

As the Government push ahead with building a High Speed Rail network it is worth looking to see if there is any current evidence to support their assertion that we will want to travel much more frequently between our major cities in the coming years.

The DfT and HS2 analysis and information is not that transparent. However the recent HS2 Ltd analysis is being carried out by the consultant MVA who were also the consultants to the HSR lobbyists, Greengauge 21, when they prepared their 2009 report “Fast Forward a High speed rail strategy for Britain” which provides the framework that the Government are following. MVA give a clearer view of the total system envisaged which is summarised in terms of assumed future passenger journeys in Table 1. The table shows the build up of passengers envisaged for each additional section of line and the transport mode that the passengers are expected to come from

Table1 Data Source Greengauge 21 Fast Forward a High speed rail strategy for Britain” Prepared by Systra/MVA 2009	Total HS demand (million) (2055)	Abstracted from classic rail (million) (2055)	Abstracted from air (million) (2055)	Abstracted from car (million) (2055)	Generated HSR users (million) (2055)
London/Heathrow/HS-CT to Birmingham/Manchester	72	48	8.2	2.9	11.8
London/HS-CT to Sheffield/Leed	51.6	36.5	3.4	2.6	9.2
HS-NW extended to Scotland	28.8	9.5	15.6	2.1	1.6
HS-NE to Newcastle	37.5	24.3	2.4	4.7	6
Value of Heathrow link	10.1	1.8	4.9	0.8	2.7
Total	200	120.1	34.5	13.1	31.3

Source data, Greengauge 21 www.greengauge21.net/publications/fast-forward-a-high-speed-rail-strategy-for-britain/ Table, Bluespace Thinking Ltd

All these assumptions are important but the economic case for HSR is particularly dependant on additional HSR passengers attracted from other modes because they bring additional rail fare revenue which is what has to pay for the additional rail investment and operating cost of two network systems.

We have found no way to validate the 31.3 million/year generated passengers. Apparently it is assumed that because HSR is faster these passengers will decide to take a costly long distance train journey that they would not otherwise have taken by any other mode.

We have been able to research the 34.5 million/year passengers assumed to transfer from air. These passengers are particularly important not just for the economic case but also because it is these transfers that are assumed to reduce emissions to offset the additional emissions that come from higher speed rail travel.

Civil Aviation Authority statistics show that in 2010 there were just 7.7 million air passenger journeys between the areas served by the HSR overall plans. These would need to increase by a factor of 4.5 to reach the 34.5 million journeys in 2055 assumed by MVA. Also all relevant passenger would need to transfer resulting in no flights between these destinations.

Table 2 shows the routes of these journeys and how over the last few years they have declined.

Table 2

	2003	2004	2005	2006	2007	2008	2009	2010 [1]	2011 [1]	% change since 2003
UK Air journeys to HSR destinations between	1.69	11.84	11.98	11.41	10.89	9.89	8.56	7.67	[2]	-34.4%
Central Scotland to/from London/SE area	7.04	7.02	6.92	6.59	6.6	6.09	5.63	5.19	[2]	-26.3%
North East to/from London/SE area	0.94	0.98	1.23	1.17	1.02	0.87	0.74	0.64	[2]	-31.6%
North West to/from London/SE area	2.02	2.17	2.09	1.95	1.59	1.36	1.22	1.05	[2]	-48.1%
West Midlands to/from Central Scotland	0.73	0.73	0.8	0.82	0.79	0.75	0.62	0.52	[2]	-29.5%
UK Air journeys between all other HSR destination	0.96	0.93	0.96	0.88	0.88	0.82	0.35	0.27	[2]	-71.7%
Total UK Air journeys between HSR destinations	1.69	11.84	11.98	11.41	10.89	9.89	8.56	7.67	[2]	-34.4%
Annual % increase/ - decline in air journeys		1.23%	1.24%	-4.80%	-4.53%	-9.18%	-13.42%	-10.42%	[2]	
UK GDP % annual increase/ - decrease (real terms)		2.95%	2.17%	2.79%	2.68%	-0.70%	-4.87%	1.25%	[2]	6.2%

Notes:-

1. Comparison between 2009, 2010 & 2011 will be impacted by the 2010 Iceland volcano eruption
2. Full year 2011 data will be available from CAA March 2011, the latest provisional data up to Nov 11 suggests a continuing underlying downward tr

Current Government and public air industry analysis did not predicted this decline. It has occurred during a period of air fares decreasing in real terms. It is generally being attributed to the economic situation however between 2003 and 2008 these air journeys decreased by 16% while the economy increased by 10%. We will be preparing a paper that explains why we think the latest (Aug 2011) DfT domestic air forecasts significantly overstate the growth on these routes.

The 34.5 million growth figure predicted by MVA in 2009 seems very unlikely to occur, however without this growth the economic case crumbles and any suggestion that HSR is emission neutral become unjustifiable.

We are unable to carry out the detailed analysis required to validate the 13.1 million journeys assumed by MVA to transfer from car as a result of an HSR system so we can take no view on whether this is realistic.

To assess the assumption that 120.1 million passengers will transfer from the classic rail system we have looked at the current rail journeys between the relevant Government regions as reported by the Office of the Rail Regulator. We have focussed on the longest journeys where the MVA methodology predicts the greatest growth will occur. The top part of Table 3 shows the rail journeys between regions as reported by ORR the lower part shows the total journeys when CAA Air and ORR rail journey are combined.

Table 3

UK Rail journeys between regions					Note [2]	Note [2]	Note [2]		
To/From	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	% change since 2003-04
LONDON - NORTH EAST - Rail	1.66	1.73	1.74	1.78	1.89	1.93	1.94	[1]	16.7%
LONDON - SCOTLAND Rail	1.16	1.07	1.11	1.24	1.36	1.47	1.66	[1]	43.4%
LONDON - NORTH WEST - Rail	4.90	4.62	5.47	6.03	6.45	6.58	8.01	[1]	63.5%
WEST MIDLANDS - SCOTLAND Rail	0.18	0.18	0.19	0.20	0.20	0.21	0.29	[1]	59.4%
UK Rail journeys between regions + air journeys to HSR areas									
Scotland Rail + Air	8.19	8.09	8.02	7.83	7.97	7.56	7.29		-11.1%
London to/from NE Rail + Air	3.68	3.90	3.82	3.73	3.49	3.29	3.16		-14.1%
London to/from NW Rail + Air	6.92	6.79	7.55	7.98	8.05	7.94	9.24		33.5%
West Midlands Scotland Rail + Air	0.92	0.9	0.98	1.02	0.99	0.96	0.92		-0.2%

Notes:-

1. ORR Statistics for 2010 – 11 have not yet been published and ORR do not have a planned date to publish the data.
2. ORR have reported changes in treatment of PTE ticket data since 2007 and recommend caution particularly if trending data. 2009 - 10 growth for the North West looks particularly high.

Source ORR Regional Trends tables 2010/11 Trends year book www.rail-reg.gov.uk/server/show/nav.2026
Table, Bluespace Thinking Ltd

There has clearly been significant rail growth over the last 6 years although ORR suggest caution in using the data because of changes in methodology related to PTE tickets. Much of the growth has almost certainly come as a result of the significant improvements on the West Coast Mail Line services taking passengers away from air and road. The second part of Table 3 shows however that overall rail and air journeys have declined on three of the four longest distance routes with only journeys between London and the North West growing, this maybe real or maybe as a result of the changed methodology. The huge 22% growth 2008/9 to 2009/10 in rail journeys between the North West and London has not occurred in NW journeys to other regions.

As in the case of air alone the decline in the Scottish and NE routes has occurred while GDP has increased by about 10%. Given the current level of rail journeys to Scotland and the North East from other regions and that past growth on the longer distances has come from transfers from air it is difficult to see that the underlying growth in classic rail will reach the figures indicated. As an example the 24.3 million classic rail journeys to from the North East would mean a 5.5 times increase in the number of rail journeys, that can be served by the proposed extension.

For the longer distance extensions the MVA numbers appear totally unrealistic given the current level of growth. From previous work we consider that for the London to West Midlands section the HS2 Ltd passenger figures are over estimated by about 35%. This is a similar figure to that calculated by Parish and Castle in their Nov 2011 report “Review of the economic case for HS2”. www.telegraph.co.uk/news/uknews/road-and-rail-transport/8933742/8.5-billion-black-hole-from-HS2-high-speed-rail-link-report.html

This level of reduction in passengers, benefits and fare revenue reduces the Benefit Cost Ratio of the first phase to about 0.7, the total anticipated economic and societal benefits of the project being significantly less than the cost.

We have established that the reason the Government and possibly MVA have overestimated the underlying classic rail growth is due to guidance given in Webtag unit 3.15.4 & PDFH version 4.1 www.dft.gov.uk/webtag/documents/expert/unit3.15.4.php that includes growth elasticities to GDP that increase as journeys get longer. Although they recommend carrying out sensitivities with lower elasticities this has not been done by MVA or HS2 Ltd. DfT have a revised version of Unit 3.15.4 www.dft.gov.uk/webtag/documents/expert/unit3.5.14c.php that did explain why the original recommendations were flawed and noted that they produced unrealistic result. This document was revised by the DfT in November 2011 removing these references. However the 2007 report (again by MVA) that assessed the guidance and made the recommendations for changes is still referenced on the DfT web site although the link to the report appears broken, <http://webarchive.nationalarchives.gov.uk/+http://www.dft.gov.uk/pgr/rail/researchtech/research/railpassdemandforeresearch/>

These documents are important because they explain that the basic premise of UK HSR is that demand for long distance rail journeys is growing faster than other journeys. This view is based on data that is 14 years old Webtag Unit 3.15.4 para 5.1.4 page 5 quote :- “PDFH exogenous background elasticities have been calibrated on regional data for the period 1990-1998 i.e. financial years 1990/91 to 1998/99”. The academics that originally made the recommendations have, we believe, since revised their views. In an FOI response from the DfT in 2010 we have been advised that the recommended changes had not been made because the Secretary of State had not approved them.

Based on ORR data from 1995 to 2010 it is now manifestly clear, to those that are willing to look, that this assumption is no longer valid. Using ORR data of rail journeys between regions we have looked at the correlation between distance of journey and rate of growth this shows a very strong (R2 -0.9) inverse correlation, that is, the longer the journey distance the less the growth, the complete reverse of the guidance premise. The long distance elasticities are therefore considerably over stated resulting in forecasts of extreme overall journey growth that are not supported by recent evidence.

In summary the Government have decided to progress their (or Greengauge 21s) HSR plans based on assumptions and analysis that is no longer valid and is not supported by the events of the last 15 years. The National Travel Survey shows that total domestic travel has remained constant at about 7000 miles/year for the last 15 years and the number of long distance journey remains at about 7 / year/person. For HSR in its current proposed form to be economic it requires an estimated 4 to 5 fold increase in passenger numbers over the next 40 years when the population is predicted to increase by about 30%. The existing rail network can be improved at a fraction of the cost and a lot quicker than a totally new HSR system to provide sufficient capacity to meet demand and to reduce journey times, continuing, more quickly, the recent transfer of passengers from air to rail.

Malcolm Griffiths
Bluespace Thinking Ltd

We have taken care to make sure this paper is accurate, as in any complex area of work, commenting on others assessment, there is scope for mis-interpretation and error, if you consider we have made any such errors please advise via the Bluespace Thinking website www.bluespacethinking.com/