

High Speed Rail (Crewe to Manchester and West Midlands to Leeds)

Working Draft Environmental Statement

Volume 4: Off-route effects

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Department
for Transport

High Speed Two (HS2) Limited has been tasked by the Department for Transport (DfT) with managing the delivery of a new national high speed rail network. It is a non-departmental public body wholly owned by the DfT.

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Preface

The working draft Environmental Statement

This report is Volume 4 of the working draft Environmental Statement (ES) for Phase 2b of High Speed Two (HS2). The purpose of the working draft ES is to provide the public and other stakeholders with an opportunity to review and comment on preliminary environmental information for Phase 2b of HS2, which is based on a stage in the ongoing design development and environmental assessment process. Nothing included at this stage is intended to limit the form of the final scheme that will be presented in the hybrid Bill and formal ES in light of further scheme development and the ongoing discussions with stakeholders such as Transport of the North and Midlands Connect. Consultation on the working draft ES is being undertaken to help inform the ongoing design and environmental assessment in advance of producing a statutory formal ES. The formal ES will accompany the deposit of the hybrid Bill for Phase 2b of HS2.

Phase 2b comprises the section of the proposed HS2 rail network from Crewe to Manchester (and a connection onto the West Coast Main Line (WCML)) (the western leg), and from the West Midlands to Leeds (and a connection onto, and part electrification of, the Midland Main Line (MML) and a connection onto the East Coast Main Line (ECML)) via the East Midlands and South Yorkshire (the eastern leg). Collectively, this is referred to in this working draft ES as the 'Proposed Scheme'. The working draft ES describes the Proposed Scheme and reports its likely significant environmental effects and the measures proposed to mitigate those effects, based on a stage in the ongoing design and environmental assessment.

The hybrid Bill for Phase One of the HS2 network, between London and the West Midlands, was the subject of an ES deposited in November 2013, followed by ESs deposited with Additional Provisions to that Bill in 2014 and 2015. The Phase One hybrid Bill received Royal Assent in February 2017 and pre-construction work on Phase One commenced in July 2017.

The hybrid Bill for Phase 2a of the HS2 network, between the West Midlands and Crewe, was the subject of an ES deposited in July 2017, followed by a subsequent ES deposited with an Additional Provision to that Bill in March 2018. The Phase 2a Bill is expected to receive Royal Assent in 2019.

Consultation on the working draft Environmental Statement

The public has an opportunity to comment on this working draft ES. The period of public consultation is taking place during October 2018 – December 2018; the first day of the consultation period being the date the Secretary of State for Transport formally announces the consultation and the publication of the working draft ES documents on www.gov.uk/hs2

Structure of the HS2 phase 2b working draft Environmental Statement

This report is Volume 4 of the working draft ES for Phase 2b of HS2. The working draft ES describes the design of the Proposed Scheme and reports the likely significant environmental effects of the construction and operation of the Proposed Scheme and proposed mitigation and monitoring measures, based on a stage in the ongoing design and environmental assessment process. The report will be updated for the formal ES to reflect further work on the design, assessment and mitigation and monitoring measures between now and when the hybrid Bill is deposited. The structure of the working draft ES is shown in Figure 1.

This working draft ES has been prepared by persons who have sufficient expertise to ensure the completeness and technical quality of the statement.

The working draft ES comprises the following documents:

Non-technical summary

This provides a summary in non-technical language of the following, identified at a stage in the ongoing design and environmental assessment:

- the Proposed Scheme and the reasonable alternatives studied;
- the likely significant beneficial and adverse effects of the Proposed Scheme;
- the means to avoid or reduce likely significant environmental effects; and
- an outline of the monitoring measures to manage the effects of construction and the effectiveness of mitigation post construction, as well as appropriate monitoring during operation.

Glossary of terms and list of abbreviations

This contains terms and abbreviations, including units of measurement, used throughout the working draft ES.

Volume 1: Introduction and methodology

This provides:

- a description of HS2, the environmental impact assessment (EIA) process and the approach to consultation and engagement;
- details of the permanent features of the Proposed Scheme and general construction techniques, based on a stage in the ongoing design;
- a summary of the scope and methodology for the environmental topics;
- an outline of the general approach to mitigation;
- an outline of the approach to monitoring, including measures to manage the effects of construction, the effectiveness of mitigation post construction, as well as the approach to monitoring during the operational phase, based on a stage in the ongoing design; and

- a summary of the reasonable alternatives studied (including local alternatives studied prior to the Government's announcement of the preferred route in July 2017). Local alternatives studied post July 2017 are reported in the relevant Volume 2: Community area reports.

Volume 2: Community area reports and map books

These cover the following community areas:

- western leg: MA01 Hough to Walley's Green; MA02 Wimboldsley to Lostock Gralam; MA03 Pickmere to Agden and Hulseheath; MA04 Broomedge to Glazebrook; MA05 Risley to Bamfurlong; MA06 Hulseheath to Manchester Airport; MA07 Davenport Green to Ardwick; MA08 Manchester Piccadilly Station; and
- eastern leg: LA01 Lea Marston to Tamworth; LA02 Birchmoor to Austrey; LA03 Appleby Parva to Ashby-de-la-Zouch; LA04 Coleorton to Kegworth; LA05 Ratcliffe-on-Soar to Long Eaton; LA06 Stapleford to Nuthall; LA07 Hucknall to Selston; LA08 Pinxton to Newton and Huthwaite; LA09 Stonebroom to Clay Cross; LA10 Tibshelf to Shuttlewood; LA11 Staveley to Aston; LA12 Ulley to Bramley; LA13 Ravenfield to Clayton; LA14 South Kirkby to Charlston Common; LA15 Warmfield to Swillington and Woodlesford; LA16 Garforth and Church Fenton; LA17 Stourton to Hunslet; and LA18 Leeds Station.

The reports provide the following information for each area, as identified at a stage in the ongoing design and environmental assessment:

- an overview of the area;
- a description of the construction and operation of the Proposed Scheme within the area;
- a summary of the local alternatives considered since the Government's announcement of the preferred route in July 2017;
- a description of the environmental baseline;
- a description of the likely significant beneficial and adverse effects of the Proposed Scheme;
- the proposed means of avoiding, reducing or managing the likely significant adverse effects; and
- where possible, the proposals for monitoring, including measures during and post construction, and during the operational phase.

The maps relevant to each community area are provided in a separate Volume 2: Community area map book. These maps include the location of the key environmental features (Map Series CT-10), key construction features (Map Series CT-05) and operation features (Map Series CT-06) of the Proposed Scheme. There are also specific maps showing proposed viewpoint and photomontage locations (Map Series LV-00, LV-02, LV-03, and LV-04, to be read in conjunction with Section 11, Landscape and visual of the Volume 2: Community area reports), operational sound contour maps (Map Series SV-01, to be read in conjunction with Section 13, Sound, noise and vibration of the Volume 2: Community area reports) and maps showing key surface water and groundwater features (Map Series WR-01 and WR-02, to be read in conjunction with Section 15, Water resources and flood risk of the Volume 2: Community area reports).

In addition to the community areas detailed above, reports are provided for community areas within which electrification of a section of the MML is proposed: MMLo1 Danesmoor to Brierley Bridge and MMLo2 Unstone Green to Sheffield Station. These reports are provided at an earlier stage of the design and environmental assessment process, following the amendment of the route of the Proposed Scheme to include the electrification of a section of the MML between Clay Cross and Sheffield Midland Station. This would enable high speed trains to connect to Chesterfield and Sheffield as part of the Proposed Scheme. They include for each area:

- an overview of the area;
- a description of the proposed works within the area, based on a stage in the ongoing design;
- an outline of potential effects; and
- an overview of stakeholder engagement and consultation to be carried out as part of the EIA process.

Mitigation measures have not been identified at this stage of the design and environmental assessment process in relation to the likely effects arising from construction and operation of the Proposed Scheme for the MMLo1 Danesmoor to Brierley Bridge and MMLo2 Unstone Green to Sheffield Station areas. Any required mitigation measures will be reported in the formal ES. In addition, any required environmental monitoring during operation of the Proposed Scheme will be reported in the formal ES.

Volume 3: Route-wide effects

This describes the effects that are likely to occur at a geographical scale greater than the community areas described in the Volume 2: Community area reports, based on a stage in the ongoing design and environmental assessment.

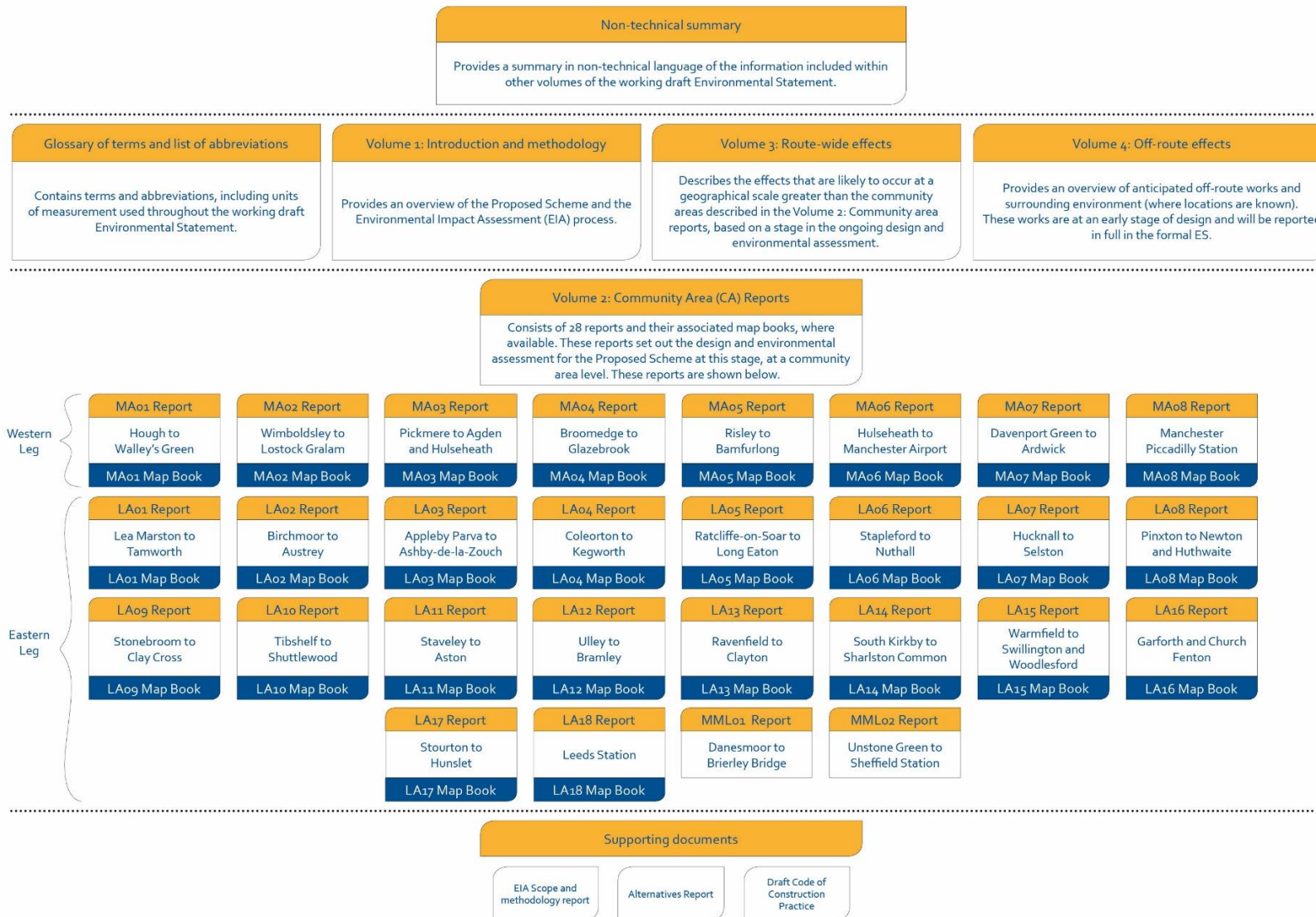
Volume 4: Off-route effects

This provides an overview of anticipated off-route works and surrounding environment (where locations are known) together with indicative lists of environmental topics expected to be included in the formal ES in due course. These works are at an early stage of design and will be reported in full in the formal ES.

Supporting documents

- EIA Scope and Methodology Report: this outlines the scope and methodology adopted for the EIA. HS2 Ltd consulted on a draft of the EIA Scope and Methodology Report (SMR) between July and September 2017. This updated version takes into consideration comments received, where appropriate, in addition to changes required as a result of updates to legislation or industry best practice guidance;
- Alternatives report: this describes the evolution of the Proposed Scheme and the reasonable alternatives considered at this stage of the design, at the strategic, route-wide, route corridor and local levels; and
- Draft Code of Construction Practice (CoCP): this sets out measures and standards to provide effective planning, management and control of potential impacts on individuals, communities and the environment during construction.

Figure 1: Structure of the working draft Environmental Statement



Structure of this report

Volume 4 of the formal ES that will accompany the deposit of the hybrid Bill will describe the likely significant environmental effects associated with off-route works. The need for these works arises from the design development of the Proposed Scheme as a whole. Therefore, for the working draft ES a large number of the off-route elements of the scheme are at a very early stage of development, or not known. This report utilises available information to provide an overview of the anticipated off-route works, their surrounding environment (where locations are known) and the approach to their assessment. It comprises the following sections:

- Section 1: provides an overview of HS2 and the working draft ES;
- Section 2: provides an overview of the anticipated approach to engagement and consultation with stakeholders;
- Section 3: provides an initial indication of off-route railway stations that may be affected by the Proposed Scheme;
- Section 4: provides an indication of potential depot needs within certain off-route areas and an overview of the works associated with them;
- Section 5: provides an overview of works required to the conventional railway network as a result of the Proposed Scheme; and
- Section 6: explains that there may be other types of off-route effects that require assessment as a consequence of the Proposed Scheme, including forecast changes in movements on the conventional railway network that result from the Proposed Scheme.

Information to be provided in Volume 4 of the formal ES

The methodologies used for the assessments described in sections 3 to 6 of this report will accord, unless stated otherwise, with the methodologies for each environmental topic described in the EIA Scope and Methodology (SMR)¹ and Volume 1: Introduction and methodology (Section 8). The formal ES will only present findings for those environmental topics which are scoped in. It is expected that the environmental baseline, an assessment of construction and operational effects, the proposed mitigation measures, the likely significant residual effects and any requirements for monitoring will be reported in Volume 4 of the formal ES.

¹ Supporting document: HS2 Phase 2b *Environmental Impact Assessment Scope and Methodology Report*

1 Introduction

1.1 Overview of High Speed Two

- 1.1.1 High Speed Two (HS2) is a new high speed railway proposed by the Government to connect major cities in Britain. New stations in London, Birmingham, Leeds, Manchester and East Midlands would be served by high speed trains running at speeds of up to 360 kilometres per hour (kph) (225 miles per hour (mph)). HS2 trains would also run on the existing network to serve destinations including Crewe, Preston, Liverpool, Sheffield, Newcastle, York, Glasgow and Edinburgh.
- 1.1.2 In January 2012, following a consultation exercise, the Government announced its intention to develop a Y-shaped high speed rail network, which would be brought forward in two phases. The 2012 decision confirmed the Government's preferred route for a high speed line between London and the West Midlands, called Phase One. In November 2013, HS2 Ltd deposited a hybrid Bill in Parliament to seek powers for the construction and operation of Phase One. The High Speed Rail (London – West Midlands) Act received Royal Assent in February 2017 and pre-construction work on Phase One commenced in July 2017.
- 1.1.3 In January 2013, the Government announced its initial preferred route for Phase Two between the West Midlands, Leeds and Manchester. Following some minor amendments, the proposed route was subject to a seven-month public consultation from July 2013 until January 2014.
- 1.1.4 In two reports, *HS2 Plus*² and *Rebalancing Britain*³, Sir David Higgins recommended accelerating the section of the Phase Two route between the West Midlands and Crewe to deliver some of the benefits that HS2 would bring to the region and the North sooner. In the November 2015 Command Paper *High Speed Two: East and West: The next steps to Crewe and beyond*⁴, the Government announced its intention to bring forward the route between the West Midlands and Crewe, and set out the preferred line of route for what is known as Phase 2a. Phase 2a involves the construction of the first approximately 58km of the western leg of Phase Two from the end of the Phase One route to Crewe, with a connection to the West Coast Main Line (WCML) at Crewe. In July 2017, HS2 Ltd deposited a hybrid Bill to Parliament to seek powers for the construction and operation of Phase 2a. A subsequent ES deposited with an Additional Provision to that Bill followed in March 2018. The High Speed Rail (West Midlands - Crewe) Act is expected to receive Royal Assent in 2019.
- 1.1.5 On 15 November 2016 the Government set out the majority of its preferred route⁵ between Crewe and Manchester and between the West Midlands and Leeds, referred

² HS2 Ltd (2014), *HS2 Plus – A report by David Higgins*. Available online at:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/374695/HS2_Plus_-_A_report_by_David_Higgins.pdf

³ HS2 Ltd (2014), *Rebalancing Britain – From HS2 towards a national transport strategy*. Available online at:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/374709/Rebalancing_Britain_-_From_HS2_towards_a_national_transport_strategy.pdf

⁴ Department for Transport (2015), *High Speed Two: East and West: The next steps to Crewe and beyond November 2015*. Cm 9157. Available online at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/480712/hs2-east-and-west.pdf

⁵ Department for Transport (2016), *High Speed Two: From Crewe to Manchester, the West Midlands to Leeds and beyond*. Cm 9355, November 2016. Available online at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/568208/high-speed-two-crewe-manchester-west-midlands-leeds-web-version.pdf

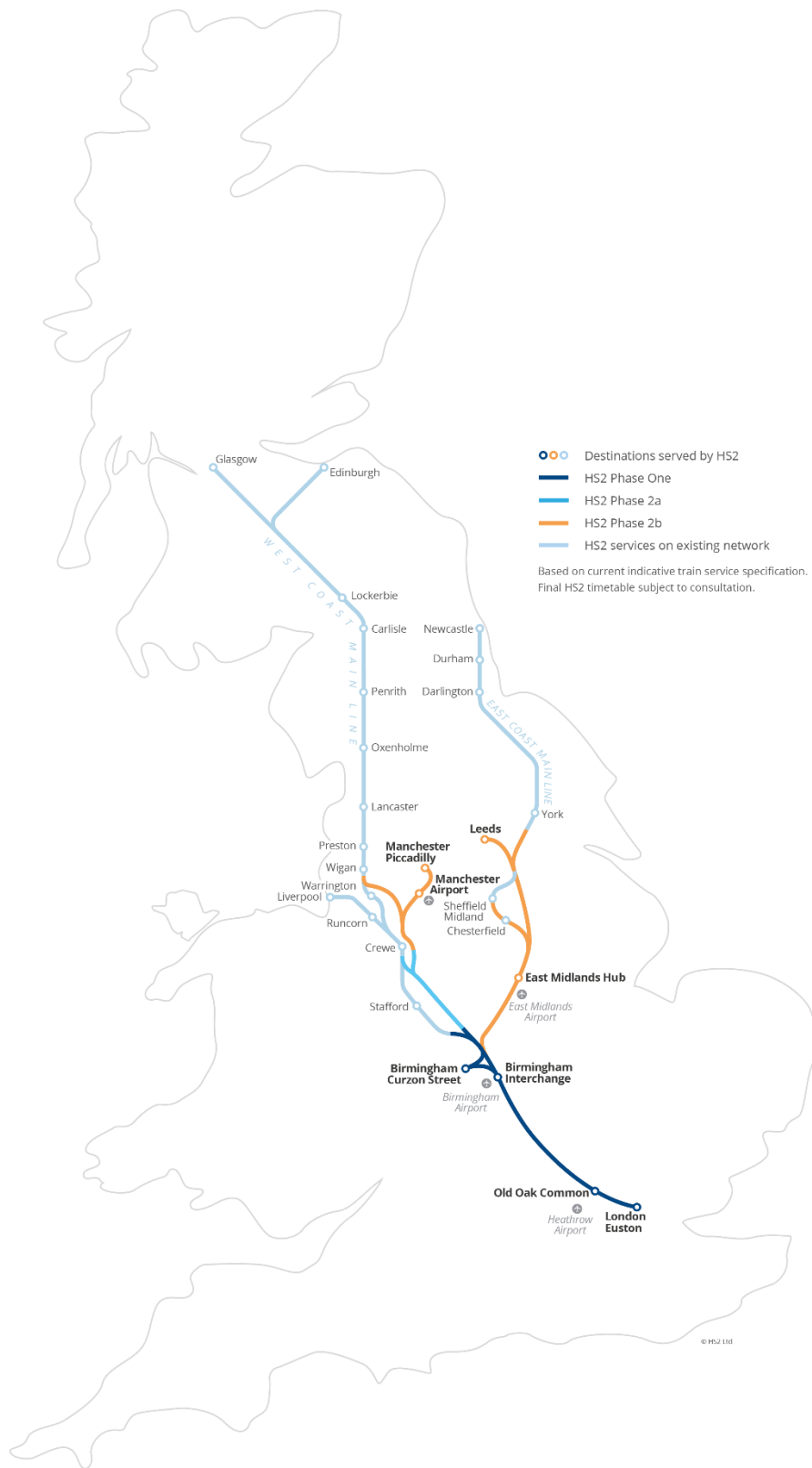
to as Phase 2b and completing what is known as the 'Y network'. Alongside the preferred route of Phase 2b, the Government also announced a consultation on seven route refinement areas.

- 1.1.6 On 17 July 2017, the Government announced a decision on these refinements and confirmed the remainder of the preferred route for Phase 2b.
- 1.1.7 Phase 2b, referred to as 'the Proposed Scheme', is the subject of this working draft Environmental Statement (ES). The working draft ES is an interim report presenting preliminary environmental information for consultation. The design and assessment of the Proposed Scheme are at an early stage of development and are presented here to enable the public and stakeholders to provide comments, which will be taken into account, as appropriate. The environmental impact assessment (EIA) and design of the Proposed Scheme will continue to be refined during and following this consultation and reported in the formal ES. Therefore, nothing included at this stage is intended to limit the form of the final scheme that will be presented in the hybrid Bill and formal ES.
- 1.1.8 The Proposed Scheme comprises the route from Crewe to Manchester with a connection onto the WCML (referred to as the 'western leg'), and from the West Midlands to Leeds via the East Midlands and South Yorkshire with a connection onto, and part electrification of, the Midland Main Line (MML) and a connection onto the East Coast Main Line (ECML) (referred to as 'the eastern leg'). Since the Government announced the preferred route for Phase 2b in July 2017, the Proposed Scheme was amended to include the electrification of a section of the MML between Clay Cross and Sheffield Midland Station⁶. This would enable high speed trains to connect to Chesterfield and Sheffield as part of the Proposed Scheme. The design of the proposed electrification of this section of the MML is at an early stage of development (as reported in the Volume 2: Community area reports MMLo1: Danesmoor to Brierley Bridge and MMLo2: Unstone Green to Sheffield Station) and the outcome of the environmental assessment of the likely significant effects of the electrification works will be reported in the formal ES.
- 1.1.9 The powers for Phase 2b will be sought through a hybrid Bill ('the Bill') that is expected to be deposited in Parliament in 2020. Construction of Phase 2b is anticipated to commence in approximately 2023, with operation planned to start around 2033.

⁶ HS2 Ltd (2018). Press release: HS2 Ltd to undertake development works for electrification of the Midland Main Line. Available online at: <https://www.gov.uk/government/news/hs2-ltd-to-undertake-development-works-for-electrification-of-the-midland-main-line>

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Figure 2: The HS2 network



2 Stakeholder engagement and consultation

2.1 Introduction

- 2.1.1 HS2 Ltd's approach to stakeholder engagement and consultation on the Proposed Scheme is set out in Volume 1: Introduction and methodology, Section 3.
- 2.1.2 Since the initial preferred route announcement in November 2016, HS2 Ltd has carried out a programme of informal stakeholder engagement and formal consultation with a broad range of stakeholders. This process remains ongoing and engagement will be undertaken with stakeholders in areas affected by off-route works, as details of off-route works become known during design development.
- 2.1.3 Feedback from this engagement and the consultation on the working draft ES and emerging scheme design, will continue to be considered as part of the ongoing design and assessment of the Proposed Scheme, ultimately reported in the formal ES. There will be further consultation undertaken on the formal ES by Parliament following deposit of the hybrid Bill.

2.2 Key stages of Phase 2b engagement and consultation

- 2.2.1 The process of engagement remains ongoing. A summary of engagement undertaken or underway since the initial preferred route announcement in November 2016, is provided in Table 1.

Table 1: Mechanisms and timeline of stakeholder engagement since route announcement

Engagement and consultation activity and mechanisms	Date
Phase 2b initial preferred route announcement	15 November 2016
Phase 2b route refinement and property consultation	15 November 2016 – 9 March 2017
Phase 2b information events to support the route refinement and property consultations	January – February 2017
Confirmation of Phase 2b route announcement	17 July 2017
Start date of engagement with local communities and stakeholders regarding the Phase 2b Proposed Scheme	July 2017
Consultation on the draft EIA SMR and Equality Impact Assessment (EQIA) SMR to inform the EIA and EQIA and the proposed relocation of the Eastern Leg Rolling Stock Depot	17 July 2017 – 29 September 2017
Phase 2b route information events to support SMR and Eastern Leg Rolling Stock Depot consultations	June-July 2018

Engagement and consultation activity and mechanisms	Date
Phase 2b consultation on the working draft ES and working draft EQIA	October – December 2018
Engagement on the proposed electrification of a section of the MML	Autumn 2018/Spring 2019

EIA SMR consultation

- 2.2.2 The draft EIA SMR was formally consulted on between July and September 2017 and was issued to statutory bodies, non-government organisations and local authorities⁷. It was also available on the Government’s website, allowing comment by local interest groups and the public. One hundred and seven responses to the draft EIA SMR were received, as a result of which changes were made to the EIA SMR. These are set out in the EIA SMR Consultation Summary Report published alongside this working draft ES, and will be used to inform the impact assessment methodologies applied for the formal ES.

Consultation on the working draft ES and ongoing engagement

- 2.2.3 As set out in Volume 1, the working draft ES is being formally consulted upon during October and December 2018. A parallel consultation on the working draft EQIA is also being undertaken during this period. As part of the process of consultation, stakeholders are invited to comment on the Proposed Scheme and the working draft ES and the working draft EQIA Reports which inform it.
- 2.2.4 These consultations and wider feedback from ongoing stakeholder engagement will continue to be considered as part of the ongoing design of the Proposed Scheme and the environmental impact assessment, including mitigation opportunities, for off-route works. A consultation summary report will be published with the formal ES explaining how the responses have been taken into consideration.

2.3 Informing the design and impact assessment of the Proposed Scheme

- 2.3.1 The main purpose of stakeholder engagement and consultation at this early stage is to inform the design and environmental impact assessment of the Proposed Scheme. Volume 1 details the engagement and consultation undertaken prior to the initial preferred route announcement in November 2016.
- 2.3.2 Engagement will be undertaken on works within off-route areas and feedback will continue to be considered as part of the ongoing design of the Proposed Scheme.

⁷ The locations of off-route works were not known at the time of consultation. It was not therefore possible to consult statutory bodies, non-government organisations or local authorities in these areas.

2.4 Engagement and consultation with stakeholder groups

- 2.4.1 Engagement will be undertaken with relevant stakeholders in off-route areas to give affected communities the opportunity to raise issues and opportunities in relation to the Proposed Scheme. Stakeholders will be provided with information on the development of the Proposed Scheme, as a basis from which to identify potential impacts and opportunities for mitigation within the local area, reflecting local conditions and issues. Further information on the approach to engagement is provided in the SMR.

3 Off-route railway stations

3.1 Introduction

3.1.1 Once HS2 is completed there would be an increase in frequency of services to destinations including Liverpool, Preston, Scotland and Newcastle. Further information is provided in the HS2 Phase Two Strategic Case⁸.

3.1.2 This section of the report provides an overview of the off-route railway stations where changes may occur as a consequence of operation of the Proposed Scheme. Off-route railway stations potentially affected by the Proposed Scheme fall into two categories:

- Existing railway stations on the conventional railway network, to the north of the Proposed Scheme on the WCML corridor and the ECML corridor, where physical works would be required. These works may be required to accommodate longer 400 metre (m) HS2 trains introduced by the Proposed Scheme, or be due to existing capacity constraints necessitating additional infrastructure to accommodate HS2 trains. These are expected to include stations at:
 - the Western leg (north of Manchester): Preston, Carlisle and Carstairs; and
 - the Eastern leg (north of Leeds): York.
 - Other stations may also fall within this category and, if so, will be identified in the formal ES. Works required to Sheffield Midland Station are not considered to be off-route and are reported in Volume 2: Community area report MMLo2: Unstone Green to Sheffield Station of the working draft ES.
- Railway stations across the conventional railway network, including HS2 Phase One and Phase 2a stations, where operation of the Proposed Scheme, and the consequent release of capacity elsewhere, would result in an increase in passenger numbers. These stations will be identified by the PLANET framework model⁹ (PLANET model) which identifies any increases in the numbers of passengers accessing/leaving a station. Any increase in passengers would lead to increases in access journeys by car, taxi, pedestrian, cyclist, bus and tram, for example. These increases would not necessarily require any physical works to the station or surrounding area. If any physical works are required as a result of increased passenger numbers, the impacts of these works will be assessed and any likely significant effects will be reported in the formal ES. Estimates of the changes in passenger use are not currently available as PLANET modelling is ongoing. The output from the PLANET model will inform the assessment and will be reported in the formal ES.

⁸ Department for Transport (2017), *High Speed Two, Phase Two Strategic Case, Moving Britain Ahead*. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/629393/high-speed-two-phase-two-strategic-case.pdf

⁹ The PLANET framework model is a strategic transport model covering all long-distance rail movements across the United Kingdom (UK). It is the Department for Transport's (DfT) forecasting model and has been used to develop rail demand forecasts as a result of the Proposed Scheme.

Works to existing railway stations north of Manchester and Leeds

- 3.1.1 There is a requirement to undertake works such as platform extensions with associated track/rail systems alterations at a number of railway stations on the existing conventional railway network (WCML and ECML corridors) to the north of Manchester and Leeds. These works would be needed to allow 400m long HS2 trains to call at these stations or to increase the number of platforms for additional trains to call.
- 3.1.2 Works associated with accommodating more or longer HS2 trains typically include the addition or extension of one or more platforms at a station, associated track/rail system alterations and the modification of traction power equipment, overhead line equipment, and signalling and communications equipment. In some instances additional platforms would be provided for conventional railway services.
- 3.1.3 Paragraphs 3.1.6 – 3.1.30 of this report provide an overview of works and the surrounding environment at each of the stations where physical works are expected.

Preston Station

- 3.1.4 It is anticipated that once the Proposed Scheme is operational 400m long HS2 trains would call at Preston Station. In order to accommodate these trains, extension of one or more of the existing platforms at the station would be required, with potential associated station enhancements. Additional platforms for conventional services may also be required within the station area. Associated rail systems¹⁰ alterations on the approaches to the station would also be necessary. It is expected that all of these works would be undertaken within the existing railway boundary.
- 3.1.5 Preston Station is situated to the south-west of Preston city centre, within an urban environment. The station car park, Fishergate retail centre and car park are sited immediately to the east of the station. Network Rail and Royal Mail depots are sited immediately to the west of the station, with housing beyond.
- 3.1.6 Preston Sports club, Lancashire County Council's East Cliff offices, Avenham and Miller parks, and the River Ribble are to the south of the station. This area includes small areas of woodland and vegetation. Preston Station and Fishergate Bridge immediately to the north are grade II listed buildings. Avenham Conservation Area is situated to the south-east of the station and includes Miller Park and residential streets to the north-east of the park.
- 3.1.7 Any potential environmental impacts in this area arising as a result of the Proposed Scheme will be assessed and any likely significant effects reported in the formal ES.

Carlisle Station

- 3.1.8 Carlisle is the most southerly point on the existing WCML infrastructure where dividing, and re-joining, HS2 trains is practicable whilst maintaining operational efficiency elsewhere on the network. Development work is ongoing to determine whether the dividing and re-joining of HS2 trains could occur at Carlisle, as an

¹⁰ Rail systems includes track, signalling, overhead catenary systems (OCS), communication equipment, power supply.

alternative to Carstairs (see paragraphs 3.1.14 – 3.1.21). If confirmed, the proposals will be assessed and any likely significant effects will be reported in the formal ES.

- 3.1.9 It is anticipated that, once the Proposed Scheme is operational, 200m long HS2 trains would stop at Carlisle Station. Given its location, there is the potential for HS2 400m long trains to stop at Carlisle Station to be divided into 200m long trains for onward journeys to Glasgow and Edinburgh.
- 3.1.10 In order to accommodate these trains, extension of one or more of the existing platforms at the station would be required, with potential associated station enhancements. Additional platforms for conventional railway services may also be required within the station area. Associated rail systems alterations on the approaches to the station would also be necessary. It is expected that all of these works would be undertaken within the existing railway boundary.
- 3.1.11 Carlisle Station is located within the centre of Carlisle, within an urban environment. The station is enclosed to a large degree by high station walls and by the roads around the station, which include Borough Street, Collier Lane, Crown Street, St George Street and Victoria Viaduct. Nearby land uses include industrial and business uses, retail and leisure uses. There is very limited residential property within the vicinity of the station.
- 3.1.12 The station is a grade II* listed building and there are a number of other listed buildings in the vicinity, particularly to the north of the station building. There is a scheduled monument to the north-west of the station (Roman and medieval town area bounded by Heads Lane West Wall and Blackfriars Street).
- 3.1.13 Any potential environmental impacts in this area arising as a result of the Proposed Scheme will be assessed and any likely significant effects reported in the formal ES.

Carstairs Station

- 3.1.14 Carstairs is the most northerly point on the WCML before that line divides en route to Glasgow and Edinburgh.
- 3.1.15 It is currently anticipated that once the Proposed Scheme is operational 400m long HS2 trains would be divided into 200m long trains and re-joined at this location on their journeys to and from Glasgow and Edinburgh without necessarily stopping at the station. In order to accommodate these operations, additional rail systems infrastructure may be required. Development work is ongoing to determine whether the dividing and re-joining of HS2 trains could occur at Carlisle, as an alternative to Carstairs (see paragraphs 3.1.8 – 3.1.13).
- 3.1.16 Although it is not currently envisaged that passengers would be taken on or discharged at Carstairs Station, there is the potential for this to happen. In that case it would be necessary to undertake works to extend one or more platforms to accommodate 400m long HS2 trains.
- 3.1.17 In the event that the dividing and re-joining of HS2 trains is undertaken at Carlisle Station, there would be no need for works to accommodate this at Carstairs, although some junction improvement works may still be necessary to facilitate HS2 trains.

- 3.1.18 Carstairs is situated in South Lanarkshire to the south-east of Glasgow and south-west of Edinburgh. It is on the northern edge of the small settlement of Carstairs Junction. A railway maintenance yard is sited to the north of the station.
- 3.1.19 Residential properties abut the station to the south in Strawfrank Road, Moss Road and St Charles Avenue and to the north in the vicinity of Eskdale Farm. Carstairs Junction primary school is approximately 400m to the south of the station. A secure hospital, known as The State Hospital, is sited approximately 850m north-east of the station, and immediately abutting the railway line leaving the station.
- 3.1.20 Carstairs Station and the associated village are within a rural, undeveloped area, and land uses surrounding the station and village are predominantly agricultural. Small areas of mature woodland are sited immediately to the north and east of the station, and a larger area of mature woodland and vegetation adjoins the village to the south-west of the station. There are three geological Sites of Special Scientific Interest (SSSIs) within the local area; the closest of which is located 1.6km to the south of the station.
- 3.1.21 Any potential environmental impacts in this area arising as a result of the Proposed Scheme will be assessed and any likely significant effects reported in the formal ES.

York Station

- 3.1.22 It is anticipated that once the Proposed Scheme is operational 200m long HS2 trains would call at York Station.
- 3.1.23 In order to accommodate these trains and to provide additional accommodation for conventional railway services, up to three additional platforms may be required, together with associated station enhancements. Associated rail systems alterations on the approaches to the station would also be necessary, including the potential reinstatement of a former section of track between York Station and Skelton Junction¹¹.
- 3.1.24 It is expected that all of these works would be undertaken within the existing railway boundary.
- 3.1.25 York Station is on the western edge of York city centre, within an urban environment. Land to the west of the station is dominated by railway infrastructure, car parking and the National Railway Museum.
- 3.1.26 The River Ouse and a number of public open spaces lie to the north of the station. Land uses to the south and east include car parking, leisure uses, public open space and the city walls.
- 3.1.27 The railway station is a grade II* listed building, and the city walls and associated features to the east of the station together comprise a scheduled monument. Another scheduled monument, St Mary's Abbey, is located to the north-east of the station, on the northern side of the River Ouse. A large number of listed buildings are within the vicinity, particularly to the east of the station.

¹¹ Some limited stabling facilities for HS2 conventional compatible trains may be required in this area and are discussed further in section 5.

- 3.1.28 Any potential environmental impacts in this area arising as a result of the Proposed Scheme will be assessed and any likely significant effects reported in the formal ES.

3.2 Railway stations across the conventional railway network

- 3.2.1 Off-route railway stations on the conventional railway network, and Phase One and Phase 2a stations, may experience environmental effects where the operation of the Proposed Scheme, including the use of released capacity on the conventional railway network, results in increased passenger numbers. This section of the report explains how such stations are identified for the purposes of the environmental impact assessment that will be reported in the formal ES.
- 3.2.2 The off-route assessment for the Proposed Scheme will follow the same approach as used for HS2 Phase One and Phase 2a to identify off-route stations where an increase in passenger numbers would occur and to assess the potential for this to result in likely significant effects as a result of the Proposed Scheme, and of HS2 Phase One, Phase 2a and Phase 2b combined.
- 3.2.3 The identification of stations for assessment of off-route effects is based upon the Phase 2b EIA SMR criteria for Traffic and transport impacts and takes into account the potential for Air quality; Community; Sound, noise and vibration; and any other relevant environmental effects. The Phase 2b EIA SMR criteria identify a 10% change in use (measured in this context in terms of railway station passenger footfall) as a threshold for when impacts on transport infrastructure, such as bus facilities, parking provision or taxi usage, might become significant and when changes in traffic might affect pedestrian and cyclist severance¹².
- 3.2.4 A further criterion will be applied to identify the potential effects on traffic congestion and delays, taking into account the capacity of station access routes. A minimum change in likely highway use of 5% per day has been adopted and this will be used to calculate an equivalent daily change in rail passengers. If a station is served by a busy urban single carriageway road, a threshold of a change of 700 users per day will be applied. For stations with higher capacity and dual carriageway road access, a higher threshold of 1,400 users per day will be used. These thresholds assume a reasonable maximum percentage of passengers likely to arrive or depart by car or taxi and likely passenger arrival and departure times.
- 3.2.5 If the thresholds for impacts on transport infrastructure and severance (a 10% change in use) or congestion (5% of highway capacity, i.e. a change of 700 or 1,400 users per day depending on the type of road) are likely to be exceeded, further analysis will be used to determine whether the changes in use would be likely to result in likely significant effects. Below these thresholds, the potential impact on transport facilities, congestion, air quality, sound, noise and vibration and community are likely to be negligible.

¹² HS2 Ltd (2017), *West Midlands - Crewe Environmental Statement Volume 4: Off-route effects*

Forecast change in passengers (PLANET model)

3.2.6 Changes to the PLANET Model made since the HS2 Phase 2a analysis in 2017 include:

- revisions to forecast conventional railway services and the HS2 proposed service patterns;
- updated forecasts of the growth in travel, building on the latest evidence of current patterns of rail travel (including updating the base model);
- changes to official forecasts for the growth of the UK economy and other drivers of transport demand; and
- updates to assumptions relating to committed transport investment.

3.2.7 Data from the PLANET Model will be used to obtain forecast changes in passenger demand at both HS2 and off-route stations as a result of the Proposed Scheme, including updated forecasts for Phase One and Phase 2a and for HS2 Phase One, Phase 2a and Phase 2b combined.

Selection of off-route railway stations to be assessed

3.2.8 The criteria and forecast described above will be used to identify stations where changes in passenger use arising from the Proposed Scheme in isolation, and in combination with HS2 Phase One and Phase 2a, could give rise to effects on other transport networks. The screening will be based on the PLANET Model forecast of changes in passenger numbers at all stations across the network with HS2 Phase One, Phase 2a and Phase 2b operational.

3.2.9 The changes in use identified for the Proposed Scheme, HS2 Phase One and HS2 Phase 2a combined will be compared to those assessed in the HS2 Phase 2a (and Phase One) ES.

4 Off-route depots

4.1 Introduction

4.1.1 HS2 trains serving the north of England and Scotland will need overnight stabling and some depot facilities in the event that it is operationally impracticable for them to be returned to the proposed HS2 rolling stock depots at Crewe and Leeds. The assessment of likely significant effects resulting from the provision of off-route depots will be reported in Volume 4 of the formal ES. For the working draft ES only limited information is available, as design and optioneering work is at an early stage. This section provides an overview of the possible depot locations and their surrounding environment.

4.2 Overview of proposed off-route depots

Introduction

4.2.1 Based on the current stage in the ongoing design and environmental assessment process it is expected that approximately three off-route stabling and depot facilities would be provided in the following locations:

- Western Leg - between Carlisle, Glasgow and Edinburgh near WCML; and
- Eastern Leg - in the York Tyne and Wear areas.

4.2.2 The off-route depots would be used for the overnight stabling, cleaning and maintenance of HS2 trains.

4.2.3 Maintenance includes activities such as the inspection of units, cleaning, re-stocking of consumables, and watering and emptying of controlled emission toilets. These activities would take place outside of the usual operating hours of the HS2 train service and would include work during the night and at weekends. The stabling, cleaning and maintenance activities that are undertaken at train depots require trains to be moved around the depots during these periods to allow the efficient use of fixed equipment and facilities.

4.2.4 Paragraphs 4.2.5 – 4.2.12 of this report provide an overview of works and the surrounding environment, where possible, in the areas where depots are expected to be located.

Between Carlisle, Glasgow and Edinburgh near WCML

4.2.5 The Phase One ES identified Polmadie depot as a location for overnight stabling of 4 x 200m long HS2 trains.

4.2.6 For Phase One and Phase 2b combined, additional train stabling would be required for approximately 25 x 200m long HS2 trains. This could be within one depot with capacity for 25 trains, or two or more smaller depots, one of which may be Polmadie.

4.2.7 Development work is ongoing to determine the location or locations for these facilities. Once confirmed, the proposals will be assessed and any likely significant

effects will be reported in the formal ES. HS2 will engage with relevant stakeholders as part of this process.

York area

- 4.2.8 Some limited stabling facilities for approximately 4 x 200m long HS2 trains may be required in this area. Development work is ongoing to determine the location or locations for these facilities. It is currently anticipated that such facility or facilities within the York area would be provided within existing Network Rail land.
- 4.2.9 This area is urban/semi-urban and the railway runs in proximity to the River Ouse between York Station and Skelton Bridge. The area around York Station is of particular interest in historic environment terms, and includes listed buildings, and two scheduled monuments.
- 4.2.10 Once confirmed, the proposals will be assessed and any likely significant effects will be reported in the formal ES. HS2 Ltd will engage with relevant stakeholders as part of this process.

Tyne and Wear area

- 4.2.11 For Phase 2b, train stabling would be required for approximately 11 x 200m long HS2 trains. Development work is ongoing to determine the location or locations for these facilities.
- 4.2.12 Once confirmed, the proposals will be assessed and any likely significant effects will be reported in the formal ES. HS2 Ltd will engage with relevant stakeholders as part of this process.

5 Modifications to the conventional railway network

5.1 Introduction

- 5.1.1 Rail systems modification works would be required at a number of locations on the conventional railway network, including the WCML and ECML, as a result of the Proposed Scheme. The proposed works would help to ensure that best use is made of existing rail capacity, while maintaining operational flexibility.
- 5.1.2 Such works are likely to include:
- the installation of new track switches and crossings;
 - provision of freight loops and supporting signalling;
 - electrification; and
 - other rail systems infrastructure as required.
- 5.1.3 Generally these works fall within the existing conventional railway boundary.
- 5.1.4 It is likely that, in addition to the works outlined in this section, there will be consequential works to Network Rail infrastructure as a result of the Proposed Scheme. Such works are not expected to require development consent through the HS2 Phase 2b hybrid Bill, or to be of a scale that would be likely to have potential for significant environmental effects.
- 5.1.5 There may also be further works required to the conventional railway network in future to accommodate growing demand for passenger and freight services together with HS2 services. In so far as those works involve further powers, or potentially give rise to significant effects, further applications for consents or approvals will be undertaken as required at the relevant time.
- 5.1.6 Works that may fall within the scope of the off-route assessment to be reported in the formal ES, on the basis that they have potential to give rise to significant environmental effects, are expected to occur at points within the route sections described below. The majority of works to the MML are included in Volume 2: Community area reports MMLo1: Danesmoor to Brierley Bridge and MMLo2: Unstone Green to Sheffield Station of the working draft ES, with the exception of the section of the Sheffield loop that is north of Sheffield and extends to Clayton junction which is off-route and reported in Volume 4 for the working draft ES and will be reported in Volume 4 for the formal ES.
- 5.1.7 WCML capacity improvements works would be required at locations still to be identified within the following route sections:
- Western leg:
 - Lily Lane to South Preston;
 - Carlisle to Carstairs;

- Carstairs to Glasgow; and
- Carstairs to Edinburgh.
- Eastern leg:
 - Sheffield loop – north of Sheffield to Clayton junction;
 - Ulleskelf to Colton – electrification works;
 - York Station to Skelton Bridge junction; and
 - Northallerton to Newcastle.

5.1.8 Any likely significant effects resulting from modifications to the conventional railway network will be reported in Volume 4 of the formal ES. For the working draft ES only limited information is available, as design and optioneering work is at an early stage. This section provides an overview of the possible locations of modifications to the conventional railway network, their surrounding environment and potential environmental issues. It should be noted that works would not affect the entirety of the railway in these areas.

5.1.9 Paragraphs 5.2.1 – 5.2.13 of this report provide an overview of works to the conventional railway network within the route sections identified.

5.2 Overview of modifications to the conventional railway network

Western leg

5.2.1 The HS2 western leg joins the conventional railway (WCML) near Lily Lane, Bamfurlong. Between this connection and the south of Preston capacity enhancement works, including junction improvements, may be required. Any such works are expected to be within the existing railway boundary and at grade.

5.2.2 There is a requirement in the route sections between Carlisle and Carstairs, Carstairs and Glasgow, and Carstairs and Edinburgh for a number of junction improvements/capacity enhancement works. These are anticipated to be within the existing railway boundary and at grade.

5.2.3 Development work is ongoing to determine the location or locations for these facilities. Once confirmed, the proposals will be assessed and any likely significant effects will be reported in the formal ES.

Eastern leg

Sheffield Loop – North of Sheffield to Clayton Junction

5.2.4 Works to the existing conventional railway between Danesmoor and Sheffield Midland Station to facilitate HS2 London to Sheffield services are reported in the MMLo1 and MMLo2 reports within Volume 2 of the working draft ES.

5.2.5 However, in order to provide for the HS2 services between Birmingham and Leeds to stop at Sheffield Midland Station, there would be a need for further electrification and

capacity enhancements (including new junctions and additional tracks) between Sheffield Midland Station and Clayton junction.

- 5.2.6 For the purposes of this working draft ES, it is assumed that these works will be completed in time for commencement of operation of HS2 services to Leeds. The mechanism for delivery of the works between Sheffield Midland and Clayton Junction is still to be decided. If confirmed that this is to be included within the scope of the Phase 2b Bill, the proposals will be assessed and any likely significant effects will be reported in the formal ES accompanying the deposit of the Phase 2b Bill in Parliament.

Ulleskelf to Colton Junction – electrification works

- 5.2.7 For the purposes of this working draft ES, it is assumed that the unelectrified conventional railway line that connects the HS2 tracks south of Ulleskelf, to Colton Junction would be electrified where the ECML connects with this line, in time for commencement of operation of HS2 services to York.
- 5.2.8 The mechanism for delivery of electrification works between Ulleskelf and Colton Junction is still to be decided. If confirmed that this is to be included within the scope of the Phase 2b Bill, the proposals will be assessed and any likely significant effects will be reported in the formal ES accompanying the deposit of the Phase 2b Bill in Parliament.

York Station to Skelton Bridge Junction

- 5.2.9 The HS2 eastern leg joins the conventional railway (York to Church Fenton Line) near Ulleskelf. This connection and works to the conventional railway south of Colton junction are reported in Volume 2: Community area report: LA16 Garforth and Church Fenton of the working draft ES.
- 5.2.10 Associated rail systems alterations on the approaches to the station would also be necessary, including the potential reinstatement of a former section of track between York Station and Skelton Bridge Junction.
- 5.2.11 Development work is ongoing to determine the location or locations for these works. Once confirmed, the proposals will be assessed and any likely significant effects will be reported in the formal ES.

Northallerton to Newcastle

- 5.2.12 Capacity enhancement works, including junction improvements, may be required. Any such works are expected to be within the existing railway boundary and at grade.
- 5.2.13 Development work is ongoing to determine the location or locations for these works. Once confirmed, the proposals will be assessed and any likely significant effects will be reported in the formal ES.

6 Other off-route works

6.1 Introduction

- 6.1.1 The requirement for off-route works often emerges at a later stage of the scheme development process and it is therefore possible that other types of off-route works may be identified. If so, they will be assessed and any likely significant effects reported in Volume 4 of the formal ES.

6.2 Assessment of forecast changes in movements on the conventional railway network

- 6.2.1 HS2 would contribute to an increase in capacity on the UK's long distance railway network. By providing direct services on dedicated high speed lines, HS2 would release capacity on the congested WCML, south of Golborne, and ECML, south of York. North of these locations HS2 trains would operate on the conventional railway network providing services to destinations including Preston, Glasgow, Edinburgh and Newcastle.
- 6.2.2 The operation of Phase 2b would therefore result in changes to train flows on the conventional railway network at off-route locations. It will be necessary to consider these changes, together with the increased speed of services on parts of the WCML and ECML and, where appropriate, to assess the off-route effects from the operation of the Proposed Scheme in line with the EIA SMR.
- 6.2.3 Any likely significant effects arising as a result of off-route changes in train movements will be reported in Volume 4 of the formal ES.

6.3 Off-route highway modifications

- 6.3.1 It is expected that there could be a requirement for a number of highway and junction modifications. The purpose of such modifications would be to ensure relevant highways can accommodate construction and operational traffic generated by the Proposed Scheme. Some modifications to the conventional railway would be undertaken using engineering trains for haulage but there may be some modifications to roads due to the works carried out on the railway.
- 6.3.2 The majority of minor highway modifications will be reported in the Volume 2 of the formal ES. Volume 4 of the formal ES will include those highways and junction modifications that are remote from the route of the Proposed Scheme, including those associated with off-route works described in sections 3 to 5 of this report.
- 6.3.3 The majority of locations where highway modifications are likely to be required will be identified at a later stage of the scheme development process. Highway modifications may be either temporary to facilitate construction of the Proposed Scheme or permanent to facilitate the maintenance of the Proposed Scheme.

6.3.4 The proposed modification works could potentially include the following types of works:

- modifications to access roads (or new access routes) to off-route works such as depots;
- kerb realignments at junctions to allow safe turning;
- widening of existing highways that are currently too narrow for construction vehicles to use safely; and
- the provision of passing bays to allow safe passing of heavy goods vehicles (HGV) traffic, including abnormal loads, and HS2 maintenance vehicles.

6.3.5 If any off-route highway modifications are identified, Volume 4 of the formal ES will describe the nature of the works required at each highway modification location, provide an overview of the local environment and report any likely significant effects.

6.4 Power supply

6.4.1 A need to consider power supply for the western leg of Phase 2b to Manchester has been identified, and in particular the feasibility of connecting HS2 Phase 2b traction supplies near Crewe to the National Grid electrical distribution network. The estimated power supply connection date is 2027 when HS2 Phase 2a infrastructure is due to complete. A further increase in power consumption would occur when operation of Phase 2b is due to commence in 2033.

6.4.2 A feasibility study has been commissioned by HS2 Ltd to consider how the required power supply can be secured. Development work is ongoing and will identify connection options for further consideration.

6.4.3 Depending on the outcome of further studies, new power supply connections may be required in off-route locations to provide enough power to run the forecast train service. Once confirmed, the proposals will be assessed and any likely significant off-route effects will be reported in Volume 4 of the formal ES.

6.4.4 It is also possible that new power supply connections would be located within community areas to be reported in Volume 2, in which case further information would be provided and any likely significant effects would be reported in Volume 2 of the formal ES.

6.5 Potential effects scoped out of the off-route assessment

6.5.1 All off-route works will be considered in terms of their potential to give rise to significant environmental effects. Those that are considered, but then scoped out of the EIA, will be summarised in the formal ES.

7 References

Department for Transport (DfT), (2015), *High Speed Two: East and West: The next steps to Crewe and beyond November 2015*. Cm 9157. Available online

at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/480712/hs2-east-and-west.pdf

Department for Transport (2016), *High Speed Two: From Crewe to Manchester, the West Midlands to Leeds and beyond*. Cm 9355, November 2016. Available online

at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/568208/high-speed-two-crewe-manchester-west-midlands-leeds-web-version.pdf

Department for Transport (2017), *High Speed Two, Phase Two Strategic Case, Moving Britain Ahead*. Available online

at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/629393/high-speed-two-phase-two-strategic-case.pdf

Department for Transport (2017), *High Speed Two Phase Two strategic case appendix: HS2 released capacity study summary report*. Available online

at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/629168/high-speed-two-phase-two-strategic-case-appendix-hs2-released-capacity-study-summary-report.pdf

HS2 Ltd (2014), *HS2 Plus – A report by David Higgins*. Available online at:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/374695/HS2_Plus_-_A_report_by_David_Higgins.pdf

HS2 Ltd (2014), *Rebalancing Britain – From HS2 towards a national transport strategy*. Available online at:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/374709/Rebalancing_Britain_-_From_HS2_towards_a_national_transport_strategy.pdf

HS2 Ltd (2017), *West Midlands - Crewe Environmental Statement Volume 4: Off-route effects*.

Available online at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/627574/E11_Volume_4_Off-route_effects_WEB.pdf

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