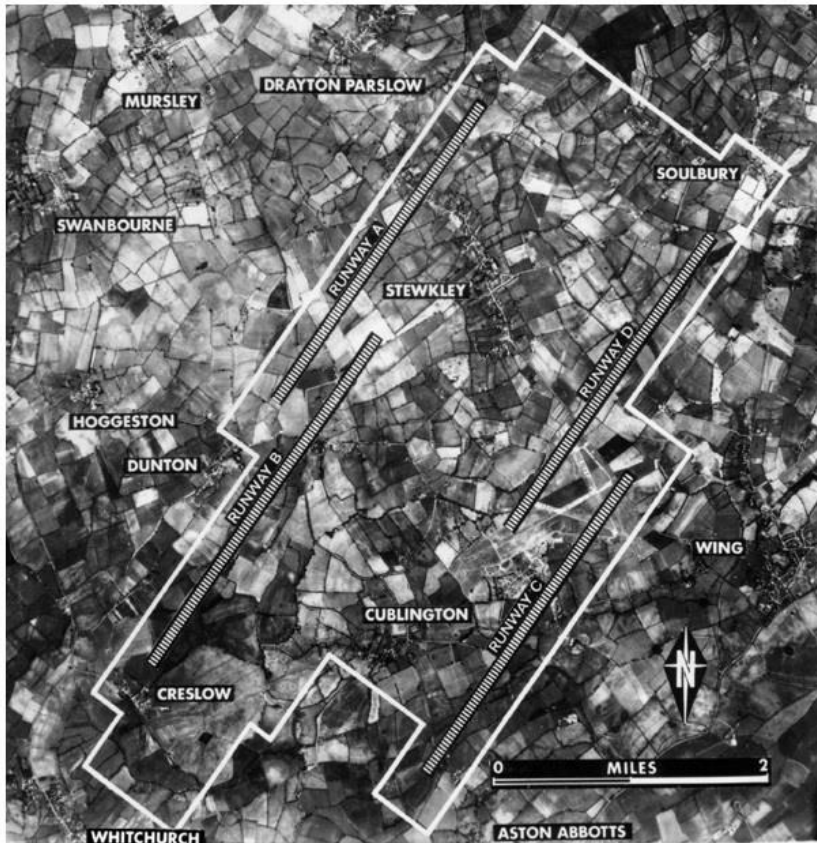


Nonsense on Stilts? – The Economic Analysis of HS2

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This title of this blog is based upon is upon Peter Self's critical book on Cost-Benefit Analysis (CBA), *Nonsense on Stilts: Econocrats and the Policy Process*, that heavily criticised the use of the technique in the proceedings of the Roskill Commission examining the proposed site for a third London Airport^[1]. In his career, Self rejected economic rationalism, whose dogmatic proponents in public policy he called 'econocrats'. As Self observed of the Roskill proceedings

The spectacle of the flower of the English planning bar gargling gingerly and reverently with the cost-benefit figures, including more than a day spent by the Commission's own counsel upon explaining, a bit pontifically and dogmatically, the relevant methodology. [1]



Following Roskill, the use of CBA in public hearings has been dogged by controversy since. The Heathrow Terminal 5 public enquiry cost £80m and lasted nearly four years for a project whose total cost was £4.2bn. Since then the UK Government's *The Green Book: appraisal and evaluation in central government* of 2003 that has been periodically updated since sets out its approach to public investment projects. Although CBA is the central evaluation methodology it is supplemented by guidance for a number of public policy areas.

A more comprehensive name for assessing the proposed high-speed rail link (HS2) to be built initially between London and Birmingham (Phase 1) and then on to cities in the north of England (Phase 2) could be Crazy Train? This is the title of the recent blog by Dr Steven McCabe of the Centre for Brexit Studies at Birmingham City University.



HS2 was announced in 2009 in what appeared to be the logical extension of High Speed 1, the route between St Pancras International Station and the Channel Tunnel. Initial costs were estimated to be £37.5bn (2009 prices) with Phase 1 to be built by 2026. Since the publication of the economic case in 2011, official cost estimates have increased from £42bn to the £88bn forecast of the Oaktree Review in 2019. The independent Berkeley Review estimates that costs will be £106bn (all in 2020 prices). One assessment put the final cost to be in the order of £157bn if the costs of improved local and regional connections to H2 hubs is added in.

Cost overruns are not just a feature of HS2 as the internationally comparative database of major transport infrastructure projects (over \$100m), created by Bent Flyvbjerg and colleagues at the University of Aalborg, shows. Their results state that;

- average cost overruns of 45% for rail projects, whilst for twenty five projects studied, actual traffic outcomes were 52% less than forecast.

Similarly, the Benefit-Cost Ratios (BCR) claimed for large infrastructure projects tend to go south as costs go north. The estimates of BCR for HS2 are returned to below.

It would appear that optimism bias tends to reinforce J.K. Galbraith's observation that:

“the only function of economic forecasting is to make astrology look respectable”

The Seduction of High-Speed Rail

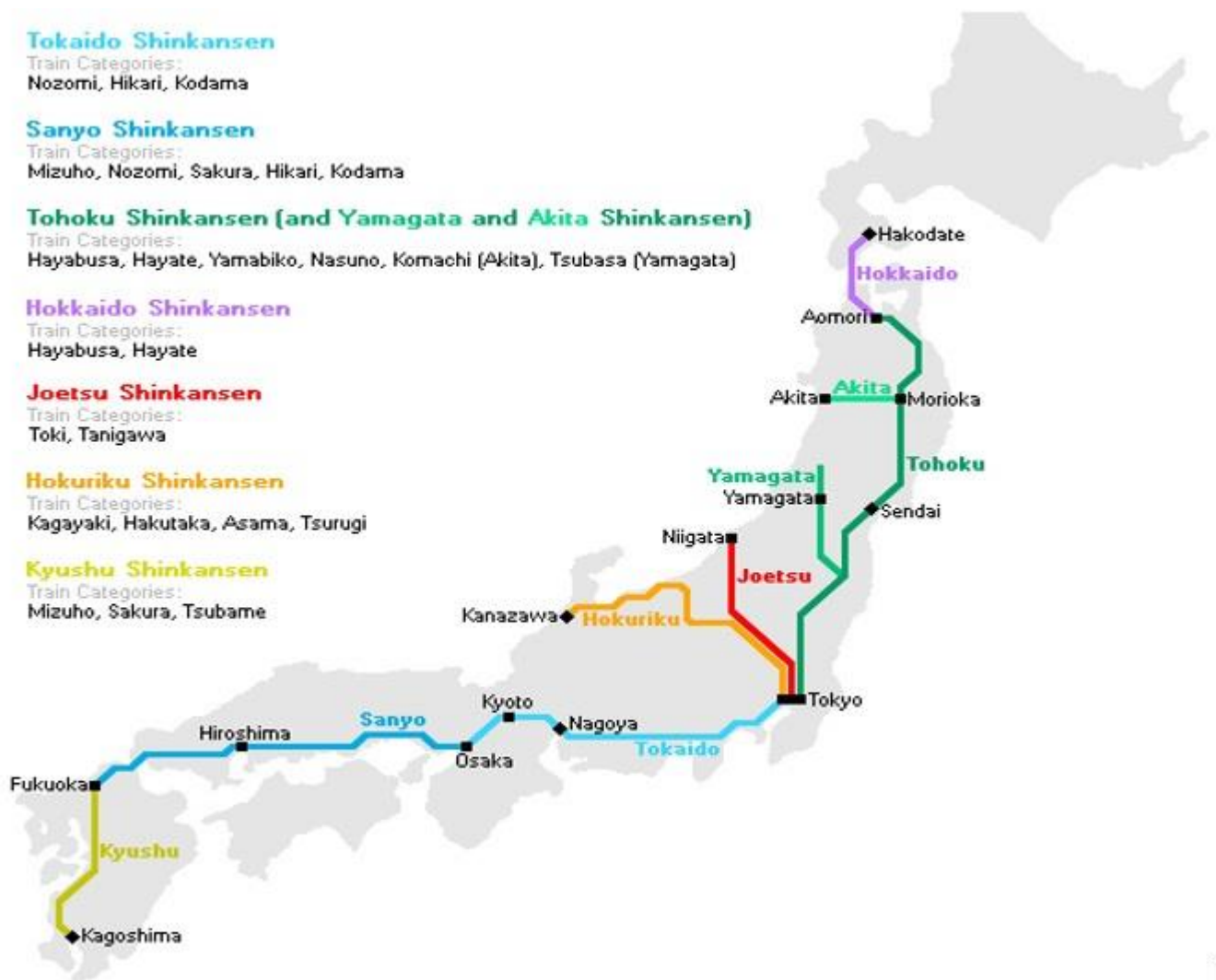


I can personally attest to the joys of travelling on a *Nozomi* Shinkansen bullet train in Japan. The bullet train system has grown over time from its inauguration in 1964 with various milestones since. In 1997, the *Akita* and *Nagano* mini Shinkansen, run on existing narrow gauge tracks, was opened. The Shinkansen

system is characterised by being a network in which connectivity between major cities is key but its growth has been at the cost of lower levels of regional train routes.

There are five other countries worldwide (apart from the UK) where high speed rail lines have received a significant amount of investment: France, Germany, Spain and, more recently, Italy and China. These examples have been used by the UK Department for Transport to justify HS2 based upon the apparent unalloyed joys of high-speed travel. But as John Tomaney of UCL pointed out in his evidence to the House of Lords Economic Affairs Committee in 2011:

It is very difficult to substantiate the argument that high speed rail is likely to have a positive impact on regional inequalities. Cities which are the location of HSR stations may gain some benefits, but distribution of net benefits needs careful analysis. Some the benefits accruing to regional cities may be at the expense of neighbouring cities, while in countries with dominant capital cities net benefits tend to accrue to these[\[2\]](#).



In France, the *Train à Grande Vitesse (TGV)* network accounts for about 37% of the rail system but much of it runs on conventional tracks. Intermediate stations and safety regulations also reduce the scope for achieving the maximum speeds of 320km/hr. There is also increasing public opposition to the building of new TGV lines[3]

The regional balancing arguments for high speed rail are similarly conflicting and contradictory with growing evidence that investment in the regional hinterlands of cities' travel-to-work areas generate larger benefits than between cities. With regard to the impact of high-speed rail on regional development in the EU, under *Trans-European Networks for Transport (TEN-T)* programme, the transport economist Roger Vickerman notes:

But what is clear is that the development of HSR has not led to the reduction in inequalities in accessibility and any associated economic

consequences claimed for in EU policies. Thus, it is not distance, which is the major obstacle, but rather the cross-border nature of the problem facing intermediate regions. New infrastructure and new types of service do not seem to have been able to effect change^[4].

Shifting Share of HS2 Objectives

Shift-Share Analysis is a standard regional analysis method that attempts to determine how much of regional job growth can be attributed to national trends and how much is due to unique regional factors. It can be considered metaphorical to the changing objectives of building HS2 whose potential achievements tend to be covered by aggregate Benefit-Cost Ratios (BCRs) that are reified as some objective function:

- *Speed:* The speed benefits tend to be more significant for HS2 Phase 2 than journey times for Phase 1. The current fastest rail journey between London and Birmingham is 82 minutes, forecast to be reduced to 52 minutes with the introduction of HS2. But this is not a like for like comparison with current fastest train stopping at two intermediate stops on conventional tracks.

The HS2 trains are also unlikely to reach their maximum speed during much of the 140-mile route due to acceleration and deceleration, as well as signalling and safety constraints.

Travel time savings are a major benefit claimed for HS2 based upon the average wage rate for business travel. Leisure time saving equates to 0.5 to 0.25 of average wage rate depending upon mode of transport. But, the underlying false assumption for HS2 business travel is that people do not work on trains, thereby increasing the claimed benefits of time savings significantly.

- *West Coast Main Line capacity:* The capacity issue is a canard arising from the flawed and now defunct rail franchising system. The journalist, author, and railway historian, Christian Wolmar, estimates that actual West Coast Main Line capacity is 52% for long distance evening trains from London Euston but is distorted by pricing system of the privatised system. The House of Lords Economic Affairs Committee's *Rethinking High Speed 2* Report sets out the following Table showing the percentage of

passengers standing in peak hours on a typical autumn weekday by city in 2017:

| City | Train operator | AM peak arrivals | PM peak arrivals |
|----------------------|---------------------------------|------------------|------------------|
| Birmingham | <i>Virgin Trains West Coast</i> | 3% | 5% |
| London Euston | <i>Virgin Trains West Coast</i> | 2% | 2% |
| Manchester | <i>Virgin Trains West Coast</i> | 4% | 1% |

- *Birmingham International Airport solving the Heathrow problem:* Some have argued rather than building a third runway at London Heathrow Airport, a direct link should be built between both airports. This is line with the extension of high-speed rail between airports in other European countries, so as to create wider inter-modal benefits.

I never have understood, however, why regional and urban policy in the UK always seems to be dominated by Heathrow Airport when London and the South-East has a potential network of six airports, but like rail franchising system the pricing and regulation of airports reduces network benefits. Directly linking Birmingham International Airport effectively makes it London's 7th airport, relegating any Global Birmingham ambition, post-Brexit. It would also mean a change in the allocation of landing slots across the whole UK airport system based upon some hierarchical ordering, that appears very unlikely to happen.



Shift London's employment share: It has been argued in some quarters that because of London's higher cost base, HS2 will attract relocation of business and financial services (particularly back-office) employment from London to Birmingham as well as promote reverse commuting. In regard to the latter the Alonso model (named after the urban economist, William Alonso) may provide some insights. In this model, households' locational decisions are a function of a trade-off between housing costs and transport costs. The former decrease further away from a city centre whilst the latter increase. Transport improvements can lower costs (equivalent to time savings in HS2) so that commuters can gain lower housing costs further from urban centres.

This might apply in principle but the onset of the Covid-19 pandemic may have profound impacts on the spatial structure of urban agglomerations and their employment characteristics in future. Moreover, Brexit has already led to a shifting of back office functions to other European cities away from London. Given the expected completion date of Phase 1 moving out to 2028-31 and Phase 2 to 2035-40, this potential outcome seems improbable.

The Moving Feast of BCRs as the objective function of HS2

The objectives of HS2 now seems to have moved on to the fallacy of the sunk costs argument. By September 2019, £7.5bn had been spent on HS2 yet using this as a justification for the continuance of the project is a classic case of pouring good money after bad. Benefit-Cost Ratios have fallen from the original estimates of 2.4 to 1.4 (£2.40 to £1.40 of benefits for every £1 spent) currently, according to HS2 Ltd; 0.66 in the alternative Berkley Review; and, now possibly approaching zero in the view of Christian Wolmar. The essential problem is that the promotion of BCRs by policy makers to assess large infrastructure projects takes us back to Self's 'econocrats' territory.

Both House of Lords Economic Affairs Committee reports *Economic of High Speed 2* (2015) and *Rethinking High Speed 2* (2019) raise doubts about the capacity and BCR numbers. The latter report welcomes the shift in funding for Phase 2 towards Northern Powerhouse Rail Partnership but latest estimates for completion of this phase is now 2035-40.

The essential issue is that railway investment generates network and connectivity benefits rather like the economics of the Internet. HS2 is a very expensive single line whose main beneficiaries seem to be the large property companies, accountancy firms, management and engineering consultants, and construction firms.

I have no personal objection to my friends in the West Midlands gaining economic rents from associated increased house prices as I personally have benefitted in London due to public policy. But this is hardly a rational basis for using rail investment to boost regional policy.

The industrial and socio-economic structure of the West Midlands, based upon automotive and associated services, is increasingly threatened by the impact of Brexit (especially No Deal). Regional policy makers need to go back to the Eddington review of transport policy of 2006 to formulate their underlying transport strategy:

Step-change measures intended to transform the economy are not, in a world of constrained resources, likely to be a priority. The available

evidence for step-change projects in the UK, such as a new high-speed North-South rail line, shows wider BCRs [benefit-cost ratios] at the lower end of the distribution before accounting for landscape and carbon effects. Furthermore, BCRs of alternative options to solve these problems are not available. However, it is often argued that such measures miss transformational economic impacts, such as a radical shift in the economic geography of the UK brought about by new levels of connectivity. The evidence for transformational benefits is at best unproven, and ... the UK's urban areas and regions are already well connected[\[5\]](#).

Is there a concluding end game?

In terms of rebalancing the West Midlands region, the post-Covid environment is the £64bn challenge but it does provide an opportunity for exploring greater devolution, regionalised industrial policy, a changing spatial structure and a transport network appropriate to the socio-economic needs of the citizens of the region. Developing a regional resilience in managing the ongoing shocks of Brexit and building the capacities and capabilities to meet global ambitions should be primary. In this regard, again, a return to Eddington who stresses the importance of urban transport systems is very relevant:

Given that agglomerations in a service-based economy tend to be found in major urban areas; that urban networks are particularly heavily used and shared by a wide range of users; and that economic growth and congestion are disproportionately represented in urban areas, projects in urban areas might have been expected to offer very high returns. It is not unreasonable, at the strategic level, to consider that the costs of congestion and unreliability are likely to have a far greater direct impact on the economic success of the UK than might be the case for some other parts of the transport system”

This may include faster speed connectivity to the other metropolitan regions of the UK, outside London, in the future. But these outcomes should not be determined in London to the benefit of London: a key conclusion of the two House of Lords reports that the capital gains most agglomeration benefits from HS2. As Andrew Peddleton of the New Economic Foundation observes:

HS2 is a product of decision-making that begins and ends in London. It's no surprise that with this approach we've ended up with a railway project that looks like a solution in search of a problem.

The counterfactual that needs to be asked is whether in the face of the double whammy of Brexit and Covid, the opportunity costs of HS2 may ultimately be too large for the region. The transactions costs may be also significant for the railway industry and UK transport in general in the event of a limited or No Brexit Deal, leading to much greater operational costs, lower accessibility and connectivity.

As for the Global Birmingham ambition, in my view HS2 just turns Birmingham into a suburban commuting town of London that I'm sure is not purpose for levelling up rather than down in a post-Brexit Britain in the UK's second city.

[1] The Roskill Commission was established in 1967 to evaluate and decide upon the site of the Third London Airport that sat from 1968 to 1970. The research report was published in 1971 at a total cost of £500000 that is £62m in today's terms

[2] See: Tomaney, J. (2011) *The Local and Regional Impacts of High Speed Rail in the UK: A Review of the Evidence*, written evidence to the House of Lords Economic Affairs Committee inquiry into High Speed Rail

[3] See Vickerman, R. (2015) 'High-speed rail and regional development: the case of intermediate stations' *Journal of Transport Geography* 42, 157-165.

[4] See: https://www.french-property.com/news/travel_france/high-speed-tgv-rail-projects/print/#:~:text=Two%20new%20high%20speed%20rail%20projects%20are%20planned,speed%20TGV%20routes%20linking%20Bordeaux%2C%20Toulouse%20and%20Spain.

[5] See: <https://web.archive.org/web/20080324002356/http://www.dft.gov.uk/about/strategy/transportstrategy/eddingtonstudy>

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