

Appraisal Framework Module 4.
Surface Access: HS2 spur to Heathrow Airport

FINAL FOR CONSULTATION

AIRPORTS COMMISSION

28th October 2014



Document Control Sheet

Project:	Appraisal Framework Module 4.
Client:	Airports Commission
Document title:	Surface Access: HS2 spur to Heathrow Airport
Project No:	B1988000

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DATE	July 2014	Document status:	DRAFT

Revision 1	Originated by	Checked by	Reviewed by
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DATE	October 2014	Document status :	FINAL

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1. Introduction

1.1 Background

- 1.1.1 The Airports Commission (AC) was established in 2012 by the UK Government to examine the need for additional UK airport capacity and to recommend how any additional capacity requirements can be met in the short, medium and long term. The Commission is due to submit a Final Report to the UK Government by summer 2015 assessing the environmental, economic and social costs and benefits of various solutions to increase airport capacity, considering operational, commercial and technical viability.
- 1.1.2 A key milestone in the AC's operational life was the delivery in December 2013 of an Interim Report. Following a general call for evidence, the Interim Report detailed the results of analysis of the capacity implications of forecast growth in UK aviation demand and a preliminary appraisal on a long-list of proposals put forward by scheme promoters to address the UK's long-term aviation connectivity and capacity needs – this work is described as Phase 1. The associated appraisal process identified three short-listed options, two focussed on expanding Heathrow Airport and one on expanding Gatwick. These short-listed options were to be further developed and appraised during Phase 2, with further phases of work programmed in the run-up to the submission of the Final Report in the summer of 2015.
- 1.1.3 Shortly after its inception, the AC issued tenders for support contracts to engage independent technical advice on a range of aspects of the Commission's work. Jacobs together with sub-consultants Leigh Fisher and Bickerdike Allen Partners were appointed as the sole supplier on the Airport Operations, Logistics and Engineering Support Contract (ref: RM1082), which runs throughout the AC's lifespan up until the summer of 2015.

1.2 HS2 spur to Heathrow Airport – scope of assessment

- 1.2.1 Under the terms of the RM1082 support contract, Jacobs were commissioned to undertake a high-level review of the implications of a HS2 spur on surface access to Heathrow Airport, as part of the wider Phase 2 surface access assessment of the short-listed expansion options.
- 1.2.2 HS2 is a proposed new high speed rail link to be delivered in two phases. The Government has deposited a hybrid Bill with Parliament for Phase 1, which will secure the powers to construct and maintain the link between London Euston and the West Midlands via Old Oak Common. The published completion date for Phase 1 is 2026. Phase 2, which is still under development, extends the route to Manchester and Leeds with links to the West Coast Main Line south of Preston and the East Coast Main Line south of York with a working assumption of services commencing in 2033. The Government has also asked HS2 to examine ways to speed up services to Scotland.¹ The original remit for Phase 2 included a high speed spur to Heathrow Airport. This option arose when in 2010 Lord Mawhinney was asked by the then Secretary of State to undertake a review of high speed rail access to Heathrow Airport. Lord Mawhinney made a number of recommendations including:
- that, in the early stages of a high speed rail network, there is no compelling case for a direct high speed rail link to Heathrow, and that a London-Old Oak Common interchange could provide an appropriate, good quality terminus and connection point to the airport;
 - that changing the route of the main high speed line to run via Heathrow, at an additional cost of £2 to £4 billion, is not likely to represent value for money to the taxpayer or the train operator – in any event, such a route is not supported by the evidence of benefits;

¹ HS2 Ltd remit of 27 June 2013 <http://assets.hs2.org.uk/sites/default/files/inserts/HS2%20Ltd%20remit%20110112.pdf> – accessed 1/7/2015

- as the high speed network is extended beyond Birmingham, the case for a more direct high speed rail link to Heathrow becomes more persuasive – as the network expands, and over time, it may make a direct high speed rail connection to Heathrow in addition to an airport connection to Old Oak Common, more viable and economically attractive;
- the preferred site for a Heathrow high speed rail station would be at the Central Terminal Area, which would complicate the engineering, but be of maximum utility to the maximum number of travellers – rapid links to all terminals by automated people movers should be provided².

1.2.3 However, the Government's appointment of the independent AC to recommend options for maintaining the country's status as an international aviation hub led it to take the decision to pause work on the spur to Heathrow until after 2015 when it expects the AC to publish its final report.

² High Speed Rail Access to Heathrow A Report to the Secretary of State for Transport by Rt Hon the Lord Mawhinney Kt
<http://webarchive.nationalarchives.gov.uk/20100803103135/http://www.dft.gov.uk/pgr/rail/pi/highspeedrail/lordmawhinneyreport/pdf/highspeedrailaccessheathrow.pdf> - accessed 1/7/2015

2. Assessment

2.1 Proposed service patterns and patronage

- 2.1.1 Before the work on the HS2 spur was paused, analysis was undertaken by HS2 into the possible level of patronage and service levels projected to use the link. These were published in 2012³ and showed projected passenger numbers using Heathrow Airport in Phase 1 via the interchange at Old Oak Common and with the direct link via a spur in Phase 2.
- 2.1.2 The Phase 2 modelling results were based on a proposed service pattern consisting of one train an hour from Leeds, (serving south Yorkshire and the East Midlands) and one an hour from Manchester through to Heathrow. Both trains would call at Birmingham Interchange but there would be no through service from central Birmingham to Heathrow and only two high speed trains an hour from central Birmingham to Birmingham Interchange⁴.
- 2.1.3 The projected passenger numbers for 2037 showed that under the Phase 1 scenario, 1,100 HS2 passengers would start or end their journey at Heathrow using the interchange at Old Oak Common. For the same date but for the Phase 2 scenario this would increase to 6,500 but of these only 2,000 were projected to be using the airport. An HS2 station at Heathrow would attract additional non-airport passengers from west London.
- 2.1.4 To put these numbers into context the same modelling assessment for Phase 2 projected a daily transfer of 6,200 domestic air passengers to HS2 at the same date (it should be noted that the latest economic case for HS2 produced in 2013 suggested that mode shift from air to rail would be 1% which equates to approximately 2,300 passengers a day⁵).

2.2 Present distribution of Heathrow passengers

- 2.2.1 The CAA 2012 passenger survey data shows that Greater London is the dominant market for Heathrow, accounting for 51.5% of its passengers (excluding interlining passengers). In total nearly 93% of Heathrow's passengers travel to and from regions of the UK that would not be served by HS2. At present, 1.3% of Heathrow's passengers are from the West Midlands, 0.7% from Nottingham and Derby, 0.4% from West Yorkshire, and 0.2% each from Greater Manchester and South Yorkshire. In addition, some 800,000 passengers fly between Heathrow and Manchester each year⁶. Virgin Trains claim that in 2004, it had one-third of the air/rail market between Manchester and London, which by 2010 had grown to more than 80%⁷. A significant proportion of remaining passengers are interlining.
- 2.2.2 In total around 2m of Heathrow's passengers presently travel to and from regions that will have direct high speed rail services. However, this still equates to less than 3,000 passengers a day travelling in each direction.

2.3 HS2 spur proposals highlighted by Heathrow Hub Ltd (HH) and Heathrow Airport Ltd (HAL)

- 2.3.1 The submissions from both these scheme promoters make it clear that they are not dependent on HS2 serving the airport and expect few passengers to use such a service.

³ Demand and Appraisal Report HS2 London - West Midlands Report for HS2 Ltd MVA Consultancy, In Association With Mott MacDonald and Atkins April 2012

⁴ Updated economic case for HS2 (August 2012): Explanation of the service patterns January 2013
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/244033/Updated_economic_case_for_HS2_August_2012_-_Explanation_of_the_service_patterns_January_2013.pdf - accessed 2/7/2015

⁵ The economic case for HS2 http://assets.hs2.org.uk/sites/default/files/inserts/S%26A%201_Economic%20case_0.pdf accessed 8/7/2015

⁶ CAA Domestic route passenger analysis 2013

⁷ Virgin Rail Welcome to our world http://www.virginrailgroup.co.uk/eng/brochure/VRG_international.pdf accessed 15 July 2014.

HH submission

- 2.3.2 The HH proposals do not include a HS2 spur to Heathrow and are based on the present plans for an interchange station at Old Oak Common. The submission indicates that, *“whilst it is possible that a spur will be built from HS2 to Heathrow as part of Phase 2 of the HS2 project, this is far from committed, but could be accommodated by our proposals. In addition, the spur would face the same problems as WRAtH [Western Rail Access to Heathrow] – train loadings would be low, as it would only be used by Heathrow passengers, and there would be a major opportunity cost, as Heathrow trains would reduce the number of HS2 services to Euston on a one-for-one basis. Even a two trains per hour service, assuming half trainsets, would provide ca 1100 seats per hour in both directions – a capacity equivalent to two A380 aircraft each and every hour to a very limited range of UK regional cities (and with very poor onward connections to the classic rail network at Birmingham, Sheffield, Leeds and East Midlands where HS2 stations are located some distance from existing railheads)”*⁸.
- 2.3.3 The HH preference is for through high speed rail services rather than having a spur⁹. This would be part of a much larger rail network serving the hub and providing both rail-to-rail and rail-to-air interchange.

HAL submission

- 2.3.4 HAL's submission is not dependent on a high speed rail link but it supports the idea, stating that, *“in 2026, high speed rail services will commence between London and Birmingham. Heathrow will be served by a connection at Old Oak Common. Frequent Heathrow Express and Crossrail services will connect Heathrow to Old Oak Common with a journey time of around ten minutes (by Heathrow Express) and a train to Heathrow every 5-6 minutes. It will be particularly important to ensure that the station at Old Oak Common allows easy interchange for airport passengers between high speed and airport rail services.*
- 2.3.5 *For the purpose of our core assessment we have assumed a connection to the high speed network via Old Oak Common. We have also safeguarded a station at Heathrow West in line with HS2 Ltd plans. Connecting to the new high speed network via Old Oak common will significantly cut journey and avoiding multiple interchanges through London.*
- 2.3.6 *Current Government policy is for a spur to Heathrow to be delivered as part of Phase 2 by 2032. Whilst the spur is not critical to our strategy for growth, we believe there is a strategic case to integrate the high speed rail network with Heathrow. This is in line with international best practice at airports around the world and supported by policy at European level, which sets out that all main European airports should be on the high speed rail network by 2050.*
- 2.3.7 *A recent review of the HS2 project by Sir David Higgins identified a number of opportunities, including the potential to bring forward Phase 2 and increase the benefits by connecting HS2 to rail hubs in the North, such as Crewe.*
- 2.3.8 *Heathrow could provide similar opportunities for wider connectivity in the South, particularly when taking into account the opportunities to interchange onto Western Rail Access and Southern Rail Access.*
- 2.3.9 *We will continue to work with DfT and HS2 Ltd to identify the optimum solution for providing fast, frequent connectivity between the North of England and Scotland and Heathrow”*¹⁰.

⁸ Heathrow Expansion Updated scheme design - Surface Access Development Strategy submitted to the AC by Runway Innovations Ltd and Heathrow Hub Ltd

⁹ See for example Heathrow Hub evidence to Transport Select Committee <http://www.publications.parliament.uk/pa/cm201012/cmselect/cmtran/1185/1185vw135.htm> accessed 15th July 2014.

¹⁰ Taking Britain further Heathrow's plan for connecting the UK to growth

3. Conclusions

3.1 Proposed service patterns and patronage

Costs and benefits of HS2 spur

- 3.1.1 Providing a grade-separated junction, a spur from the main HS2 line to Heathrow and a station at Heathrow was estimated by HS2 to cost £1.8-1.9bn¹¹ in 2012. The spur could in theory (if operated 18 hours a day with 400m trains) accommodate around 28m passengers a year (a more reasonable figure would be around 10m with a train occupancy rate of 35%).
- 3.1.2 If passenger numbers at Heathrow doubled with all markets served in the same proportion as now, this would mean 4m passengers travelling to and from Heathrow from those areas served by HS2. To make effective use of HS2's capacity a further 2.5-fold increase in passenger numbers from these regions would be required (based on the unrealistic assumption that all the initial 4m passengers transferred to HS2).
- 3.1.3 Based on the evidence seen to date it is difficult to envisage the provision of a spur from HS2 to Heathrow will either have a material impact on passenger numbers at Heathrow or be a good use of scarce capacity on HS2 itself when there are so many competing uses for these paths.

¹¹ DfT correspondence https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/8725/dft-e0008892.pdf - accessed 15th July 2014