

The implications of HS2 Euston Action Group's proposal to locate the main HS2 London terminus at Old Oak Common

17 July 2015

Executive Summary

The key points are:

- Even if the journey time and other passenger disbenefits could be justified, there are no viable options locating the main London terminus at Old Oak Common with some trains continuing to Euston;
- The proposal for a link to Euston via the West Coast Main Line has major disadvantages compared with the Promoter's Euston tunnel, and it would be more expensive;
- A main terminus at Old Oak Common would not be consistent with the transport strategy in the London Plan, and would substantially compromise the regeneration proposals for the surrounding area.

This paper summarises the Promoter's analysis of a HS2 Euston Action Group (HEAG) proposal to locate the main HS2 terminus at Old Oak Common with a link to Euston for a few HS2 trains. The link would be from Old Oak Common to the West Coast Main Line (WCML) in the vicinity of Queens Park.

The transport and train operation conclusions of this paper are:

- Terminating all HS2 trains at Old Oak Common would reduce the HS2 overall patronage and the revenue by over 10% and the economic benefits of the Phase by 15%. Patronage between London and the West Midlands would be reduced by over 20%;
- Compared with the Proposed Scheme for a terminus at Euston and an interchange at Old Oak Common the two terminus proposal would increase journey times for HS2 passengers to many parts of central, north and south London;
- When Phase 2 of HS2 is implemented, there would be insufficient capacity on Crossrail to accommodate HS2 passengers to Central London; and
- The proposal to run only a few classic compatible trains to Euston would not be capable of supporting a viable train service specification, nor justify the cost of the Euston tunnel. A 5-6 platform HS2 station at Euston would incur most of the property demolition, adverse environmental effect and cost of the Proposed Scheme, but result in a much reduced HS2 train service to Euston. There are therefore no viable two terminus options.

The Promoter remains of the view that the HEAG proposal to locate the main HS2 terminus at Old Oak Common would be contrary to the principle established at Second Reading that the London terminus should be located at Euston. Nor would there be any purpose in further consideration of the HEAG option or any two terminus solution as none would be capable of supporting a credible operational specification, or demonstrate sufficient passenger benefits to justify the cost.

Introduction

1. On 7 July the HS2 Euston Action Group (HEAG) presented proposals for locating the main HS2 terminus at Old Oak Common. It was contended that, given the challenges of terminating HS2 at Euston, there is an argument for the role of Old Oak Common to be much expanded with a link to Euston via the existing WCML tracks. (Transcript p.18). In support of this proposal the Petitioner maintained (Transcript p. 5):
 - Old Oak Common has the advantage over Euston of being on the route of Heathrow Express and Crossrail;
 - Passengers getting off at Old Oak Common would get quicker connections to most of central London than by going to Euston;
 - Not only would Old Oak Common be better for passengers, it would cost less than Euston ... 'especially as Euston would only be able to cope with the extra passengers if an additional £25 billion is spent on Crossrail [2]'; and
 - Using Old Oak Common would avoid decades of disruption to classic services in and out of Euston.

The Petitioner also claimed that the Promoter has not assessed whether Old Oak Common should be the major London terminus.

2. In his response to the HEAG presentation on 7 July, Counsel explained that the Promoter has examined and consulted on the options since 2009, including terminating HS2 at Old Oak Common. The principle of locating the London terminus at Euston was established at Second Reading and this is reflected in the instructions and remit of the Select Committee.

The HEAG proposal

3. In essence, the core elements of the HEAG proposal are:
 - A terminus station at Old Oak Common of similar design to the Proposed Scheme, but with twelve HS2 platforms instead of six;
 - A tunnel link from Old Oak Common to a grade separated junction on the WCML in the vicinity of Queens Park station so that while most HS2 services would terminate at Old Oak Common, a few could continue to Euston via the WCML; and
 - Little or no land-take or works to the track layout or platforms at Euston.
4. The HS2 indicative London service pattern comprises 10ph for Phase One and 16tph for Phase Two with all trains stopping at both Old Oak Common and Euston. The HEAG proposal does not include a service pattern. As the proportion of trains terminating at Old Oak Common and Euston is a defining feature of the proposal, two possibilities are considered in this paper – a four train per hour (tph) HS2 service to Euston to reflect the Petitioner's aspiration that Old Oak Common should be the main terminus, and a 10tph HS2 to Euston scenario which the Promoter considers to be the minimum that is operationally practicable and consistent with the Government's strategic objectives for HS2. Other service possibilities between 4tph and 10tph can then be interpolated.

Previous consideration of Old Oak Common terminus options

5. Since 2009 the Promoter has prepared, sifted and selected options for the London stations. The reasons for not promoting a terminus at Willesden Junction or Old Oak Common were set out in December 2009 and remain the same today:

'Willessden Junction and Old Oak Common. Further demand analysis continued to suggest that the journey time penalty for central London passengers using these stations as the only London terminal was likely to severely reduce the benefits of HS2. A Crossrail connection at Old Oak Common or Willessden Junction would allow some passengers a quicker journey time to the East or West of London, but the bulk of the demand for HS2 would come from the central, north and south of London which would be best served by a central London station.'¹

6. The economic analysis in 2010/11² assessed the benefits of a terminus at Old Oak Common compared with a terminus at Euston and an interchange station at Old Oak Common (as in the Proposed Scheme) for Phase One of HS2 in 2033 as follows:

'The figures show that the removal of the onward service to Euston reduces PVB³ by £3.8bn relative to Eus+OOC (over 15%) and revenue by £1.1bn (nearly 10%).

The net reduction in PVB is the result of

- Decreases in Local Leg⁴ benefit (£1.9bn);
- Decreases in in-vehicle time savings (£1.2bn);
- Decreases in wait benefits (£0.5bn); and
- Other more minor changes in other journey cost components.'

7. The geographical analysis showed that the biggest effect would be a 23% reduction in London-West Midlands patronage, (10,000 passengers per day, comprised of 6,500 transferring back to the WCML and 3,500 fewer generated trips). For journeys between London and the North West there would be a slight increase in patronage but a significant loss of benefits. It should be noted that this appraisal was undertaken using a previous version of the model and the forecasts, assumptions and train service specification have all changed since 2012.
8. In 2011/12 HS2 Ltd reviewed the option for terminating the line at Old Oak Common following representations made during the public consultation⁵. The analysis concluded:

'Old Oak Common was rejected as the London terminus given that the journey time penalty for many central London passengers would reduce the benefits of HS2. Passenger dispersal would also be an issue, Crossrail being the only option for passengers to continue their journey rapidly into London. Any service interruption to Crossrail services would potentially result in having to close HS2 as passengers

¹ London to West Midlands and Beyond, HS2 Ltd, December 2009, p.59.

² Report WP1 Analyses of London Interchange Options and Markets, Appendix A pp.8-10, HS2 Ltd May 2011.

³ Present Value of Benefits

⁴ Within London

⁵ Route Selection and Speed, HS2 Ltd, January 2012, para.5.2.7.

would have no adequate alternative onward connection option at Old Oak Common. A terminus station would also require more land than an intermediate station, and given constraints in the area such a proposition would be difficult. The additional land would include the Crossrail depot area and extend across the North London Line and central Line into a significant part of Park Royal.'

9. Since then the Promoter has considered various other options and variants, many in response to suggestions by the community. They include double deck configurations at Euston and, most recently, Mr. Sam Price petitioned against the Bill in favour of a 'Euston Express' proposal for a route via Old Oak Common that would join the West Coast Main Line (WCML) at Queens Park and thence on the surface to Euston. This proposal was referred to in the HEAG evidence to the Committee on 7 July. It was reviewed for the Promoter by Parsons Brinkerhoff and Mott MacDonald (PB/Mott) earlier this year and their report is attached to this submission. The HEAG proposal for the HS2 link between Old Oak Common and Euston includes the Euston Express link to the WCML at Queens Park.

Crossrail capacity, journey times and onward dispersal

10. Transport for London (TfL) does not support proposals for terminating HS2 at Old Oak Common for two main reasons:
 - Crossrail would not have sufficient capacity for all the HS2 passengers with destinations into or across central London; and
 - there would be a substantial journey time penalty and increased number of interchanges required if these passengers had to change at Old Oak Common rather than at Euston.

These issues are examined below. It should be noted that the patronage and onward dispersal analysis does not include the HS1-HS2 Link.

Crossrail capacity

11. If all HS2 passengers were to alight at Old Oak Common, a consequence would be significant crowding pressure on Crossrail as it provides the only high capacity access to central London. Passengers attempting to board eastbound services closer to central London would suffer increased station congestion and on-train crowding as well as additional journey times, due to an increased likelihood of being unable to board trains.
12. TfL estimates that, for Phase One of HS2, peak crowding on Crossrail trains would reach the practical capacity at 4 passengers/m² compared with 3.3 passengers/m², without HS2. These estimates indicate that crowding could (just) be accommodated. However there would be little space for passengers boarding services east of Paddington, with HS2 passengers using up more than 10% of Crossrail capacity on already crowded services, eroding the forecasted benefits generated by Crossrail.
13. By 2041, with both phases of HS2 are operational, Crossrail crowding is estimated to be over 5 passengers/m² (compared with 3.9 passengers/m² without HS2). Terminating Phase 2 services at Old Oak Common would thus overwhelm Crossrail HS2 passengers, taking up over 15% of Crossrail capacity, leading to unacceptable levels of crowding.

14. Providing a reliable train service for customers is a fundamental part of the operations of Crossrail and minimising factors that negatively impact upon service reliability is essential in achieving this aim. A marginal increase in train loadings as they pass through busy sections between Paddington and Liverpool Street risks causing extended station 'dwell' times as more passengers board and alight. This would result in a degradation of achievable train service frequencies, effectively reducing the actual capacity of Crossrail and its ability to deliver reliable services.

Journey times

15. Table 1 shows the actual time lost and saved by changing at Old Oak Common compared with changing at Euston. The Proposed Scheme combines the advantages of Old Oak Common and Euston, whereas the Petitioner's proposal would result in longer journeys to destinations where Euston is the better interchange. In terms of actual time to stations, Euston's is much the better interchange for north central and north London and is better for most of south London. Within central London the relative advantage in actual time can change significantly over a short distance depending on how many interchanges are necessary.

Table 1 Journey times to/from OOC HS2 to selected key locations, alighting/boarding at Old Oak Common, or at Euston

To/From	Railplan Routing																			
	TO LONDON					FROM LONDON					OOO					Euston				
	OOO HS2 platform (621487)	OOO via Euston HS2 platform (210287)	Difference (OOO minus Euston)	OOO HS2 platform (621487)	OOO via Euston HS2 platform (210287)	Difference (OOO minus Euston)	Lines	Changes	Lines	Changes	Lines	Changes	Lines	Changes	Difference					
EUSTON STATION ENTRANCE 1	29	12	17	29	14	15	Crossrail, Northern	1	Walk	0	1	Walk	0	1						
KING'S CROSS (M) STATION ENT 1	30	16	14	30	18	12	Crossrail, D/C, H&C/C	2	SSL	0	2	SSL	0	2						
FINSBURY PARK STATION ENT 1	36	24	12	36	26	10	Crossrail, walk, Victoria	1	Victoria	0	1	Victoria	0	1						
WOOD GREEN STN ENTRANCE 1	43	31	12	43	33	10	Crossrail, walk, Victoria, Piccadilly	2	Victoria, Piccadilly	1	1	Victoria, Piccadilly	1	1						
OLD STREET STN ENTRANCE 1	33	23	10	33	26	7	Crossrail, Northern	1	Northern	0	1	Northern	0	1						
HENDON STATION ENTRANCE 1	50	43	7	50	45	5	Bus, NLL, MML	2	Northern (Kentish T), MML	1	1	Northern (Kentish T), MML	1	1						
BAKER STREET STN ENTRANCE 1	24	18	6	24	20	4	Crossrail, Bakerloo	1	SSL	0	1	SSL	0	1						
VICTORIA STATION ENTRANCE 1	30	24	6	30	27	3	Crossrail, walk, Victoria	1	Victoria	0	1	Victoria	0	1						
BANK STATION ENTRANCE 1	32	27	5	32	29	3	Crossrail to LST, walk	0	SSL to Moorgate, walk	0	0	SSL to Moorgate, walk	0	0						
FARRINGDON STN ENTRANCE 1	23	18	5	23	20	3	Crossrail	0	SSL	0	0	SSL	0	0						
CLAPHAM JUNCTION STATION ENT 1	41	36	5	41	38	3	Crossrail, walk, Victoria, Southern	2	Victoria, Southern	1	1	Victoria, Southern	1	1						
LIVERPOOL STREET STATION ENT 1	28	23	5	28	26	2	Crossrail	0	SSL	0	0	SSL	0	0						
LONDON BRIDGE STATION ENT 1	33	28	5	33	31	2	Crossrail, Jubilee	1	Northern	0	1	Northern	0	1						
WATERLOO STATION ENTRANCE 1	29	25	4	29	28	1	Crossrail, Northern	1	Northern	0	1	Northern	0	1						
HARROW-ON-THE-HILL STATION ENT 1	43	40	3	43	42	1	Bus, NLL, Bus	2	Met	0	2	Met	0	2						
LEICESTER SQUARE STATION ENT 1	24	21	3	24	23	1	Crossrail, Northern	1	Northern	0	1	Northern	0	1						
WESTMINSTER STN ENTRANCE 1	28	26	2	28	28	0	Crossrail, Jubilee	1	Northern, SSL	1	1	Northern, SSL	1	1						
NEW CROSS GATE STATION ENT 1	46	44	2	46	46	0	Crossrail, ELL	1	Northern, Southern	1	1	Northern, Southern	1	1						
TOTTENHAM COURT ROAD STATION ENT 1	21	20	1	21	22	-1	Crossrail	0	Northern	0	0	Northern	0	0						
OXFORD CIRCUS STATION ENT 1	21	20	1	21	22	-1	Crossrail to Bond St, walk	0	Victoria	0	0	Victoria	0	0						
STRATFORD STATION ENTRANCE 1	35	35	0	35	37	-2	Crossrail	0	SSL, Central	1	-1	SSL, Central	1	-1						
WHITECHAPEL STN ENTRANCE 1	29	31	-2	29	33	-4	Crossrail	0	SSL, Crossrail	1	-1	SSL, Crossrail	1	-1						
CANARY WHARF STATION ENT 1	35	38	-3	35	40	-5	Crossrail	0	SSL, Crossrail	1	-1	SSL, Crossrail	1	-1						
ISLE OF DOGS STATION ENTRANCE 1	32	35	-3	32	37	-5	Crossrail	0	SSL, Crossrail	1	-1	SSL, Crossrail	1	-1						
BOND STREET STN ENTRANCE 1	20	24	-4	20	27	-7	Crossrail	0	Victoria to Oxford C, walk	0	0	Victoria to Oxford C, walk	0	0						
HIGH ST KENSINGTON STATION ENT 1	25	32	-7	25	34	-9	Crossrail, D/C	1	H&C/C, D/C	1	1	H&C/C, D/C	1	1						
RICHMOND STATION ENTRANCE 1	43	51	-8	43	53	-10	Bus, NLL	1	Northern, SWT	1	1	Northern, SWT	1	1						
PADDINGTON STN ENTRANCE 1	16	25	-9	16	27	-11	Crossrail	0	H&C/C, D/C	1	-1	H&C/C, D/C	1	-1						
SOUTH RUISLIP STATION ENT 1	34	53	-19	34	56	-22	Bus, Central	1	SSL, Chiltern, walk, Met, walk	2	-1	SSL, Chiltern, walk, Met, walk	2	-1						
EALING BROADWAY STATION ENT 1	14	41	-27	14	43	-29	Crossrail	0	Northern, Crossrail	1	-1	Northern, Crossrail	1	-1						
HEATHROW CTA Station Entrance	35	62	-27	35	65	-30	Crossrail	0	Northern, Crossrail	1	-1	Northern, Crossrail	1	-1						

NOTES

- 1: Times rounded to nearest minute. Differences calculated based on rounded times
- 2: Euston HS2 to LU Ticket Hall is same level via "Combi" at end of HS2 platforms
- 3: Time from OOC to EUS assumed as 7 mins (arrival to arrival)

Onward dispersal

16. The geographical spread of passenger destinations has been modelled for each station. In order to predict passenger behaviour, the risk of delay and inconvenience of changing trains must be added. Travellers choose their routes and modes of transport largely on cost and journey time, but where they have a choice and cost is not an issue, as on the Underground, they are more heavily influenced by other factors such as crowding, comfort, convenience and reliability. The TfL 'Railplan' model predicts travel behaviour in response to proposals for changes to the networks using 'generalised time' in order more accurately to reflect actual passenger behaviour. Generalised time includes not only actual travel and wait time but also interchange, crowding and discomfort and inconvenience penalties.
17. Figure 1 shows the modelled geographical spread of destinations for passengers interchanging at Euston and Old Oak Common. Euston will be the preferred interchange for most passengers to central London because it has a much wider choice of lines and modes for onward journeys and a much wider area can be reached with fewer changes.

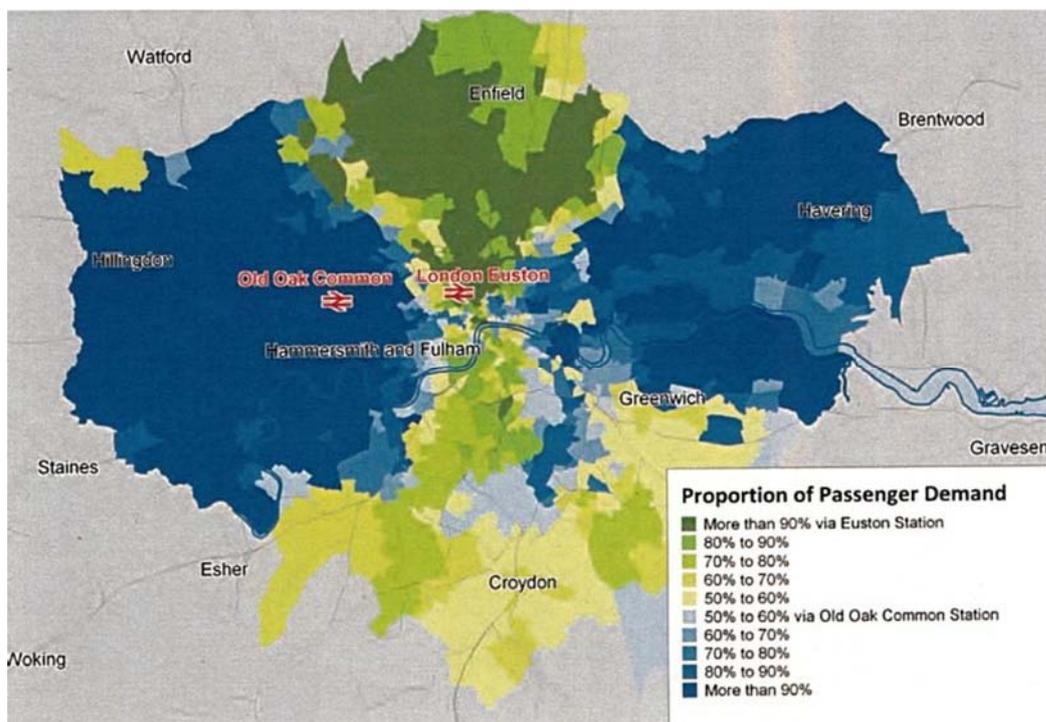


Figure 1: Proportion of HS2 Passenger Demand via Euston and Old Oak Common ⁶

Figures 2 and 3 show the London destinations of HS2 passengers changing at Euston and Old Oak Common assuming implementation of the Proposed Scheme⁷. Euston is the interchange of preference for most passengers bound for the concentrations of destinations in Central and Inner London. Passengers for the West End, West London, Heathrow and Docklands are more likely to travel via Old Oak Common.

⁶ Mott Macdonald 2012 (data represents example trips using HS2 from London to Manchester) from Demand and Appraisal Report: HS2 London - West Midlands, MVA, April 2012

⁷ Source: TfL Railplan 2041 AM peak period destinations

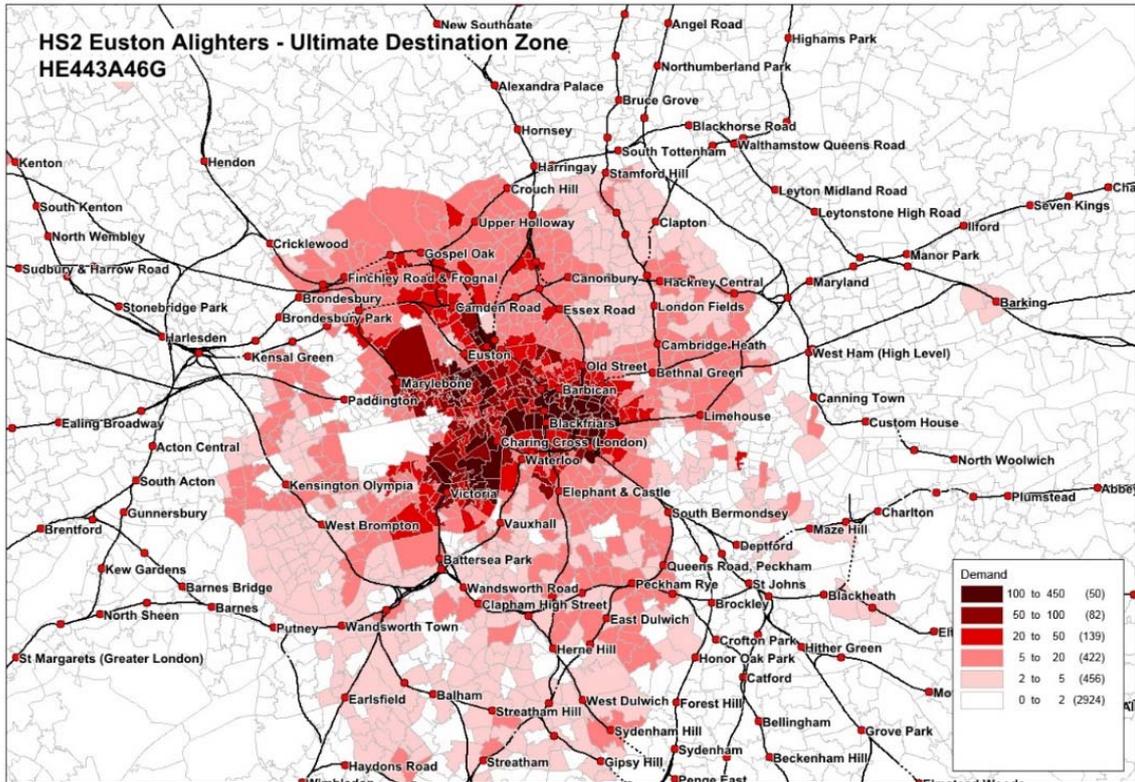


Figure 2 Destinations of HS2 passengers interchanging at Euston

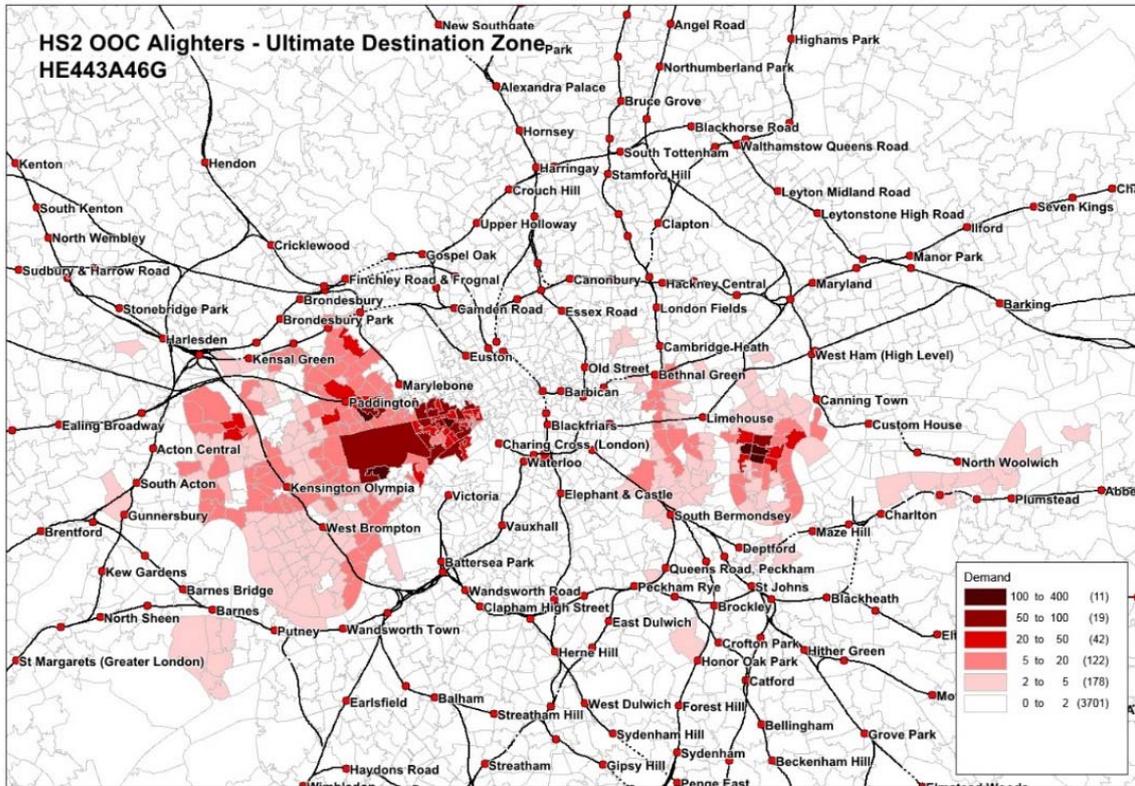


Figure 3 Destinations of HS2 passengers interchanging at Old Oak Common

London connectivity and resilience

18. Old Oak Common will be served by Crossrail for access to central and east London and indeed this is part of the rationale for an HS2 interchange station. But no other high capacity lines are planned. Stations on the North London Line and West London Line are proposed by TfL and would improve connectivity to the Old Oak Common area including the new development. But interchange times from HS2 would be long and capacity will be constrained to cater for a significant increase in demand at Old Oak Common.
19. If Crossrail is suspended for any reason, the only realistic option for most HS2 Crossrail passengers would be to queue to board Central Line trains at North Acton, 800m to the east of the HS2 station. In contrast, at Euston there is a choice of two branches of the Northern Line, the Victoria and the Circle/Metropolitan/Hammersmith & City Lines at Euston Square, which would be accessible via a new eastern ticket hall. If any one of these lines is suspended, the others offer alternative routes. In addition, unlike Old Oak Common, Euston is on the edge of the central area and buses, taxis, cycle or walking are viable alternatives for many passengers. In the much longer term there might be other transport schemes for Old Oak Common if the Mayor's development vision comes to fruition. But at this stage none are even envisaged, whereas at Euston the Promoter has safeguarded the route of Crossrail 2 and Transport for London is in the process of preparing proposals.

West Coast Main Line and HS2 capacity

Capacity effect of HS2

20. The step-change in rail capacity that would accrue as a result of implementing the Proposed Scheme is described in the Strategic Case for HS2⁸. HS2 has the potential to double the number of seats from Euston and is equivalent to building two three lane motorways between London and the Midlands and the North. However, this additional capacity can only be fully utilised and its benefits spread over a wide area if HS2 captures a large proportion of the long distance (over 100 miles) travel market. In order to do so, travellers must be persuaded to transfer from the existing main rail lines and other modes.
21. The effect of HS2 on WCML capacity is twofold:
 - *Seat capacity* – It is estimated that HS2 Phase One would attract approximately half the passengers who would otherwise travel on WCML trains and, when Phase Two is operational, two thirds of these passengers would transfer. This would enable seats and train paths to be released on for shorter distance journeys – not only the WCML but with Phase Two the Midland Main Line and the East Coast Main Line as well. In order to achieve this transfer of passengers, origin to destination journey times are crucial.
 - *Train path capacity* – The more HS2 trains continue via the WCML to Euston, the fewer train paths would be available for shorter distance journeys. A post-HS2-

⁸ Strategic Case for HS2, DfT, paragraphs 3 2 12-22

opening train service on the WCML will be developed through the normal consultative railway industry processes. However, in broad terms the effect of transferring half the long distance passengers to HS2 would be that only approximately half of the fifteen WCML fast line train paths would be needed to serve those stations in the Midlands and the North that are not served by HS2. In addition, slow line services could be rationalised to serve shorter distance, inner suburban, destinations which would enable a 9tph slow line peak passenger service into Euston compared with the current maximum of 8tph, and there would be an additional hourly path for the Southern service to West Croydon (not going to Euston) and one for freight trains in off peak hours. Thus, depending on whatever post 2026 timetable is approved, HS2 would release very approximately 8 train paths on the WCML to Euston for other services.

Effect of the HEAG proposal on capacity

22. As noted above, in 2011 it was estimated that a terminus at Old Oak Common would reduce the HS2 patronage to/from the West Midlands by 23%. These passengers would prefer to travel on the WCML largely because it would be quicker as no price differential was assumed. Such a large loss of patronage would significantly compromise the objectives and business case of HS2 and would result in fewer seats being available for new passengers on the WCML.
23. Even if a 4tph service to Euston were practicable, it would reduce the capacity released by HS2 on the WCML by 40-50%, but in this scenario the capacity effect on the slow lines might not accrue either as it would be less likely that the train services could be rationalised. A 10tph service would absorb all the released capacity and call into question the point of building HS2.
24. A further capacity problem arises from platform length at Euston. The Petitioner proposes that classic compatible trains would run into Euston. The trains comprise 200m long units that have the capability to form a 400m long train. It is only possible to run 2 X 200m classic compatible train sets on the WCML if the platforms are long enough. If any significant number of trains to Euston were to be 400 metre formations, in practice all HS2 platforms at Euston would have to be 400m long, requiring major reconstruction and land-take as discussed below.

Train services

25. If the Petitioner's proposal were for only a token HS2 service to Euston, say 4tph, the first question that would arise is: which services would terminate at Euston? If only one of the three trains per hour to Birmingham, Manchester or Leeds assumed in the HS2 Economic Case were to go to Euston, the onward journey analysis suggests it would be by far the most popular train to catch. The Promoter does not consider that the consequent differential loadings would be practicable from an operational point of view.

26. The only practical solution would be for the least heavily patronised routes such as Liverpool, Preston or Scotland⁹ to run to Euston, while services to Manchester and Birmingham would terminate at Old Oak Common. Thus the most heavily loaded trains would tend to be the ones terminating at Old Oak Common, implying that a disproportionately high number of the HS2 passengers would be disadvantaged. Consequently, the Promoter considers that an 8-10tph service to Euston is the minimum that would be credible.

Is there a viable two terminus option?

27. The Petitioner is proposing a two terminus scheme with the 'Euston Express' Link to the WCML and a few 200m classic compatible HS2 trains running into the existing Euston Station. Other possible two terminus options include:

- Substituting the Promoter's Euston Tunnel for the Petitioner's Euston Express Link; and
- Options for more and longer HS2 trains into a less ambitious Euston station than the Proposed Scheme.

Euston Express Link or Euston tunnel?

28. The Promoter's proposed Euston tunnel would provide a full HS2 train service in tunnel to Euston for an estimated £564m¹⁰.

29. The PB/Mott analysis of the Euston Express proposal showed that it would be more expensive than the Euston Tunnel, more difficult to build and would have a far inferior operational capability. They estimated that the cost of the Euston Express proposed link to Queens Park and the associated works on the WCML would be £1,245m. This would be £681m more expensive than the Promoter's Euston tunnel proposal.

30. The Euston Express scheme that PB/Mott costed was for a full HS2 service to Euston. If, as the Petitioner proposes, only classic compatible trains continue to Euston, it would not be necessary to gauge clear the existing WCML tunnels and bridges between Queens Park and Euston for the larger HS2 trains. As a consequence the additional cost of the Euston Express scheme would be reduced. But it would still be approximately £100-200m more than the Proposed Scheme.

31. The Euston Express scheme would also entail substantial shortcomings, including:

- Severe disruption during construction
- Lack of capability to run 200m and 400m 'captive' HS2 trains
- Loss of released capacity
- Additional environmental effects and land take
- Longer journey times

⁹ As the Glasgow/Edinburgh trains are assumed to operate as 400 metre trains splitting at Carstairs even this may present difficulties.

¹⁰ PB/Mott p.104. All estimates excluding escalation, risk, contingency, land and property and client costs.

- Reduced capacity and capability for freight trains.

32. It is therefore concluded that any proposal for terminating most HS2 trains at Old Oak Common would include the Euston tunnel rather than the Euston Express Link.

Euston station configurations

33. The Petitioner's proposal for a few classic compatible trains terminating at Euston is not capable of providing a viable train service specification for the reasons explained, nor would such a limited service with no increase in capacity¹¹ offer sufficient benefits to justify the cost of the tunnel. The question that therefore arises is whether there are other options for a less ambitious Euston scheme if most of the HS2 trains terminate at Old Oak Common?

34. One possibility would be a five or six platform HS2 station. Any scheme for 400m trains at Euston would require widening the station 'throat' south of Mornington Street. Without the dive-under at Park Village east, such a station could accommodate seven HS2 trains per hour and, with a dive-under, ten trains per hour (as in the Promoter's AP3 scheme Stage A). Though the associated property demolition would be less than for twelve HS2 platforms, it would still be considerable, including property on the west side of Melton/Cardington Street, Wolfson House and most of the flats on the Regents Park Estate that are required for the Proposed Scheme. Despite this, the Euston train service options would be very limited – comprising, say, Birmingham and Manchester and Scotland, or else the other destinations, but not both.

35. Thus, the options are either for:

- a very limited 200m long HS2 classic compatible service with less capacity than the current WCML, the benefits of which would not justify the cost of the tunnel; or
- A 5-6 platform station that would incur most of the property demolition, adverse environmental effect and cost for a much reduced HS2 train service to Euston.

36. Neither of these options would offer an operationally viable train service specification and neither could be justified in benefit:cost ratio terms. It is therefore concluded that, even if the Euston tunnel is substituted for the proposed Euston Express link, there is no viable proposition for a two terminus solution.

Cost and engineering

37. As there is no viable option for a two terminus proposal, and no prospect of such a scheme being justified by a credible business case, there is no point in preparing a scheme and detailed costs for the infrastructure required for the Petitioner's proposals. However, some costs are known and the cost implications other elements can be inferred.

¹¹ In fact, without 400m capability, it is a capacity reduction as 200m HS2 trains have fewer seats than 11-car long distance or 12-car suburban trains.



Figure 4 Indicative footprint of a 12-platform station at Old Oak Common

38. Figure 4 provides an indication of the land at Old Oak Common that would be required for a 12-platform station. The most significant additional costs would be:

- Construction of a much larger HS2 station at the same depth as the Proposed Scheme (approximately 15m below ground level). A terminus station would need not only additional platforms but also additional servicing circulation and interchange facilities.
- A subterranean dive under tunnel to the west of the North London Line.
- Relocation of the Crossrail depot to the north of the station. No alternative location has been identified.
- It might be necessary to acquire properties in Hythe Road and divert the Grand Union Canal in order to provide sufficient space for the platforms and circulation around the station.

39. It is assumed that the tunnel to Euston would be the same cost in either option as the Euston Express proposal is not viable and would in any event be more expensive.

40. It is very difficult to assess what cost savings at Euston would actually accrue. For the Petitioner's proposal to run only a few 200m HS2 trains to Euston, most of the cost of the Proposed Scheme could be saved. However, such a solution would not justify the cost of the tunnel and the existing station would remain unimproved. In due course the Underground interchange works would probably be necessary and at some stage the station would need to be upgraded. A scheme to provide a minimum viable train service with capability for 400m HS2 trains would incur most of the cost of the Proposed Scheme for a much reduced operational specification and a substantial reduction in passenger benefits.

The London Plan and the longer term

41. The London Plan sets the policy framework for an integrated approach to planning and transport in London over the next twenty years. It is prepared in the context of a forecast

increase in Greater London’s population from 8.6 million in 2015 to 10 million in 2036. The Promoter has been working with the Mayor and Transport for London (TfL) to ensure an integrated approach to transport planning in London, and specifically that planning for passenger journeys from origin to destination is co-ordinated and not compromised by the design of the Proposed Scheme. This includes locating the London terminus at Euston, which the Mayor supports and is in the London Plan.

42. The capacity implications of an HS2 terminus at Euston are set out in the HS2 Environmental Statement (ES) Vol.5 Transport Assessment Part 4 and are assessed in the context of underlying growth in travel demand. Even without HS2, AM peak period rail passengers at Euston are forecast to increase by 19% 2012-26 and 46% 2012-41. The increases for the PM peak period are forecast to be 23% and 58% respectively (ES Vol. 5 Transport Assessment Part 3 paragraphs 6.3.58-9).

The next ten years

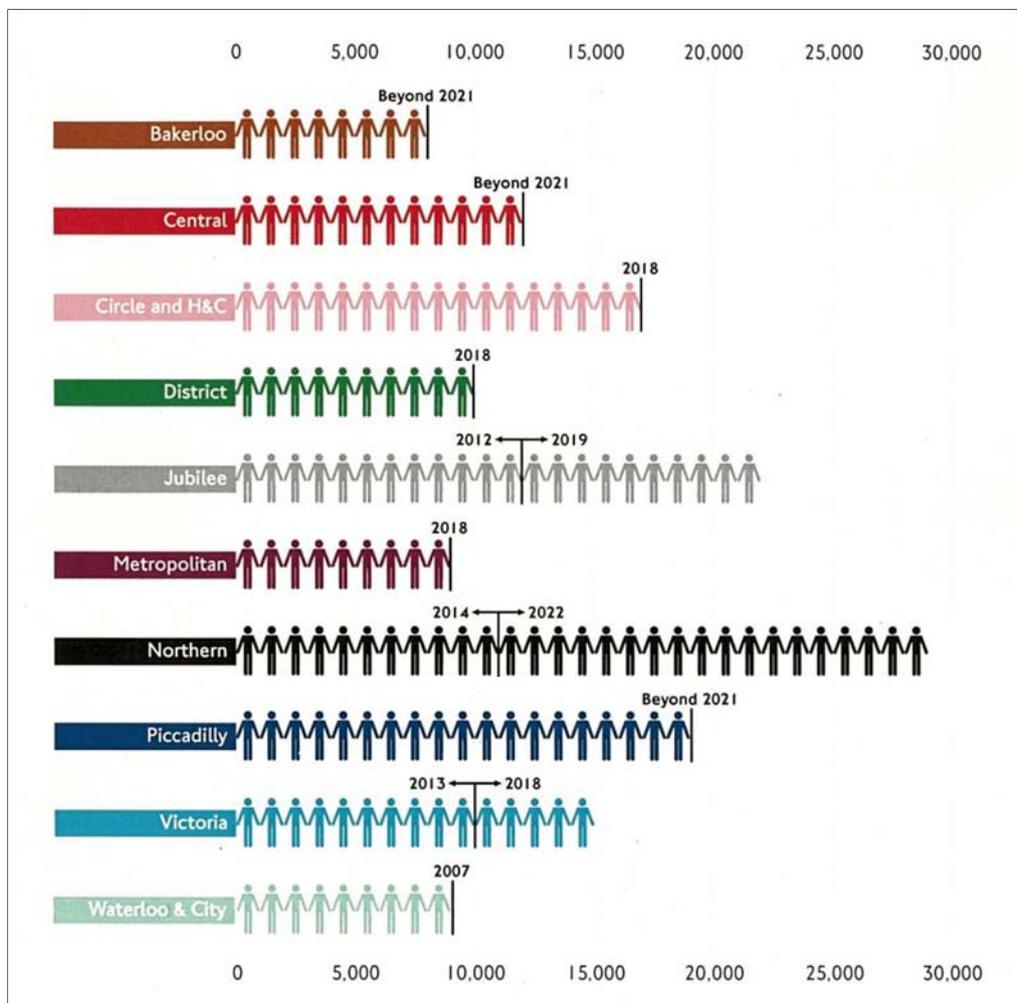


Fig. 5 Additional peak hour Underground capacity since 2006 (Source: TfL Business Plan 2014)

43. Underground capacity is and will be an issue for Government and TfL irrespective of HS2. The TfL Business Plan sets out the schemes to address this growth over the next ten years (See Fig. 5). On the Northern and Victoria lines major capacity enhancements have been implemented since 2006, in each case for over 10,000 additional peak

passengers. Further enhancements are planned on both these lines in the next few years. Current rolling stock and signalling programmes will increase capacity on the Circle and Hammersmith and City lines by 65% and by 27% on the Metropolitan Line. Similar projects have enhanced the Bakerloo and Jubilee lines and more are planned.¹²

The longer term

44. At some point the opportunities for increasing capacity on existing lines will be exhausted and if demand continues to grow between now and the middle of the century, new lines such as Crossrail 2 will be considered. The policies and proposals for addressing Underground capacity in the longer term are set out in Chapter 6 of the London Plan. The rationale for promoting Crossrail 2 is explained in paragraph 6.18 of the London Plan:

‘Despite the committed investment in London’s Underground and National Rail network (such as Crossrail and Thameslink), forecast demand shows that crowding and congestion remains a significant issue along the northeast to southwest corridor across central London. To help to address this, a route for a new line, commonly known as the Chelsea Hackney Line (and now referred to as Crossrail 2) has been safeguarded across London. It is essential that this safeguarding remains in place to protect this important new line, which would provide significant new rail capacity and congestion relief to existing rail and Tube lines.’

45. Any decision to implement Crossrail 2 is some years away and will depend, amongst other things, on the business case for whatever specific scheme is proposed and on Underground capacity and the forecasts for crowding at the time, including the effects of an HS2 terminus at Euston. Crossrail 2 will not be justified just in order to provide for onward dispersal of HS2 passengers from Euston. However, assuming Crossrail 2 is necessary, as is currently envisaged, the step change in capacity at Euston that it would provide will serve the additional demand created by Phase 2 of HS2.

46. Thus the medium and long term implications for onward dispersal of HS2 passengers at Euston have been thought through and are addressed in the context of a comprehensive approach transport provision in London both in the London Plan and the TfL Business Plan. No such planning framework for dispersal of HS2 passengers exists for a terminus at Old Oak Common, and it is difficult to see what it could comprise short of a new east-west railway in addition to the Central Line and Crossrail 1.

47. The Proposed Scheme is also integrated into the London Plan economic development and regeneration proposals. Both Old Oak Common and Euston are ‘Opportunity Areas’ designated for major development and regeneration. The proposals for both areas are supported by, and dependent on, the HS2 proposals for a terminus at Euston and an interchange station at Old Oak Common. In the case of Old Oak Common, the potential would not be enhanced by making the station the main terminus for HS2 and would be compromised by the larger footprint for the station and the crowding pressure on Crossrail.

¹² Transport for London Business Plan 2014, p.30-31