, FOI (P2) 13-38 confirms that the work on the WCML upgrading alternative to the spur described in FOI (P2) 13-16 Appendix A 'addresses the capacity constraints only' and that HS2 Ltd had 'not considered any additional work to improve journey time from Crewe north to Golbourne Junction on the existing railway.'

This review shows that much more serious analysis and assessment of the WCML upgrade option needs to be done with a view to taking it forward as a preferred option. This is particularly so since the costs of the spur have been grossly underestimated, both per se and in relation to weak and uncertain benefits.

The above conclusions are reinforced by the following estimate of the BCR of the upgraded WCML option:

BCR for WCML Upgrade

Transport Use Benefit = £0.8B (ie the non-time savings benefit discussed just below the BCR estimate for the spur above)

The HS2 Ltd high level capital cost estimate above = £0.75B

Operating cost pro-rata to capital costs of the spur and HS2 as a whole = £0.4B

Revenue, as estimated by HS2 for the spur and assumed to be the same for a WCML upgrade, = £0.6B

The BCR for the WCML upgrade option is about 1.5 ie on the borderline of DfT medium and low value for money categories.

With the above assumptions, the WCML upgrade option is about 3 times more cost-effective than the spur. This difference would widen further if, as expected, the WCML would offer significantly greater wider benefits to the Mersey Valley area than the spur which is serving only as a very slightly faster transit route to Preston and Glasgow.

Wider economic benefit can be obtained by improved connectivity between businesses, suppliers and consumers, and by improvements in the functioning of the labour market. These may be achieved by relocation to reduce costs of production and costs of services to customers.

As an indication of the wider economic benefit that could be expected from the WCML upgrade alternative to the Golborne spur, an estimate is given below of the economic benefit from additional business connectivity with Warrington it could provide. The percentage increase in business connectivity with Warrington is estimated below and used to estimate the economic benefit to Warrington of this.

The existing connectivity by rail with Warrington is estimated in terms of the number of rail passengers on trains which stop at Warrington stations. The increase in rail connectivity due to the WCML upgrade is estimated in terms of additional number of passengers on the increased number of trains stopping at Warrington owing to the upgrade. The ratio of the latter to the former then gives the fractional, and thus percentage, increase in connectivity of business passengers and any other type of passenger.

The number of trains currently stopping at Warrington stations is obtained from the cheshirebytrain.co.uk website which gives the timetables for the companies that operate trains through these stations. The approximate numbers of trains stopping at Warrington on each working day for each of these services is given in brackets, as follows, for Bank Quay: Virgin on the WCML (79), Northern Rail on the Liverpool to Manchester line through Earlestown (20) and Arriva Trains Wales (56); for Warrington Central: Northern Rail on the Liverpool to Manchester line through Birchwood (104), First TransPennine services to Scarborough (26) and the north-east (34), and East Midlands Trains to Norwich (30)).

The approximate train capacities, which are given in brackets, of the types of trains running on the corresponding routes are obtained from the web, associating Pendolino Class 390 with Virgin services on the WCML (average 500), Class 142 Pacer and 150 Sprinter on Northern Rail via Earlestown, (average 88), Class 150 sprinter on Arriva (73), Class 142, 150 and 153 on Northern Rail via Birchwood (average 85), Class 185 Desire on First TransPennine services (169) and Class 158 Express Sprinter on East Midlands route to Norwich (147).

Multiplying the numbers of trains by the capacity of trains on each route and summing gives an estimate of the total number of passengers on trains, at full capacity, which stop at Warrington on each working day (ie 68,738).

The number of additional passengers on trains, at full capacity, which stop at Warrington on each working day if the WCML were upgraded to take the passengers who would otherwise go past Warrington on the Golborne spur, is estimated as 42,900, by multiplying the number of trains (3 each way per hour) by the train capacity (550) and the time period corresponding to the total number of train running each day. The latter (ie 13 hours) is taken to be the number of Virgin trains stopping at Warrington each day (the above 79) divided by the number of trains on the WCML upgrade (6 per hour). The ratio (ie 0.62) of the number of additional passengers to the number of existing passengers is the fractional increase in the number of passengers which would visit Warrington if the percentage of capacity taken up and the proportion of passengers visiting Warrington on the WCML upgrade are the same as that on existing lines. This applies to any type of passenger and thus business passengers.

The economic impact per year of this increase in business connectivity is estimated by multiplying the above fractional increase in passengers by an elasticity of productivity to rail business connectivity and by the annual GVA (Gross Value Added) for Warrington. (this elasticity means that productivity is increased by 1% if rail connectivity for business increases by 100%, ie doubled, with an elasticity of 0.01)

A nominal value of 0.01 is selected for this elasticity, in consideration of comments by a transport economics expert (Prof. Overman) on the KPMG report, as referred to in the 'Y Network' section of this review. (The KPMG elasticity for rail access to businesses is 0.06 for the consumer services sector and 0.073 for the producer services sector. See Table 20 of the KPMG report).

The GVA per capita in the north-west of England is about £23K (Office for National Statistics) and the population of Warrington is 202,288 (2011 census, Office for National Statistics). The GVA for Warrington is then about £4.6B per year.

The above mentioned product therefore gives an estimate of Wider Economic Benefit to Warrington of the WCML upgrade option, due to increased business connectivity, of £28.5M per year or about £1.7B over 60 years.

The Transport User Benefit in BCR for WCML Upgrade above then becomes £2.5B.

The BCR for the WCML upgrade option, including the Wider Economic Benefit of increased business connectivity to Warrington is then about 4.5 ie in the DfT very high value for money category. This is 9 times higher than the above estimate for the Golborne spur.

Given the assumptions, albeit reasonable, in the above derivation, the veracity of the wider economic benefit (ie £1.7B over 60 years) may be checked by comparing it with published estimates for HS2 with track length pro rata. The present estimate is just over twice that corresponding to the Wider Economic Impact in the October 2013 Economic Case. (If this pro rata figure (£0.75B) were used in the above BCR calculation, the result would still be about 2.8 ie in the DfT high value for money category). Compared to the KPMG estimate of Wider Economic benefit for whole HS2, which this review concludes is a great overestimate, the present estimate of the wider economic benefit to Warrington is about 30 times less pro rata.

Annexe

Value of business passenger in-train time savings.

Following a 'Valuation of Travel Time Savings for Business Travellers' by the Institute for Transport Studies (ITS) , University of Leeds, April 2013, the DfT has reduced its guidance value from about £47 per hour used in the August 2012 Case to about £32 per hour in the October 2013 Case. (Table 1 of 'Value of Time and Vehicle Operating Costs, TAG Unit 3.5.6, October 2013, Draft) .

A key reference in the ITS report is the SPURT study: 'Productive Use of Rail Travel Time and the Valuation of Travel Time Savings for Rail Business Travellers', Mott MacDonald , 2009. The ITS reports states:

'SPURT (Mott MacDonald et al., 2009) reported that around 80% of rail business travellers in Spring 2008 were now working during a train journey, with 82% working on the outward leg and 77% on the return journey. This is contrasted with an estimate of 52% from what they term the "last comparable data set" of the National Passenger Survey (NPS) of 2004, and is facilitated by more power points on trains and more Wi-Fi connectivity. This was over a period of only 3½ years and is therefore a large increase. Although not undertaken on a comparable basis, since the NPS did not reveal the actual amount of time spent working, it was estimated that 30% of journey time was spent working in 2004 increasing to reported levels of 57% in 2008.'

The rate of increase in working on the train strongly indicates that by the time HS2 is in operation, business passengers will be working most of the time on the train, let alone by the end of a further 60 years. The evidence from the ITS report indicates that there is little difference in effectiveness of work done on the train and in the time saved off the train. So it follows that the possible reason that the passenger and/or his/her employer might value the time saved more than that valued by leisure passengers is not because more work is done or that there is more leisure time. This brings into question as to why any such 'added value' should be given and, indeed whether it is or will be when/if HS2 starts operating.

The evidence that 'added value' has applied in the past is given in the work reviewed by the IST. Much of the work is quite old, particularly the UK 'Revealed Preference' studies , which give values of time saved around that now adopted in the DfT guidance (draft WebTag 2013),

going back to the 1980s. The more prevalent UK 'Stated Preference' studies give values lower than that in the draft WebTag 2013 (about 22 in Table 3.6, p 50). The ITS reports speculate on what might be the reason for the difference:

'Stated Preference (SP) values could be lower than Revealed Preference values because the full company effect has not been taken into account. This might be because of ignorance or else a personal preference to avoid time savings if that would mean work would have to be done elsewhere or overtime payments were reduced. An offsetting effect would be that travel time saved converted to personal leisure time might exert an upwards influence.'

This speculation appears to be contradicted by another study reported in the ITS study, namely: 'Accent Marketing and Research, Hague Consulting Group and Steer Davies Gleave (1989) InterCity Business Travel Price Elasticity Research. Prepared for InterCity Marketing Planning Manager, British Railways Board.' The ITS report says 'Two computer-assisted SP exercises were then conducted with business travellers (as opposed to those responsible for company policy and travel arrangements). The first SP exercise (SP1) offered pairwise choices between two options characterised by ticket type, ticket price and journey time. The second SP exercise (SP2) then offered pairwise choices between rail and other modes of travel but in addition to the discussion of travel policy issues (which had not preceded the first SP exercise but did precede the second SP exercise), respondents were now also reminded of business travel policies in the instructions regarding the second SP exercise. This was termed the 'company policy overlay' and had a clear impact as is apparent below. As can be seen from Table 3.14, in all but one case the SP values were lower when there was a greater incentive to account for company policy.' The SP2 value corresponding to the SP1 value closest to the WebTag guidance is £13.8.

The ITS speculation above therefore implies that company policy would drive the value upward whilst the Accent result indicates that it is driven downward. One could further speculate that the difference is due to different company policies and/or different extents to which employees follow them. It seems outdated to consider the company policy having more weight than the employees' policy in determining what actually happens, particularly if the latter is more prudent or cost conscious. For example, it could be that a company policy is to allow a middle manager to travel first class and/or stay in a three star hotel when the manager would not do so because the money comes out of his/her budget and he/she would rather spend it more productively in pursuing his/her part of the business. It may be that greater flexibility and delegation of responsibility in the UK contributes to the reason that more recent UK SP studies give lower values than older RP values, while on the continent the two are more similar. For such reasons it is considered wrong at this time to bias the point value used away from the SP and to take these values to be outside the range of the sensitivity analysis.

Changes in working practices of the above kind could be the cause of observed decrease in SP observed with time. For example, Table 3.8, p 51 of the ITS report gives SP values of 25.6 and 17.3 for pre year 2000 and post year 2000 respectively and a RP figure for pre year 2000 only. However, ITS refer to differences in conditions corresponding to these SP values, namely: 'The earlier time period has a mean distance of 91 kilometres with 52% (59%) rail used (valued) and 24% (24%) car used (valued). The more recent time period has a mean distance of 74 kilometres with 24% (32%) rail used (valued) and 52% (47%) car used (valued). On the basis of the preceding results, we would expect some tendency for values to fall.' ITS then conducts a very briefly described regression analysis which results in the conclusion that analysis 'does not point to trend reductions in valuations over time.' Given the above reasoning, it is also considered wrong at this time to exclude an observed trend from

estimation of the point value and range for sensitivity analyses on the basis of an inscrutable (in the report) regression analysis. (see comments on the regression analysis in the KPMG report on regional impacts of HS2)

This view is also reinforced by the results of Hensher studies which are summarised in Figure 1 of WebTag 2013 as 15 ± 10 . The Hensher approach seeks to modify the cost savings approach by allowing for various factors which might reasonably be expected to affect the value. The ITS report states (p15) that 'the main reservations concerning this approach have been the degree of accuracy with which its key parameters can be estimated and whether it does indeed provide an accurate account of the benefit to companies of time saved travelling by their employees as might be reflected in the company's willingness to pay.' However, there has been a trend towards buying cheaper tickets, indicating less willingness to pay full price tickets. As stated in Para 1.2.16 of the October 2013 Case, 'analysis of other data sources such as the National Passenger Survey (NPS) has shown that while the journey purpose mix has remained stable since the NRTS was undertaken, the relationship between ticket type and journey purpose has changed, in part due to the greater availability of discounted tickets.' Given this trend, downward value indicators in SP studies, greater delegation of expenditure decisions and DfT's own recent 32% reduction in the value of time-saved by business passengers, it is likely the latter will fall towards values estimated using the Hensher approach, which differs from the cost savings approach in that it combines the perspectives of the employer and the employee. This is more in line with modern business practice and will be more so in the future.

Conclusion: The point value for the value of business passenger time savings, and its range for sensitivity analysis, in the October 2013 Economic Case, have not been justified. The point value is likely to have been substantially overestimated, particularly at the planned start of operations of HS2 and during the 60 year appraisal period.

Further, there is a conceptual anomaly associated with the use of a Willingness to Pay approach to estimate a Transport User Benefit. In the Case of a Cost Based Approach, as used in the October 2013 Case, it can be appreciated how a non-monetary quantity (ie time-saved) is a benefit to the transport user, with a value of time-saved used to give a monetary value to it. (eg to give, using his/her wage, the amount of extra work he/she can do). However, in the case of Willingness to Pay which is expressing the money the traveller or his/her business is willing to pay extra for the time-saving, it is incongruous to represent this as a user benefit rather than the extra fare that they *would* pay. This is a distinction between estimating a benefit with no direct value judgement (ie as in the Cost Based Approach) and making a direct value judgement by saying how much extra fare one is prepared to pay. Put another way, why should this not be put directly into the BCR calculation as additional *revenue* rather than converting it into a user benefit with a debatable conversion factor, namely the value of time saved. If the £21B of business traveller time-saving benefit corresponding to the £26 per hour excess in value of time-saved by business passengers over that of leisure passengers in the October 2013 Economic Case, were moved to the revenue line, it would be inconceivable for business passengers to be willing to pay the increased fares that would be required to generate the resulting revenue.

Indeed there are indications that they would not be willing to pay anything more than the leisure value of time-saved (or in fact that leisure passengers value the time-saved). For example, the Eurostar fares from London to Paris may be compared with those of a journey of similar distance on the WCML, London to Carlisle in Cumbria, though the latter could be about 20 miles greater.

For trains departing from London at about 7am, the Eurostar standard semi-flexible return fare (£309) is about 93% of the approximately equivalent Anytime return WCML fare (£332). The Eurostar Standard Premier semi-flexible return fare (£390) is about 85% of the approximately equivalent First Anytime return WCML fare (£458). It is considered that the punitive fees (£30 per leg) on Eurostar for exchanges and refunds would not be tolerated on HS2 considering the Virgin current charge of £10 per booking. However, even including the Eurostar fee for both legs, the Eurostar Standard Premier fare is still only 96% of the WCML First Anytime fare including the Virgin charge. Even the fare for the top fully flexible Business Premier Class on Eurostar (£490) with business lounges, three course gourmet meals, fast check-in and no additional exchange or refund fee is only 4.7% higher than the First Anytime fare on WCML including the refund charge.

Consequently the fares, for an equivalent level of service, are less on Eurostar than on the WCML, in spite of the time saved of about 1 hour by Eurostar on these journeys of similar distance (journey times are 2 hrs 16mins to Paris and 3 hours 16 mins to Carlisle). This indication of the inability of Eurostar to attract higher fares is also reinforced by the apparently low return on the original investment (see, for example, the website of the independent think-tank, the Institute of Economic Affairs)

Conclusion: Business passengers would be unwilling to pay the increase in fares corresponding to the value of business time savings used in the October 2013 Economic Case. This reinforces the view that the value of business time saved in the October 2013 Economic Case, although reduced by 32% from the August 2012 case, is still greatly overestimated for the present, and even more so if/when HS2 is in operation. Indeed this reduction by the DfT represents, in itself, a downward trend in the value considered to be applicable, as does the concurrent HS2 Ltd increase in the proportion of passengers taken to be business passengers in the October 2013 Economic Case, owing to the previous association of ticket types with passenger types failing to 'keep pace with changes in ticket purchasing habits.'

Appendix 3 Results of Assessment of Impact on Culcheth Businesses of Closure of Wilton Lane for Bridge Works

Assessment of the Impact on Culcheth Businesses of Closure of Wilton Lane for Bridge Works

In Autumn 2012, Wilton Lane, the road from Culcheth to Lowton, was closed for bridge repairs. This closure lasted for approximately four months, with a break over the Christmas and New Year holidays. The closure was close to the site proposed for the HS2 bridge on the same road.

The impact on the local businesses was significant.

This assessment provides data on this impact obtained by discussions with local businesses and relates this to the impact of long term road closures which could arise if the HS2 Golborne Connection was built, since this would require three roads to have bridges constructed.

Culcheth has a thriving local centre. A feature of this is the approximately 70 small businesses in the centre of the village. Many of these have a retail or similar nature, such as shops, restaurants, personal and professional services, etc. Many of these have reported that trade was significantly affected by the road closures in 2012/13. This survey seeks to quantify this.

A questionnaire was used to seek information on the impact of the closure on each business. Not all the businesses were still in operation, some having closed down, and others had started up or changed hands since the period in question, but in total data was obtained from 46 businesses. Data was sought on the impact at the time of closure, any residual impact a year later, and also on the size of the business, measured by numbers of employees.

The results were as follows:

	Number of Businesses	Loss of Trade	Range of losses	Total jobs	Total FTE*	Jobs at Risk	FTE* at Risk
Overall Totals	46	19.7%		339	215	68	42
Shops	23	21%	10% – 50%	88	52.4	19	11.8
Pubs and Restaurants	5	27%	10% - 50%	88	54.6	23.5	14.6
Professional Services	10	3%	0 – 15%	47	33.75	1.7	1.0

*FTE = Full Time Equivalent

The overall total includes all 46 responses (including estimates in the case of two businesses for which data on the actual reduction in business experienced was not available). Breakdowns have been listed for three categories where there were sufficient businesses in the category to give a meaningful figure.

From this it can be seen that the closure resulted in a drop in the level of business of 19.7% which, if prolonged, would threaten 68 jobs equivalent to 42 full time employees.

Since this is based on data for only 46 of the 70 or so businesses in the village, it is likely the actual impact would be higher.

This relates to the construction of the HS2 Golborne connection since for this, three main roads into the village require bridges to be constructed. If these were constructed sequentially, there would be traffic disruption similar to that in 2012/13 over a very long period of time. If two or all three were constructed at the same time, the village would be cut off and many businesses would close.