HS1 Link – The View from London

For HS2 Growth and Connectivity Conference

12 September 2014
1. TfL Position on HS2 & Hybrid Bill Petition

2. HS1 Link Issues & Possible Options
Importance to London: More than 70% of HS2 trips are forecast to start/finish in London.

The Mayor is supportive of HS2 (included in Mayor’s Transport Strategy), subject to the following issues being addressed:

- **Euston Station dispersal** (including provision for Crossrail 2);
- **Old Oak Common** must be connected to the London Overground network;
- A **HS2 – HS1 connection** with no adverse impacts (particularly to the Overground); and
- Minimise **environmental impacts** along the route.

Good progress has been made with HS2 Ltd to improve their original proposals - some of the Mayor’s conditions were reflected in Hybrid Bill.
1. OSD / Better station: Provision for major development and a station reflecting the EAP principles.

2. LU Construction impacts: Non-stopping of services through station for long periods & limited access to station until 2024 are not acceptable. To TfL, alternative construction proposals are required.

3. Construction impacts on the TLRN: Current proposals require more work on alternative construction methods and traffic management measures including reducing construction vehicle movements.

4. Overground construction impacts: Disruption to Overground Services need to be minimised.

5. Onward Dispersal: HS2 have not adequately demonstrated how the additional onward travel demand can be accommodated on the Euston street network.

6. Crossrail 2: The Hybrid Bill design not yet clear how the new Crossrail 2 scheme will be incorporated into the Euston station design.

TfL petition items at Euston
TfL Petition items at Old Oak Common

1. **Overground station on NLL & WLL**
   - An Overground station has the potential to substantially enhance orbital connectivity between HS2 and north, west and south London, removing 10% of HS2 passengers from Euston (and zone 1) as well as support wider regeneration of the OOC area.

2. **Provision for Crossrail 1 to the WCML**
   - An extension of Crossrail could relieve crowding at Euston station by removing 40% of mainline (10% of all rail) passengers as well as provide more direct journey opportunities to central London and Docklands.

3. **Walk & cycle route to North Acton**
   - Improving walking and cycling connections will assist with passenger dispersal and enhance local connectivity with west and northwest London – HS2 is only making provision.

4. **Crossrail 1 depot & service impacts**
   - There are multiple interfaces between HS2 and Crossrail 1 including subsidence, highway/rail access and land take on the depot as well as adverse impacts on delivering the Crossrail service across the network.

5. **Eastern highway access**
   - Providing highway access to the OOC station from the east is essential in relieving road congestion, improve bus network functionality, as well as enhancing OAPF accessibility.

6. **Closures on Old Oak Common Lane**
   - The adverse highway impacts of extended closures on Old Oak Common Lane are likely to be widespread and a revised approach is required.

[Link to TfL Planning petition](http://www.publications.parliament.uk/pa/cmhs2/petitions/0497.pdf)
TfL Petition items: Line-Wide

1. **Ruislip Depot**
   Closure of NR sidings for construction of HS2’s West Ruislip tunnel portal will adversely affect access to/from Ruislip Depot. Mitigation will be sought from HS2 Ltd to minimise the impact on LU operations.

2. **Greenpark Way**
   The removal of four tunnel boring machines at this extraction pit requires realigning a freight line through the embankment supporting the Central line. HS2 Ltd must demonstrate the construction impacts on LU operations and revise its approach if necessary.

3. **HS2-HS1 link**
   Bill proposal to link HS2 to HS1 via North London Line is not fit for purpose, adversely impacting passenger & freight services and the local community – need to influence alternative options study remit.

4. **Construction Policy / CoCP**
   Reducing environmental impacts along the route by securing a more rigorous Construction Code for example in reducing the number of construction vehicles to/from worksites for excavated and other construction materials.

5. **F’Sidings:**
   HS2 plans for a satellite compound at Willesden ‘F’ Sidings to support the construction of Euston station will adversely impact the ability to deliver this capacity upgrade.
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TfL position on the HS2-HS1 link

TfL raised three specific concerns with the suitability of the North London Line alignment for the HS2-HS1 link

The link should not impact on North London Line operations, particularly performance robustness and constraining growth of the Overground network,

Passenger demand on the Overground network has grown by 300% since 2007 and is forecast to grow a further 70% by 2031

The current proposal does not take account of the potential for domestic demand or for the emerging aviation strategy for the UK, which will be informed by the outcomes of the Davies Commission, in 2015.

The planned capacity of the link would be up to 3 trains per hour (tph) but it is recommended that a higher frequency service of 4 to 6 tph would be required to accommodate domestic demand and support a new hub airport.

The impact of constructing the link on the local highway and railway networks is likely to be significant, requiring multiple road closures and possessions. This impact will be compounded by highway closures at Euston which will take place at the same time.

Highway closures and railway possessions required periodically over a six to seven year period to construct new bridges. In addition, a blockade of the NLL through Primrose Hill of six months will also be needed, requiring a diversion of freight traffic through already congested routes.
Increasing demand for Overground services

**Future Year Demand Forecast for Overground (Committed schemes including LOCIP)**

- **Growth in Overground Demand from 2013**
  - to 2016 - +22.3m (+15.6%)
  - to 2021 - +47.6m (+33.2%)
  - to 2026 - +62.6m (+46.4%)
  - to 2031 - +102.8m (+71.8%)

- **2015 – 5-car network (+25% capacity) committed**
- **2018 – 2tph additional (+25% capacity) commit in late 2014**
- **2026 – 6-car network (+20% capacity) likely anticipated**

- **Since 2007 – 300% growth**

**Legend**
- Overground - GOB
- Overground - Watford DC
- Overground - NLL/WLL
- Overground - ELL
Capacity to support faster & higher frequency services

- The NLL viaduct alignment for the HS2-HS1 link presented a significant capacity constraint.
- A link under North London could work if a higher speed, fully segregated connection was constructed.
- Discussions with HS1 indicate that capacity available on HS1 could facilitate a mix of domestic and international traffic but service structure would be defined by link capacity and HS2 utilisation.
- Case for an HS1 link is likely to be influenced by a number of factors including service structure, times of day, days of week, progression of Heathrow spur, whether trains from HS1 terminate at OOC or continue to the North, HS2's operating model, demand growth, etc.
Possible Strategic Case for a Better HS2-HS1 Link

- Link could significantly reduce demand on the M25
- Demand is likely to exceed 20,000 trips per day compared to 3,000 for international services alone
- Even without significant modal shift, business case for an inter-regional link is more than 3 times an international link alone
Provision for HS1 tunnelled link
Option 1: Preserve third tunnel 'spur' from Old Oak

HS2 Phase 1: Drive the tunnel as far as TBM reception chamber

HS2 Phase 2: Drive TBM from the east to arrive at reception chamber
Provision for HS1 tunnelled link  
**Option 2: amend Old Oak Common layout**

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**Phase 1 works**

**Phase 2 works**

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**HS2 Phase 1:** The HS1-HS2 link tunnel must be designed to lie on the outside of the three tunnels, to avoid severing cross-passages and affecting shafts. Redesign of Old Oak Common station box is required to achieve this.

**HS2 Phase 2:** Requires tunnelling once HS2 and Old Oak Common station are operational.
Provision for HS1 tunnelled link
Option 3: construct twin bore turnout cavern

HS2 Phase 1: Construction of turnout caverns and stub tunnels in advance of the arrival of the Euston tunnels’ TBMs. Grade separation of the Euston tunnels is required.

HS2 Phase 2: Undertake tunnelling from the east once HS2 is operational to arrive at turnout cavern.
A tunnelled option provides an overall better solution

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<tr>
<th>Description of proposal</th>
<th>HS2 Hybrid Bill proposal</th>
<th>TfL proposal (fully tunnelled link)</th>
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<td>Single track link operating in tunnel and on the NLL, includes singling of the NLL through Primrose Hill</td>
<td>Fully segregated twin bore tunnelled link with provision in first phase to take account of growth / domestic demand</td>
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| Impact on the NLL (performance robustness and future growth) | Detrimental impact to future NLL performance and capacity | No impact on future NLL capacity or performance as link is fully segregated |

| Providing a higher capacity link to support domestic and potential airport demand | Capacity of link is constrained to an absolute maximum of 3tph by single track and slow running adjacent to NLL | Allows flexibility to construction a fit-for-purpose link, suited to identified demand with increased running speeds |

| Construction impacts on railway, highway and local communities | High impact through Camden; several properties required | Most impacts are avoided, except at tunnel portal sites |

| Local impacts | 8 roads required to be temporarily stopped up requiring diversion of 140 buses per hour | Some roads may need stopping up to allow for portal sites |

| Deliverability of the scheme in Phase 1 | Many authorities have petitioned against the HS1 link. Significant cost and risk to Hybrid Bill process | Risk of scheme never being delivered by splitting between phases. |

| Overall | High risk, high cost for a link which has poor business case and significant stakeholder opposition | Potentially a lower risk solution which could help to provide future capacity needs. **Provision needed in Phase 1** |
Next Steps

• DfT have specified that HS2 Ltd will look at alternatives to the link

• Continue to work with the DfT, HS2 Limited and NR to address the issues identified in the Higgins Report

• Continue to influence the remit of the DfT study on HS1 link alternatives TfL believe they have a feasible solution

• TfL are not aware that any work has yet taken place looking at alternatives to the Link

• Secure protections within Phase 1 to ensure that the HS1 link is not a missed opportunity and provision is made as a priority, most critically, the Old Oak tunnel portal