

Commentary on HS2-HS1 link (Old Oak - Camden Road - High Speed 1 London tunnel)

Summary

1. A cross-London railway is proposed by HS2 Ltd from Old Oak interchange to join the High Speed 1 tunnel north of St Pancras. This is to allow international high speed passenger trains to run between the Midlands and North and mainland Europe. It would be built at the same time as HS2 Phase 1, because tunnelling would be required between Old Oak and Camden.
2. It would be only a single track tunnel and connection, and used by limited frequency trains. It has some design flaws, including operational interruption of the high frequency North London Line orbital services in the Camden area, and undesirable impacts on cross-London freight. Transport for London and other parties require its redesign.
3. As part of its redesign, Hammersmith & Fulham and other London boroughs seek a review of the railway's purpose, and consider that the real scope for HS2-HS1 is for a national and London region connector railway serving a variety of traffic flows, in addition to the international trains. This will also improve domestic links to the Midlands, the North and Scotland. While the link would cost more, there are more services which could use the railway and the scheme can therefore be better value for money.
4. Initial high-level analysis shows new flows could include:
 - Inter-regional services via Old Oak interchange.
 - Intra-regional services within London & Home Counties.
 - Relief for selected rail corridors within London.
 - A second London terminal at Old Oak (or through route) for Kent high speed trains.
5. Specific corridors could include:
 - Cambridge and North London via Great Northern Line.
 - Southend and northern Thames Gateway via c2c and HS1.
 - Kent via HS1.

Suggested next steps

6. HS2 Ltd, the Department for Transport and Transport for London should review the design of the HS2-HS1 link to make it fit for purpose for the Britain of 2030-2050. The capacity of different line sections should be confirmed, with use of existing and possible new rail junctions.
7. The commercial, capacity and business cases for new domestic services should be assessed for future timescales, recognising the scope for additional traffic via Old Oak and its interchange.

HS2-HS1 link – analysis

1. This case for this link is argued in HS2 Ltd documentation¹ on the narrow brief of a rail connection for international high speed trains between the Midlands and North and mainland Europe.
2. HS2 Ltd indicates that the cost of infrastructure would be approximately £900m. This would buy:
 - separate HS2-HS1 link platforms at Old Oak Central HS2 station.
 - a single track tunnel to Primrose Hill.
 - connections via Camden Road (on the North London Line) to the HS1 tunnel.
3. The Benefit Cost Ratio (BCR) is not high, and service frequency is limited: in the long term perhaps 3 through trains an hour each way from the Midlands and the North, according to HS2 Ltd's consultants, Arup. This frequency is comparable with flights from regional airports. Other international trains could also begin at Old Oak Central (or eventually at Heathrow). However, it is inevitable that most line capacity on the main HS2 route will focus on travel to and via London.
4. HS2-HS1 is worthy in aspiration, puts Old Oak Central on the international rail map and strengthens services through Stratford International. However it is difficult to avoid a conclusion that the current scheme is more akin to Section 40 in the 1987 Channel Tunnel Act – a lever to secure support from British regions for the main HS2 project.²
5. The specific design proposed for HS2 Ltd by Arup incurs:
 - serious disruption on a busy and high frequency orbital route, the North London Line, whose passenger numbers are increasing rapidly. (See TfL HLOS2 paper to the TfL Board's Rail & Underground Panel on 12 July 2011.³)
 - operating complexities for cross-London freight which is already a difficult logistical overlay on the North London Line and through Primrose Hill.
6. At the minimum, the HS2-HS1 link needs to be redesigned with separate track through the Camden area, to avoid unjustified and unsupportable pressures on the London's orbital passenger railways in the 2020s and beyond.
7. It is surely inconceivable that a nearly £1bn new cross-London railway would be justified and funded solely for international trains when these are, for practical purposes, capped in total frequency. Would it not be wiser instead to design in other beneficial flows that can underpin London's economy and wider regional economies, and offer new rail capacity in the agglomeration of London and the South East and accessibility via Old Oak to the Midlands, the North and Scotland?

¹ <http://s3-eu-west-1.amazonaws.com/assets.dft.gov.uk/hs2-hs1connection.pdf>

² Section 40 proposed regional services to mainland Europe, and led to construction of regional Eurostar and sleeper trains, but there was never a commercial case to operate them. The trains are now operated abroad.

³ <http://www.tfl.gov.uk/assets/downloads/corporate/Item05-RUP-12-July-2011-HLOS2-recommendations.pdf>

8. In the opinion of Hammersmith & Fulham and other London boroughs, **the real scope for HS2-HS1 is for a national and London region connector railway serving a variety of traffic flows**, in addition to the international trains. This will also improve domestic links to the Midlands, the North and Scotland.
9. The cost of double rather than single track from Old Oak to the HS1 tunnel is in outline put by Arup at £1,500m, excluding any additional track through Camden Road.
10. For a change in cost indicated in outline by Arup as 65%, it is possible to identify a 300% or greater increase in train services, so the larger scheme is potentially better value for money and achieves greater results for the UK economy. There are many new flows that can be accommodated. We envisage up to 12 to 15 trains per hour in each direction including the international trains, and more as traffic matures.
11. **These new flows include:**
 - **Inter-regional via Old Oak interchange.**
Eg, between London & Home Counties origins and Midland/Northern/Scottish cities (trains may run through, or connect at Old Oak as the London InterCity interchange for UK high speed services North and West).
 - **Intra-regional within London & Home Counties.**
This will make better use of a new railway and build new traffic flows stimulated by Old Oak interchange and by its London-scale development potential.
 - **Relief for selected rail corridors within London.**
Some corridors are already expected to be overloaded in the 2020s and 2030s (see TfL's HLOS2 paper), and some currently have no options for how overcrowding might adequately be mitigated.
 - **A second London terminal at Old Oak (or through route) for Kent high speed trains.**
At a foreseeable point the demand for these trains will exceed the available 3-platform capacity at St Pancras International.
12. Hammersmith & Fulham Council considers that only a substantial scale of new traffic flows will fully reward the costs of HS2-HS1. Clearly if a significant number of inter- and intra-regional domestic trains used HS2-HS1, then Old Oak would need some specific platform accommodation for these services, rather than rely solely on the HS2 platforms. The onwards projection of some services should be considered when designing the layout and orientation of such platforms.
13. Overall, the HS2-HS1 link should be built for the Britain of 2030-2050. Outline modelling has been undertaken which illustrates the potential for some new London & Home Counties services via Old Oak Central.^{4 5}

⁴ Modelling has at this stage focused on travel just to Old Oak and to Central Birmingham, with options being car (offpeak times), train (as now via interchanges and via London Euston for Birmingham), HS2 via Euston, and HS2-HS1 link via Old Oak. A consistent set of journey and interchange times were defined, with test routes using existing or potential new connections into a HS2-HS1 railway. At this stage, all modelling assumes an interchange at Old Oak Central rather than through trains, so this is a harder test to meet with journey times.

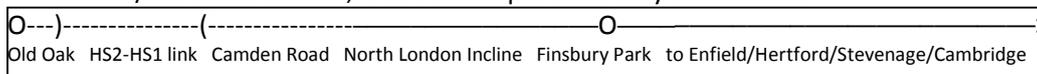
14. Journey time savings are quoted for travel to Central Birmingham via Old Oak. The high connectivity at Old Oak will in practice allow many more cross-region, town-to-town and suburb-to-suburb journeys to be undertaken by rail, so creating a new public transport travel market largely at present confined to car including the M25 and other arterial roads.

15. The following services and connections were explored in this high-level assessment.

Schemes with favourable journey time savings:

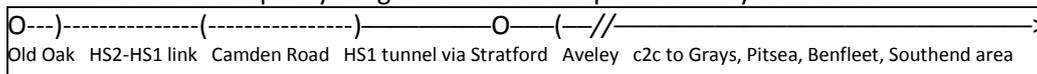
- **Great Northern Line:**

HS2 Phase 2 frees up some long distance train slots. New direct fast trains from Cambridge and selected intermediate stations could save 9-10 minutes overall to Central Birmingham, compared to joining HS2 at Euston. Trains would use the existing single-track North London Incline to reach the HS2-HS1 link and Old Oak. This option avoids using the HS1 tunnels. An inner suburban option may also be possible, eg via Enfield/Hertford. Overall, 4 to 6 trains per hour may be feasible.



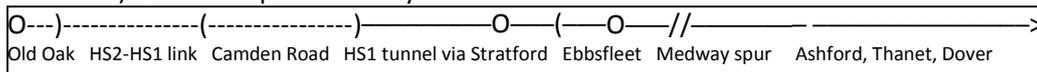
- **Southend and Thames Gateway via c2c and HS1:**

A new grade-separated connection with HS1 at Aveley (where c2c and HS1 cross) would achieve journey time savings of 20-30 minutes with a Kent-style high speed service to Stratford International and Old Oak. A new service would offer fast access to the northern Thames Gateway towns, and relieve Fenchurch Street terminus which has limited further capacity for growth. 2-3 trains per hour may be feasible.



- **HS1 Kent high speed trains running to Old Oak as well as St Pancras International:**

While indicated journey time savings are small, about 5 minutes, another London destination may be vital once traffic demand builds up at Old Oak and once St Pancras International's Kent platforms become fully occupied (there are only three platforms there). 2-3 trains per hour may be feasible.



16. With several services, a regular interval cross-London regional service via Old Oak and Stratford International may be offered.

17. Schemes with unfavourable journey times, not supported on initial analysis:

- **New West Anglia link into HS1 tunnel via Stratford Temple Mills depot curve:**

Trains via Tottenham Hale might operate to Old Oak. This does not offer journey time savings compared to using the Victoria Line interchanges and Euston.

- **Great Eastern Line via interchange at Stratford Regional to Stratford International station and domestic trains to Old Oak:**

The Crossrail 1 interchanges at Stratford Regional and Old Oak are comparable in journey time and avoid the longer interchange to Stratford International.

⁵ Separate to HS2-HS1, there are other new connectional possibilities at Old Oak interchange. Three identified by TfL are: link via Dudding Hill line to Thameslink North/Midland Main Line; South London and Milton Keynes via Southern services; South West London via orbital trains to Hounslow.