

HS2

Infrastructure maintenance and rail systems construction facilities

This factsheet provides information regarding the emerging proposals for the temporary rail systems construction facilities (railheads) and permanent infrastructure maintenance base-rail facilities (IMB-Rs) required for the Proposed Scheme.

Version 1.0

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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 phases: Phase One will connect London with Birmingham and the West Midlands. Phase 2a will extend the route to Crewe. Phase 2b will extend the route to Manchester, Leeds and beyond (the 'Proposed Scheme').
- 1.2 The construction and operation of Phase One of HS2 is authorised by the High Speed Rail (London – West Midlands) Act (2017). In July 2017, the Government introduced a hybrid Bill to Parliament to seek powers for the construction and operation of Phase 2a. A hybrid Bill to seek powers for the construction and operation of Phase 2b is expected to be introduced to Parliament in 2020.
- 1.3 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.
- 1.4 The work to produce the Phase 2b Bill will include an Environmental Impact Assessment (EIA), the results of which will then be reported in an Environmental Statement (ES). The ES would be submitted alongside the Phase 2b Bill when it is introduced to Parliament. The emerging findings of the EIA were reported in a working draft Environmental Statement (WDES)¹ that was consulted on in late 2018.
- 1.5 As was the case with Phase One and Phase 2a, when the Phase 2b Bill is introduced to Parliament, the Secretary of State will also publish draft Environmental Minimum Requirements (EMRs). The EMRs will set out the environmental and sustainability commitments that will be observed in the construction and operation of Phase 2b.
- 1.6 A series of information papers were produced for the Phase One and Phase 2a hybrid Bills, explaining the commitments made in those Bills and EMRs. It is the Secretary of State's intention to follow a similar process for the Phase 2b Bill. These information papers for Phase 2b will be used to provide information about Phase 2b itself, the powers contained in the Phase 2b Bill when it is introduced to Parliament and how decisions on Phase 2b have been reached. It

¹ The WDES presented draft environmental information based on a stage in the ongoing design and assessment process for the Proposed Scheme. It included a description of the existing environment; an evaluation of the anticipated environmental impacts of the Proposed Scheme; and the measures being proposed at the time to manage the anticipated impacts. The ES submitted alongside the hybrid Bill will reflect any changes made following further work on the design and EIA, the WDES consultation, and any further consultation on the Proposed Scheme.

is currently proposed that these information papers for Phase 2b will be published at the time the Phase 2b Bill is introduced in Parliament.

- 1.7 The Secretary of State for Transport will be ‘the Promoter’ of the Phase 2b Bill. The Promoter will also eventually appoint a body responsible for delivering the Proposed Scheme under the powers to be granted by the Phase 2b Bill. This body will be known as the ‘nominated undertaker’. There may well be more than one nominated undertaker. However, any and all nominated undertakers will be bound by the obligations contained in the Phase 2b Bill, the policies established in the Phase 2b EMRs and any commitments provided in the Phase 2b information papers.
- 1.8 These Phase 2b Factsheets have been produced to provide information on the emerging proposals for measures to manage the design process for Phase 2b and to control impacts which may arise from the construction and operation of the Proposed Scheme. These measures may then be applied to Phase 2b as commitments made through the eventual Phase 2b Bill, EMRs or information papers.

2 Overview

- 2.1.1 This factsheet provides information regarding the emerging proposals for the temporary rail systems construction facilities (railheads) and permanent infrastructure maintenance base-rail facilities (IMB-Rs) required for the Proposed Scheme. It includes:
- an overview of the likely strategy associated with the temporary construction facilities for rail systems: the ‘railheads’; and
 - an overview of the likely strategy associated with the IMB-Rs.
- 2.1.2 Facilities to maintain or stable HS2 passenger rolling stock are not covered in this factsheet. For further information on these facilities, see the Phase 2b Factsheet: Depots.

3 Rail systems construction strategy

- 3.1.1 Rail systems installation would start after the civil engineering installation of structures, earthworks and tunnels for the Proposed Scheme is complete. Rail systems elements include track laying, overhead line equipment, and signalling and communications equipment installation, testing and commissioning.

3.2 The need for railheads

- 3.2.1 To construct the rail systems elements of the Proposed Scheme, temporary construction facilities connected to the conventional railway and the proposed route would be required. These are known as 'railheads'.
- 3.2.2 A connection to the conventional railway is essential because certain rail systems materials, such as rail, cannot reasonably be delivered by road.
- 3.2.3 Other rail systems materials, such as aggregates, overhead line equipment and cables could be delivered by road, but given the quantum of such materials, it would be beneficial to deliver these by rail where possible to reduce the volume of construction vehicles using the public road network.

3.3 Overview of railhead requirements

- 3.3.1 A railhead would usually act as the main construction compound for managing the rail systems installation and would need to have the space and facilities to be able to receive, handle and store enough materials to maintain an efficient rail systems installation programme.
- 3.3.2 Rail systems installation would be generally carried out in a 'linear' manner, working away from the railhead, using newly installed track to deliver materials further along the route. This limits the efficient range of the railhead to a distance of up to approximately 50km (based on the experience of other high speed rail projects). The exact requirement for the number and location of railheads is subject to the configuration and technical specification of the railway.
- 3.3.3 A railhead has several core functional requirements, such as:
- connection to the conventional railway network to a line that can accommodate freight trains to deliver and remove material;
 - good connection to the road network;
 - connection, preferably in both directions, to the main line; and
 - suitable space to load and unload trains as well as to store plant, trains and materials.
- 3.3.4 The above points are all critical in terms of considering the optimum location for a temporary railhead or the railheads that would be used for the Proposed Scheme.
- 3.3.5 The locations of the proposed temporary construction railheads for the Proposed Scheme will be reported in the Phase 2b formal Environmental Statement. These locations will be informed by further design development

work, the Phase 2b WDES consultation in 2018 and the Phase 2b Design Refinement Consultation in 2019. Locations will be chosen that give the railway systems programme the required flexibility to construct from multiple fronts.

4 Infrastructure maintenance strategy

4.1 Types of maintenance

4.1.1 Maintenance is the general day-to-day upkeep of the railway that keeps trains running. It is expected to consist of:

- preventative maintenance to keep things working at their optimum level;
- predictive maintenance to address issues with equipment before it fails; and
- corrective maintenance to repair or replace elements once they have failed.

4.1.2 HS2 Ltd.'s infrastructure maintenance strategy is expected to involve undertaking a programme of preventative and predictive maintenance by gathering and analysing real-time information about the condition of all elements of HS2 infrastructure, to avoid corrective maintenance as far as possible.

4.1.3 This condition-monitoring information would be obtained by:

- using active monitoring systems on passenger trains;
- running dedicated inspection trains with on-board specialised measuring equipment;
- using automated fixed monitoring systems on the elements themselves (track controlling systems, security systems, fire detectors etc.) that flag up the need for additional maintenance before they fail; and
- utilising maintenance teams to conduct on-site inspections.

4.2 Maintenance timing and facility positioning

4.2.1 It is expected that on-site inspection work and the majority of maintenance work itself would normally be carried out along the route at night, once passenger train services are no longer operating. Passenger services are expected to operate between 05:00 and 00:00 from Monday to Saturday and between 08:00 and 00:00 on Sunday.

4.2.2 When and where urgent corrective maintenance is required, work would be undertaken to return the train service to normal.

4.2.3 With this in mind, positioning maintenance teams and equipment at appropriate locations where they can reach the whole route safely and quickly, would allow preventative, predictive and corrective maintenance to be carried out with minimum disruption to train services and with maximum efficiency.

4.3 Maintenance across the different phases of HS2

4.3.1 HS2 is planned to be built in phases, with maintenance facilities constructed separately on each phase. These facilities must be capable of safely, reliably and efficiently maintaining both that phase as well as interacting effectively with facilities provided on other HS2 phases.

4.3.2 The maintenance facilities provided on Phase One of HS2 will be capable of fulfilling the maintenance requirements associated with that phase, likewise with the maintenance facilities provided on Phase 2a. Once the Proposed Scheme extends the route beyond Phase One and Phase 2a of HS2, the Phase One, Phase 2a and Phase 2b maintenance facilities would interact to provide a 'maintenance system' that fulfils the route-wide maintenance requirements of all phases.

4.3.3 The IMB-R at Stone in Staffordshire, on Phase 2a of HS2, is proposed as the main maintenance facility for the western leg of Phase 2b. However, the maintenance facilities proposed on Phase One and Phase 2a of HS2 are not sufficient to maintain the Proposed Scheme. As such, permanent maintenance facilities would be required as part of the Proposed Scheme. These would need to maintain the Phase 2b route in conjunction with the facilities provided on Phase One and Phase 2a of HS2.

4.3.4 The locations of the proposed IMB-Rs for the Proposed Scheme will be reported in the formal Environmental Statement. As with the temporary construction railheads, these locations will be informed by further design development work, the Phase 2b WDES consultation in 2018 and the Phase 2b Design Refinement Consultation in 2019.

4.4 Overview of maintenance facility requirements

4.4.1 In addition to the requirements described above, the permanent maintenance facilities have several core functional requirements, such as:

- connection to the conventional railway network to a line that can accommodate freight trains to deliver and remove materials needed to maintain HS2;
- adequate connection to the road network;
- connections to the HS2 main line; and

- suitable space to load and unload trains as well as to store plant, trains and materials.

4.4.2 The core functional requirements are very similar to those needed for a railhead.

5 Railhead and IMB-R sites

5.1.1 It is expected that, where practicable, materials would be delivered to each railhead and IMB-R using the existing and proposed rail network.

5.1.2 The Code of Construction Practice (CoCP) is expected to require that a route-wide Traffic Management Plan (TMP) be produced, in liaison with highway and traffic authorities and the emergency services. As appropriate, the plan would be expected to include:

- the means of managing lorry flows;
- the requirement for vehicle and driver safety;
- requirements for preparing workforce travel plans;
- the strategy for design and consultation for traffic management (including the signing strategy for emergency service access and lorry wayfinding); and
- the requirements for protecting highways.

5.1.3 Local TMPs would also be produced in liaison with highway and traffic authorities and the emergency services. As appropriate, these would be expected to include:

- contractors' construction flow assumptions;
- the local routes to be used by large goods vehicles (approved where applicable), including lorry holding areas required for construction of the Proposed Scheme; and
- significant works affecting roads and public rights of way, including temporary and permanent closures and diversions.

5.1.4 Contractors would be required to consider and, where reasonably practicable, mitigate noise generated by road-going construction traffic.

5.1.5 It is expected that construction vehicles and their impact on road safety would be managed, monitored and controlled by:

- a vehicle monitoring system, to enable contractors to provide forecast and actual movement data as well as information on safety compliance;
- vehicle flow monitoring, where there are specific restrictions on numbers of vehicles permitted to use a route;
- vehicle identification;

- driver training in vulnerable road user awareness, rural road driving and fuel efficiency;
- requirements for vehicle safety equipment and blind spot minimisation;
- the implementation of fleet operator quality schemes; and
- the implementation of route and flow monitoring, including monitoring of whether the driver and vehicle safety requirements are being met.

- 5.1.6 For more information on the Code of Construction Practice and Traffic Management Plans, see Phase 2b Factsheets: Draft Code of Construction Practice; and Management of Traffic during Construction.
- 5.1.7 As it is expected that the majority of heavy materials would arrive at the railheads and IMB-Rs by the existing and proposed rail network, rather than by road, reception sidings and a headshunt connecting Network Rail to the facilities would also be provided. Once in the railhead or IMB-R, trains carrying heavy materials would be stabled or unloaded.
- 5.1.8 It is expected that each railhead would consist of a range of buildings to suit the required construction that the railhead would support. It is likely that buildings would include welfare facilities and offices, and that car parking would also be provided.
- 5.1.9 It is expected that each IMB-R would also consist of a range of buildings and facilities, likely including storage areas, workshops, welfare facilities, offices and car parking.

6 Railhead and IMB-R operations

- 6.1.1 Each railhead is expected to be operational 24-hours a day, 7 days a week. Engineering trains would arrive and depart to suit the available train paths on the conventional rail network. The loading and unloading of engineering trains would only happen during the day.
- 6.1.2 Similarly, each IMB-R is expected to be operational 24-hours a day, 7-days-a-week.
- 6.1.3 Engineering trains would normally be prepared and teams dispatched from the IMB-R to work on the railway at around midnight each night and return before the closure of the maintenance window, at 04:59 Monday to Saturday and at 07:59 on Sunday. However, this may vary when responding to incidents and emergencies.
- 6.1.4 As described earlier, supplies would be delivered to each railhead and IMB-R via rail and road, although the majority of heavy materials would arrive by rail.

- 6.1.5 Construction, maintenance and operation of the Proposed Scheme, including the railheads and IMB-Rs, would be in accordance with environmental legislation and good practice.

7 More information

- 7.1.1 Further factsheets and details on the Proposed Scheme can be found at:
www.hs2.org.uk/phase2b