



# HIGH SPEED TWO PHASE ONE INFORMATION PAPER

## F1: ROLLING STOCK DEPOT AND STABLING STRATEGY

This paper outlines the reasons for the proposed depot and stabling strategy for the HS2 passenger rolling stock.

It will be of particular interest to those potentially affected by the Government's proposals for high speed rail.

This paper was prepared in relation to the promotion of the Bill for Phase One of the scheme which is now enacted. Although the contents were maintained and updated as considered appropriate during the passage of the Bill (including shortly prior to the enactment of the Bill in February 2017) the contents are now historic and are no longer maintained.

If you have any queries about this paper or about how it might apply to you, please contact the HS2 Helpdesk in the first instance.

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# F1: ROLLING STOCK DEPOT AND STABLING STRATEGY

## 1. Introduction

- 1.1. High Speed Two (HS2) is the Government's proposal for a new, high speed north-south railway. The proposal is being taken forward in two phases: Phase One will connect London with Birmingham and the West Midlands and Phase Two will extend the route to Manchester, Leeds and beyond.
- 1.2. HS2 Ltd is the non-departmental public body responsible for developing and promoting these proposals. The company works to a Development Agreement made with the Secretary of State for Transport.
- 1.3. In November 2013, HS2 Ltd deposited a hybrid Bill<sup>1</sup> with Parliament to seek powers for the construction and operation of Phase One of HS2 (sometimes referred to as 'the Proposed Scheme'). The Bill is the culmination of nearly six years of work, including an Environmental Impact Assessment (EIA), the results of which were reported in an Environmental Statement (ES) submitted alongside the Bill. The Secretary of State has also published draft Environmental Minimum Requirements (EMRs), which set out the environmental and sustainability commitments that will be observed in the construction of the Proposed Scheme.
- 1.4. The Bill is being promoted through Parliament by the Secretary of State for Transport (the 'Promoter'). The Secretary of State will also appoint a body responsible for delivering the Proposed Scheme under the powers granted by the Bill.
- 1.5. This body is known as the 'nominated undertaker'. There may well be more than one nominated undertaker – for example, HS2 Ltd could become the nominated undertaker for the main railway works, while Network Rail could become the nominated undertaker for works to an existing station such as Euston. But whoever they are, all nominated undertakers will be bound by the obligations contained in the Bill and the policies established in the EMRs.
- 1.6. These information papers have been produced to explain the commitments made in the Bill and the EMRs and how they will be applied to the design and construction of the Proposed Scheme. They also provide information about the Proposed Scheme itself, the powers contained in the Bill and how particular decisions about the project have been reached.

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<sup>1</sup>The High Speed Rail (London – West Midlands) Bill, hereafter 'the Bill'.

## 2. Rolling stock depots and stabling

- 2.1. In order to operate HS2 passenger trains (rolling stock) safely and efficiently, it is necessary to provide facilities at which the trains can be maintained, serviced and stored (stabled) when not in use.
- 2.2. This Information Paper sets out the proposed depot and stabling strategy for HS2's rolling stock, including an overview of the requirements associated with the Rolling Stock Maintenance Depot (RSMD) facility, the justification for its location and site layout, and the steps which have been taken to mitigate the effects of the facility's construction and operation on local residents.

## 3. The rolling stock fleet

- 3.1. It is envisaged that passenger train services on HS2 will be provided by two new, dedicated fleets of high-speed trains.
- 3.2. The 'captive' train fleet will remain entirely on the new high-speed network and will not operate on the existing classic rail network. These trains are expected to be similar in size and characteristics to the latest high speed trains introduced in Europe.
- 3.3. The 'classic compatible' train fleet will have the same capability as the captive fleet such as speed, acceleration and passenger capacity, but will be slightly smaller (in width and height) to allow them to operate on the existing UK rail network beyond the new Phase One line to destinations such as Liverpool, Manchester and Glasgow.
- 3.4. Both types of train will be 200 metres (m) in length, but on some services, two trains will be coupled together to provide a 400m train with up to 1,100 seats.
- 3.5. It is currently anticipated that approximately 60 new 200m long high speed trains will be required to operate the Phase One passenger services, with approximately three quarters of these being classic compatible trains and the remainder being captive trains.

## 4. Depot and stabling strategy

- 4.1. The depot and stabling strategy has been developed to ensure that trains are maintained, serviced and operated efficiently when in use.
- 4.2. As a significant number of new trains will be introduced, additional train maintenance capacity will be required, as will facilities for train servicing (cleaning, water replenishment etc.) and stabling. These need to be located in areas near where trains will enter and leave service operation, therefore avoiding unnecessary, costly train movements.
- 4.3. Phase One will therefore require the construction of a new RSMD connected to the high speed network, as well as the use of railway stations and existing depot facilities for the stabling and servicing of trains.

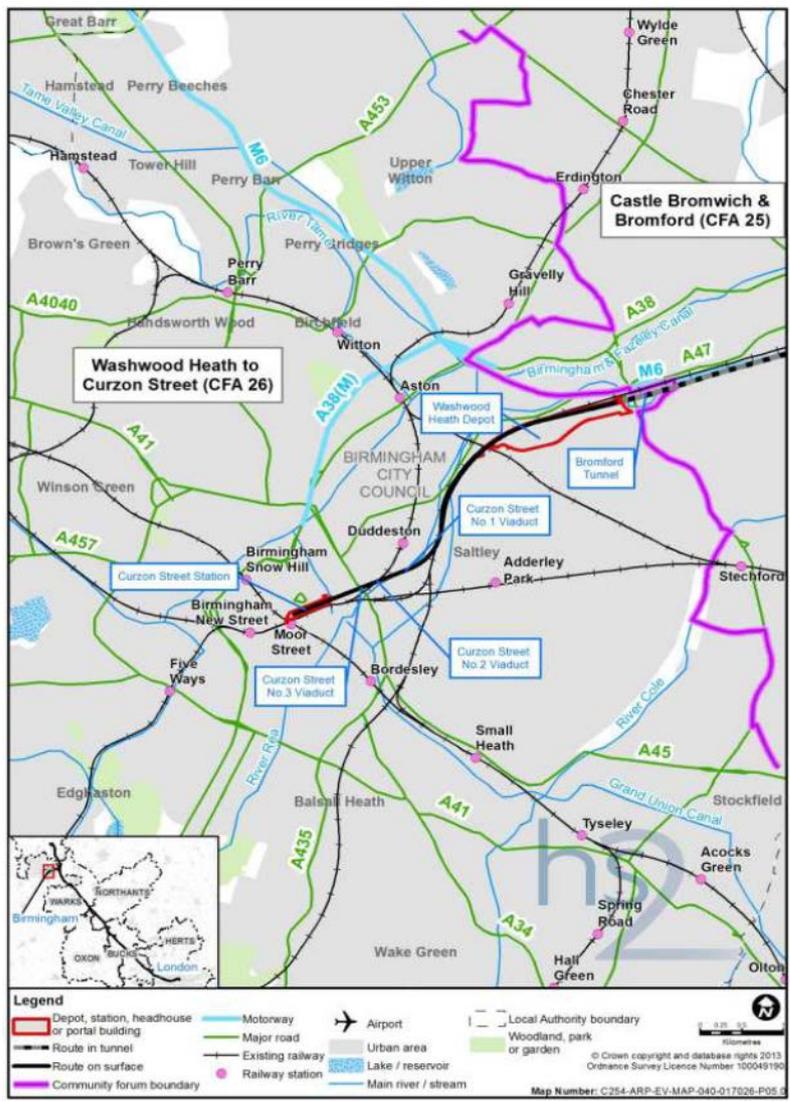
- 4.4. Having considered where train services will begin and end each day and assessing the available stabling capacity on the UK rail network, it is proposed that a number of HS2 trains be stabled each night at existing depots. Depots such as Edge Hill in Liverpool, Longsight in Manchester, and Polmadie in Glasgow are possible sites for this purpose. Some light maintenance may also be carried out at these locations, subject to the final fleet maintenance strategy.
- 4.5. To support the efficient start and end of operations in the London area, trains will also be stabled at Euston station, where a reduced servicing regime will take place. This would typically involve interior cleaning only.
- 4.6. The remaining trains will be stabled at the new RSMD, which will be located at Washwood Heath in Birmingham.
- 4.7. Additional new depot facilities are proposed as part of Phase Two of the scheme, but the overall strategy is yet to be developed. However, Phase Two facilities are expected to be similar, albeit somewhat smaller, to the RSMD proposed for Phase One. This is because the Phase One RSMD will be able to support Phase Two operation, given its location.

## 5. New depot location

- 5.1. The Phase One RSMD at Washwood Heath was identified as the preferred site in 2009. This site is situated to the south of the HS2 line of route, approximately 4km to the northeast of Birmingham city centre and alongside the Heartlands Spine Road (A47) and M6 (the site location is shown in Figure 1).
- 5.2. The functional requirements established for the RSMD were used to assess the suitability of potential sites and ensure that the selection process reflected the need to eliminate unsuitable sites before consideration on environmental or engineering grounds. The functional requirements are based on analysis of existing depots and how they are operated.
- 5.3. It is essential that the new RSMD is directly connected to the high speed network so that it can be accessed by both captive and classic compatible trains. Captive trains will not be able to operate on the existing UK rail network due to their larger height and width.
- 5.4. An initial assessment was carried out to determine the preferred geographic area for the site. Given the need for the location to be close to a station where a large number of trains are starting and ending service, two options were considered: London and the West Midlands. London was eliminated on the grounds of there being limited potential sites, a lack of the required skilled labour and the fact that it is at the extreme end of the network.
- 5.5. A review of potential locations in the West Midlands led to a shortlist of four locations: Washwood Heath; the Elmdon Land Rover site; and two greenfield sites at Berkswell and Middleton. Discussions with stakeholders led to the identification of one additional greenfield site in Coleshill, North Warwickshire.

- 5.6. Based on further evaluation using technical and environmental criteria, Washwood Heath was rated the highest of the five options (it was also determined that the Elmdon site could not be made available to HS2). As a brownfield site, Washwood Heath performed significantly better than the three greenfield locations against criteria such as the protection of natural resources and, specifically, the optimal use of land resource.
- 5.7. Following further engagement with stakeholders, the decision regarding the location was revisited in 2012/2013. This process confirmed that the sites previously considered and eliminated remained unsuitable, but further consideration was given to the suitability of a new site near Birmingham Airport. However, this site was eliminated on the grounds that a complex and costly design would be needed to support the RSMD operational requirements. The site had also been identified for development in accordance with Solihull Metropolitan Borough Council's growth and development aspirations. Other new sites were also considered, but all were ruled out on technical and environmental grounds.
- 5.8. On the basis of the process undertaken in 2009, and the subsequent alternative sites review, Washwood Heath remained the preferred location for a Phase One RSMD. The main positive points around this location are that it is:
- a brownfield site;
  - near the classic network;
  - of sufficient size;
  - near Birmingham Curzon Street; and
  - in proximity to a local workforce.

Figure 1: Location of Washwood Heath RSMD on a map.



Source: ES Volume 2 CFA report CHA26 - Washwood Heath to Curzon Street.

## 6. Depot site layout

- 6.1. A full functional specification has been developed to inform the initial design of the RSMD, including the facilities to be provided on the site within the layout constraints.
- 6.2. An initial site layout was proposed as part of the post-consultation route announcement in January 2012. During 2012 and 2013, the layout was revised to improve the site and to make the most efficient use of the land available, while leaving as much land as practicable for future development.
- 6.3. Layout options were also explored to try and reduce the effect of the depot on existing businesses operating on the Washwood Heath site, in particular the UK

Mail distribution centre. However, due to the wider railway design developing to include the Bromford tunnel, which has its west portal at the edge of the Washwood Heath site, mitigating the effects on UK Mail was deemed impractical. An agreement has therefore been reached with UK Mail and the business is to relocate to the Coventry area.

- 6.4. When both Phase One and Phase Two of the scheme are operational, Washwood Heath will be required to stable up to 40 200m trains at any time. The stabling tracks will be 400m long, allowing two trains to be stabled on each track. Therefore, a total of 20 stabling tracks are included in the initial design.
- 6.5. In addition to the stabling tracks, 12 rolling stock maintenance tracks (suitable for 200m trains) are required, located within a maintenance shed. This building will be the largest on the site, with dimensions of approximately 250m long, 120m wide and 14m high.
- 6.6. The depot will include two rolling stock washing facilities for cleaning the exterior of trains as they enter or exit the depot.
- 6.7. Wheel lathes will be provided for conditioning the wheels of the trains. These require dedicated tracks that allow the lathe to condition the wheels on a train from beneath it.
- 6.8. The site footprint includes space for ancillary buildings, vehicle parking, bicycle parking and public transport access.
- 6.9. The HS2 network control centre will also be located on the Washwood Heath site. This will include control rooms from which the operation of the railway will be managed, as well as facilities such as training rooms and simulators for the operations and train staff.
- 6.10. These factors have led to the need for a level site with a footprint of approximately 2,000 metres by 500 metres.
- 6.11. The majority of trains will enter and exit the site to the west in the direction of Curzon Street station. Two 1km access tracks connecting to the HS2 line are therefore provided at this end of the depot.
- 6.12. There is an additional 850m, east-facing entrance track to allow for the occasional entry and exit of trains from and to locations other than Birmingham.
- 6.13. A landscape and local habitat planting strip will be provided along the southern side of the site, which will include native trees, shrubs and grassland. Features such as ecologically designed brown roofs which may be partially or fully covered in vegetation for ecological benefits, will also be considered.

## **7. Depot operations**

- 7.1. The Washwood Heath depot will operate throughout the day and night, but the majority of operations will occur during the night.

- 7.2. Passenger trains will be prepared and dispatched to Curzon Street station from approximately 05:00, before passenger services start each day at approximately 05:30. Trains will return to Washwood Heath depot during the evening as passenger services decrease on the operational railway, with the last train expected to arrive back at the RSMD at approximately 00:30.
- 7.3. Train maintenance will be carried out almost exclusively within the maintenance shed.
- 7.4. The site will be designed to reduce noise effects for people adjacent to the site as far as reasonably practicable.
- 7.5. The main sources of noise are likely to be trains entering and leaving the site, trains moving between the stabling tracks and the maintenance shed and maintenance work taking place within the maintenance shed or on the wheel lathe.
- 7.6. The RSMD design addresses this in part by locating noisy activities such as the wheel lathe and the stabling tracks to the north of the site, away from residential properties.
- 7.7. Further mitigation will include: limiting the sounding of train horns; controlling noise from train movements along tracks; controlling train equipment such as air-conditioning units while trains are stabled; controlling noise from maintenance and cleaning through the design of the maintenance sheds; creating enclosures for the train washing and wheel lathe facilities; and reducing noise with boundary barriers as necessary.
- 7.8. The site layout uses existing topography and new planting to create natural noise barriers along the southern boundary, which is in closest proximity to residential properties. The mitigation measures will reduce noise such that it will not reach a level where it would significantly affect residents.
- 7.9. We have also sought to reduce light pollution as far as reasonably practicable. The depot site will be lit using low level lighting with shielding wherever possible in order to minimise the amount of light escaping. Where required for technical and safety reasons, e.g. in areas with train movements, high mast lighting will be used.
- 7.10. More detailed design will be carried out as the scheme progresses, taking into account any changes to the operational regime or maintenance practises between now and opening. In line with the planning regime set out in the Bill, the design and external appearance of the depot will be subject to the approval of the local planning authority.

## **8. Employment at Washwood Heath**

- 8.1. It is anticipated that up to 650 people will be employed at the Washwood Heath site. This includes around 500 people involved in train maintenance, 100 in the

HS2 network control centre and around 50 train drivers who will start and end their shifts at the depot.

## **9. More information**

- 9.1. More detail on the Bill and related documents can be found at: [www.gov.uk/HS2](http://www.gov.uk/HS2)