



Department
for Transport

Government overview of the case for HS2 Phase 2a and its environmental impacts - Update for the House of Lords

Moving Britain Ahead



Government overview of the case for HS2 Phase 2a and its environmental impacts - Update for the House of Lords

Presented to Parliament
by the Secretary of State for Transport
by Command of Her Majesty

November 2020



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ISBN 978-1-5286-2261-5

CCS1120559130 11/20

Printed on paper containing 75% recycled fibre content minimum

Printed in the UK by the APS Group on behalf of the Controller of Her Majesty's Stationery Office.

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1. Introduction

- 1.1 High Speed Two (HS2) is the Government's proposal for a new, high speed railway connecting major cities in Britain. In January 2012, following a consultation exercise, the Government announced its intention to develop a Y-shaped high speed rail network. The network will be brought forward in 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 initial works for Phase One have commenced.
- 1.2 In two reports, HS2 Plus¹ and Rebalancing Britain², 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 will bring to the region sooner. In its November 2015 command paper³, the Government, announced its intention to bring forward the route between the West Midlands and Crewe with connections to the conventional rail network. It set out the preferred line of route for what is known as HS2 Phase 2a.
- 1.3 In July 2017, the Government deposited a hybrid Bill with Parliament to secure the powers to construct and operate HS2 Phase 2a between the West Midlands and Crewe. The Bill, which is entitled the 'High Speed Rail (West Midlands - Crewe) Bill' ("HS2 Phase 2a Bill"), is being promoted through Parliament by the Secretary of State for Transport (the 'Promoter'). The Promoter will appoint a body responsible for delivering HS2 Phase 2a under the powers granted by the HS2 Phase 2a Bill. This body is known as the 'nominated undertaker'. The nominated undertaker will be bound by the obligations contained in the HS2 Phase 2a Bill and the policies established in the Environmental Minimum Requirements (EMRs), see Information Paper E1: Control of Environmental Impacts. There may be more than one nominated undertaker.
- 1.4 In August 2019, Douglas Oakervee was announced as the Chair of an independent review of HS2. The review was asked to assemble and test all the existing evidence in order to make properly informed decisions on the future of Phases 1 and 2 of the project, including the estimated cost and schedule position. The review was published on 11 February 2020⁴ and concluded that the Government should continue to support the HS2 Phase 2a Bill through Parliament and that the original rationale for HS2 still holds.

¹ [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/374695/HS2_Plus - A report by David Higgins.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/374695/HS2_Plus_-_A_report_by_David_Higgins.pdf)

² [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/374709/Rebalancing Britain - From HS2 towards a national transport strategy.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/374709/Rebalancing_Britain_-_From_HS2_towards_a_national_transport_strategy.pdf)

³ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/480712/hs2-east-and-west.pdf

⁴ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/870092/oakervee-review.pdf

- 1.5 The HS2 Phase 2a Bill would provide the powers for a new high speed, high capacity line from the West Midlands to Crewe. HS2 Phase 2a will connect with Phase One at Fradley, to the north-east of Lichfield, and connect to the West Coast Main Line, south of Crewe, enabling high speed trains to call at Crewe Station and to provide onward services beyond the HS2 network. It will deliver faster services between London, Crewe, Manchester, Liverpool, Preston, Warrington, Wigan and Glasgow. It will allow passengers travelling to or from a wide range of places to connect onto HS2 services. Crewe is already a major hub on the rail network with regional and long-distance connections to the wider North West, East Midlands, and North and South Wales. It will mean that the North West and Scotland will see more of the benefits of HS2 more quickly, thus bringing economic benefits sooner, helping to rebalance the economy.
- 1.6 At Third Reading of the HS2 Phase 2a Bill, the House of Lords will be asked to approve the HS2 Phase 2a Bill. To assist the House of Lords in giving the HS2 Phase 2a Bill its Third Reading, Standing Order 83A(9) requires the Government to provide a statement. This statement sets out the main reasons and considerations upon which Parliament is invited to give consent to the project to be authorised by the HS2 Phase 2a Bill. The statement also sets out the main measures to avoid, reduce, and if possible, offset the major adverse effects of the project. This document provides that information. It summarises the work that has already been done to assess, control and mitigate the environmental impacts of HS2 Phase 2a. It also explains why the Government continues to take the view that the HS2 Phase 2a project is worthy of its support. The Government will be pleased to respond to any environmental issues raised by Members in debate at Third Reading.
- 1.7 Under the Environmental Impact Assessment (EIA) Directive (2014/52/EU) (“the EIA Directive”), decision making bodies are required to consider the environmental effects of projects when deciding whether they should be allowed to proceed. The objective of the EIA Directive is to identify and assess the likely significant environmental effects of a project. The intention is for this to inform the decision making body as part of the development consent process.
- 1.8 In the case of the HS2 Phase 2a Bill, the objectives of the EIA Directive, including that of supplying information, are achieved through the parliamentary process. Standing Order 27A requires that, when a Bill which authorises the carrying out of works is submitted for approval through the parliamentary process, it shall be accompanied by an Environmental Statement (ES) containing specified information. The ES is a document provided to enable Parliament to make an assessment of the likely impacts on the environment arising from the project. The ES also provides stakeholders and the public with a basis on which to make representations to Parliament, as appropriate, on the environmental impacts of the project.
- 1.9 When the HS2 Phase 2a Bill was first introduced to Parliament, it was accompanied by an ES. That ES describes the findings of the assessment of the likely significant environmental effects (both negative and positive) which has been undertaken for the HS2 Phase 2a project on behalf of the Promoter. The aim of the assessment has been to:
- identify the potential significant environmental effects associated with the construction and operation of HS2 Phase 2a;
 - identify measures to mitigate adverse significant effects; and
 - predict the magnitude and significance of any effects which will remain.

1.10 The term ‘the main ES’ is used in cases to refer specifically to the ES as originally produced (with its Non-Technical Summary (NTS)) when the HS2 Phase 2a Bill was introduced in July 2017.

1.11 The main ES is comprised of the following documents:

- NTS: which provides a summary in non-technical language of HS2 Phase 2a. It sets out the likely significant environmental effects, both beneficial and adverse, and the means to avoid, prevent or reduce the adverse effects;
- Volume 1: Introduction to the ES and the Proposed Scheme. This describes HS2, and the environmental impact assessment process and the approach to consultation and engagement. It gives details of the permanent features and general construction techniques as well as a summary of the reasonable alternatives considered;
- Volume 2: Community area (CA) reports and map books. There are 5 CA reports and associated map books which present the likely significant environmental effects of HS2 Phase 2a along the proposed route. It also sets out the proposed means to avoid, prevent or reduce these effects;
- Volume 3: Route-wide effects. This describes the likely significant environmental effects of HS2 Phase 2a on a route-wide basis and the proposed means to avoid, prevent or reduce these effects;
- Volume 4: Off-route effects. This describes the likely significant off-route environmental effects of HS2 Phase 2a beyond those within the CA descriptions in Volume 2. It also sets out the proposed mitigation measures and likely significant residual effects; and
- Volume 5: Appendices and map books. This contains supporting environmental information and associated map books.

1.12 Throughout the development of HS2 Phase 2a, there has been extensive consideration of alternatives. ES Volume 5 includes an ‘Alternatives Report’ that describes the evolution of the HS2 Phase 2a scheme. It summarises the objectives and requirements and identifies the strategic, route-wide rail and rail corridor alternatives between the West Midlands and Crewe. In each case it explains why the decisions were made, taking account of environmental considerations. In addition, the ES Volume 2: CA Reports include details of the main local alternatives considered.

1.13 Since the deposit of the HS2 Phase 2a Bill, the Promoter has submitted:

- two further environmental statements (‘the AP ESs’) produced following amendments to HS2 Phase 2a requiring two Additional Provisions⁵; and
- two supplementary environmental statement (‘the SESs’) submitted for changes which, although not themselves requiring amendments to HS2 Phase 2a Bill powers, altered the significant environmental effects of HS2 Phase 2a, so required the publication of supplemental environmental information.

1.14 The details of these AP ESs and SESs are provided in Annex B. The format of these AP ESs and SESs follows that of the main ES (see paragraph 1.10). Unless the context otherwise requires, the term ‘Environmental Statement’ and ‘ES’ in this paper

⁵ An Additional Provision is an amendment to extend powers contained in the HS2 Phase 2a Bill, which affect private interests.

refers to the entire suite of documents listed in the table in Annex B, which together comprise the HS2 Phase 2a ES.

- 1.15 The Standing Orders for Private Business of each House of Parliament apply to hybrid bills. Following the deposit of the HS2 Phase 2a Bill and the two APs, compliance with these Standing Orders was assessed by the Examiners of Petitions for Private Bills. This was then reported to the Commons and Lords Standing Order Committees. These Committees then determined that deposit of the HS2 Phase 2a Bill and each AP in turn were compliant with the applicable Standing Orders.
- 1.16 In addition, following the deposit of each of the main ES and the two AP ESs and SESs, an independent public consultation was carried out by the Promoter. An Independent Assessor, Golder Associates, was appointed by Parliament to produce reports summarising the issues raised in the responses to these consultations⁶. A list of these reports is contained in Annex B. Copies have been placed in the House Library.
- 1.17 The ES accompanying the HS2 Phase 2a Bill complies with all UK and EU legal requirements. The ES has been developed in accordance with the accepted best practice methodologies recommended by a range of UK institutional bodies. The document has satisfied the requirements for Parliamentary deposit and the HS2 Phase 2a Bill has secured its Second Reading in both the Commons and the Lords.
- 1.18 This Statement of Reasons is not intended to take the place of the NTS of the HS2 Phase 2a ES or, indeed, the ES itself. The Promoter therefore advises Members to consult the main ES, the two AP ESs and the two SESs deposited with Parliament. Details of the official title of each document and the date deposited in the Private Bill Office in each House of Parliament is provided in the table in Annex B. Each was accompanied by an NTS deposited on the same date.
- 1.19 In addition to considering the ES, Members should also consider the views expressed in:
 - responses to the consultations on the main ES, SESs and AP ESs, which are summarised in the Independent Assessor reports referred to in paragraph 1.16 above. A list of these reports is contained in Annex B;
 - the Commons First Special Report of the High Speed Rail Bill Committee, Session 2017-19, on the HS2 Phase 2a Bill, HC 1085, published on 24 May 2018, along with the Promoters response, published on 25 June 2018;
 - the Commons Second Special Report of the High Speed Rail Bill Select Committee, Session 2017-19, on the HS2 Phase 2a Bill, HC 1452, published on 23 July 2018, along with the Promoters response, published on 13 November 2018; and
 - the Commons Third Special Report of the High Speed Rail Bill Select Committee, Session 2017-19, on the HS2 Phase 2a Bill, HC 2270, published on 7 June 2019.
 - The Lords Select Committee Special Report of Session 2019-21 HL Paper 149, published on 19 October 2020, and the Government's Response, published alongside this document.
- 1.20 Members may also wish to examine the various Information Papers ('IPs') that have been produced. These address some of the more frequently raised issues in relation to the HS2 Phase 2a project, including its environmental impacts. A list of these IPs

⁶ The Independent Assessor was appointed under the Private Business Standing Orders of the House of Commons, by the Examiners of Petitions for Private Bills, a group of impartial parliamentary officials acting for both Houses of Parliament.

is contained in Annex B along with other documents and sources of information that we consider may be relevant.

2. Need for and Benefits of HS2 Phase 2a

- 2.1 The Government is committed to building a stronger, more balanced economy capable of delivering lasting growth and widely shared prosperity. The strategic case for HS2⁷ (October 2013) set out how HS2 would meet Government's objectives:
- to provide sufficient capacity to meet long term rail demand, and to improve resilience and reliability and the railway network;
 - to improve connectivity by delivering better journey times and making travel easier;
 - and therefore boosting economic growth across the UK.
- 2.2 The Government has firmly established the capacity challenge that exists on our rail network. The need for additional capacity will become increasingly pressing on Britain's key north-south inter-urban rail routes, particularly on the West Coast Main Line (WCML) from the mid-2020s. This will result in increased overcrowding significantly above today's levels and decreasing levels of resilience and reliability.
- 2.3 The Government carefully considered a range of alternatives to HS2, which include:
- upgrades to the existing rail network;
 - the use of alternative modes;
 - a new conventional speed railway line; and
 - rail alternatives to Phase 2a.
- 2.4 The Government has established that these alternatives do not deliver the same transformational effects upon capacity and connectivity as HS2 and therefore fail to achieve our overarching economic aim.
- 2.5 Further incremental upgrades to the existing north-south rail network will be insufficient to provide the necessary capacity and improved performance required to meet the country's long-term economic needs. They would also result in prolonged and unacceptable disruption to the existing network. Thus, a new railway line is needed to meet these objectives.
- 2.6 The Government has concluded that building new conventional rail lines would not be significantly cheaper than new high speed lines, nor would their effects on the environment and communities be significantly less than those of high speed rail. Conventional rail lines would also deliver far fewer benefits in terms of enhanced connectivity and support for long-term economic growth. The Government also considers that high speed rail would have greater potential to attract travellers from air and road transport, creating opportunities to reduce carbon emissions.
- 2.7 The case for HS2 fundamentally rests on the transformative impacts of the capacity and connectivity it will provide. Additional capacity is needed to meet increasing

⁷ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/260525/strategic-case.pdf

travel demands from a growing population and economy and improved connectivity to bring people and businesses together to support growth.

2.8 HS2 will transform the country, supporting growth in the north by improving connectivity. It will rebalance our economy, promote regeneration, boost local skills, generate tens of thousands of jobs and help to secure the UK's future prosperity.

2.9 The benefits of HS2 Phase 2a include:

- Delivering nearly £4bn of benefits in present value terms.
- The benefits of Phase 2a, including wider economic impacts, are estimated to outweigh the costs of building and operating the railway by a factor of 1.9.
- The creation of 1,920 full time construction jobs, 140 permanent jobs (e.g. from the maintenance base near Stone) and further jobs through suppliers of goods and services.
- By building Phase 2a earlier than planned, the cities in the north of England and Scotland will see the benefits of HS2 more quickly.
- Improvements to connectivity by delivering better journey times and making travel easier.
- The potential to support the efficient movement of people and freight, which is essential for economic growth. Enhanced capacity and good connectivity strengthen the links between businesses, workers and customers and will remove geographical barriers to markets.
- Creating opportunities for regeneration and by improving connectivity and in effect bringing cities closer together – opening up new markets, new job opportunities, and new opportunities for growth.
- Relieving pressure and releasing capacity on a particularly constrained section of the WCML. Six trains per hour can be transferred onto Phase 2a lines, freeing up capacity on the WCML from Lichfield to Crewe.
- Attracting passengers from private cars, reduce the number of road accidents and generate new public transport revenue.

2.10 It should also be noted that the full HS2 network is estimated to support up to 30,000 construction jobs and 3,000 permanent operation and maintenance jobs when operational.

2.11 For more information on the need for, and benefits of, Phase 2a see the Strategic Case for Phase 2a published in November 2015, the Strategic Case for Phase 2a published in July 2017 and Volume 1 of the main ES.

3. Role of the Select Committee

- 3.1 Before introducing the HS2 Phase 2a Bill to Parliament, the Promoter had already looked for ways to limit the likely environmental impacts of the HS2 Phase 2a project and to mitigate the adverse impacts that might be expected to arise (control and mitigation strategies are discussed further in the next section). However, the Promoter recognises that this is an ongoing process.
- 3.2 The Select Committee process in both Houses has been particularly important in bringing to light concerns about the impacts of the project at particular locations on the route and considering whether more should or can be done to address specific points of concern.
- 3.3 The HS2 Phase 2a Bill is a hybrid Bill and, as such, subject to a petitioning process. In total, 338 petitions were lodged against the HS2 Phase 2a Bill and its Additional Provisions (302 in the Commons and 36 in the Lords).
- 3.4 The Promoter was able to satisfy a significant number of petitioners without the need for a hearing before the Select Committee. In some cases, this involved making changes to the project to reduce impacts or enhance local mitigation measures, and many of these were included within one of the two Additional Provisions to the Bill deposited during the Commons Select Committee stage and the relevant Supplementary Environmental Statements.
- 3.5 As has been the case on previous hybrid Bills, the Lords Select Committee ruled that, in line with convention, it had no power to make an amendment to the Bill which would amount to an Additional Provision, unless they were instructed to do so by the House. No such instruction was received. Petitioners were given opportunity by the Lords Select Committee to make their case, but once it became clear that an Additional Provision would be required, the Committee considered that they could not support the petitioner's case in that instance.
- 3.6 In other cases, petitioners asked for commitments about the way in which the project would be taken forward (see also paragraph 4.15 below) or were reassured by policies already put in place to meet their concerns.
- 3.7 Those petitioners not satisfied with the Promoter's response were able to raise their concerns directly before the Select Committees. The Select Committees then reached a view on whether the Promoter's approach was reasonable in the particular circumstances of that case. In total the Commons Select Committee heard 145 petitions and the Lords Select Committee heard 18 petitions.
- 3.8 The Commons Select Committee considered the petitions of those directly and specially affected by the scheme. It also considered the amendments proposed by the Promoter to address those petitioners' issues and to improve HS2 Phase 2a. The Commons Select Committee was also responsible for scrutinising and approving a significant number of amendments to HS2 Phase 2a, as set out in the two Additional Provisions. Many of the changes brought forward were aimed, in whole or part, at reducing environmental impacts. Examples include:

- Lowering of the Kings Bromley and River Trent viaducts in the Staffordshire area by up to 3 metres, whilst maintaining the highways crossings under the viaducts.
- Relocation of the southern portal of Whitmore Heath tunnel further south beyond the A53 Newcastle Road, removing the need to realign the road or construct the A53 overbridge. This change also reduces the loss of ancient woodland from Whitmore Wood.
- Additional land for the reconfiguration of Ingestre Park Golf Club to replace the land lost and severed by the HS2 route, enabling the golf course to continue as a community asset.
- Additional land for the provision of a replacement facility for Mayfield Children's Home.
- Additional landscape earthworks in the vicinity of the Stone Infrastructure Maintenance Base – Rail (IMB-R), which will further screen and integrate the IMB-R into the surrounding landscape.
- Additional noise mitigation (through a noise bund at Woodhouse Farm).
- Highway and junction modifications and improvements and changes to construction routes to reduce traffic impacts at several locations.
- Realignment of a number of footpaths and bridleways to accommodate concerns raised by landowners.

3.9 The Commons Select Committee also considered, as part of the second Additional Provision, a proposed new electricity grid connection ("Parkgate"). This has been developed to meet power supply requirements for HS2 Phase 2a and to resolve issues of resilience in National Grid's overall supply in the surrounding area. The proposal will provide a new grid connection between Parkgate on the B5234, 1.5km west of Newborough and the Newlands Lane Auto Transformer Feeder Station. The design provides for an overhead line consisting of two parallel lines of steel pylons between 23m and 38m in height, for 7.7km.

3.10 Since petitioning for the Lords Select Committee closed in August 2019, over 153 further assurances have been issued. These provide binding commitments on the Secretary of State and bring the total number of individual assurances offered over the course of the two Select Committee stages to over 1500. Some of the additional assurances offered over the course of the Lords Select Committee hearings included:

- Enhancing the Phase 2a scheme's existing No Net Loss objective, by identifying and implementing appropriate opportunities, where it is reasonably practicable, to move towards net gains in biodiversity.
- Undertaking further traffic surveys on Yarnfield Lane to better understand current levels of use by cyclists and traffic speeds to inform the detailed design.
- Restricting HS2 Large Goods Vehicles from using Within Lane between its existing junction with the A518 Weston Road and the B5066 Sandon Road during the Construction Period.
- Contributing up to £350,000 towards the improvement of community facilities or the local environment in the Parish of Hopton and Coton.

4. General Approach to the Control and Mitigation of Environmental Impacts

- 4.1 Whilst HS2 Phase 2a would deliver significant socio-economic benefits (discussed in the latter sections of this paper) it is not possible to build a major public transport infrastructure project without creating some adverse significant effects on the environment on or near the proposed route. When considering the route of HS2 Phase 2a it was therefore necessary to balance a number of different considerations. This involved maximising the benefits whilst minimising the adverse significant effects and having due regard to other relevant factors such as implications for safety and affordability.
- 4.2 The implementation of HS2 Phase 2a would require the construction of the high speed railway line in tunnels, at surface level, in cuttings, on embankments and over bridges and viaducts. It will also require temporary construction worksites, the use of borrow pits⁸ and the construction of electricity power connections. The choice of route for HS2 Phase 2a and its design has been informed by numerous consultations with local communities, relevant authorities and a detailed assessment of its environmental effects.
- 4.3 In designing the route and strategies for controlling the impacts of constructing and operating the railway, the Promoter has sought to reduce or mitigate, as far as is reasonably practicable, the environmental impacts of the scheme. In particular those impacts that might affect people and communities, historic buildings, conservation areas, sensitive habitats and areas of natural beauty. The route itself is 58km long and will be in tunnel for 2.4km, in cutting or retained cutting below the natural ground level for 28.3km, on viaduct for 5.5km and on embankment for 21.3km. Noise fence barriers and/or landscaped earthworks have been introduced that will reduce railway noise and assist the railway to blend into the existing landscape.
- 4.4 HS2 Phase 2a has also sought to reduce or mitigate the impact of construction and operation on farmers and farm holdings, with a view to limiting the level of disruption to farming activities as far as reasonably practicable. The Commons Select Committee has made recommendations on changes to HS2 Phase 2a and for additional assurances to be given with that objective in mind. HS2 Ltd on behalf of the Promoter introduced further engagement with farmers and made a number of changes to HS2 Phase 2a, which are set out in the agriculture, forestry and soils section below.
- 4.5 During the HS2 Phase 2a Commons Select Committee proceedings, HS2 Ltd announced the development of a new Green Corridor initiative, which will promote ways for local people to enjoy the countryside. A network of habitats will be created along the HS2 Phase 2a corridor which will be utilised to provide new access routes

⁸ A borrow pit is an area where material, usually sand and gravel, is excavated for use in construction of a nearby infrastructure project.

and open spaces and promote and connect additional environmental assets beyond the railway.

- 4.6 The approach to mitigation adopted for HS2 Phase 2a has followed a hierarchy, whereby priority has been given to avoiding or preventing effects; and then (if this was not possible), to reducing or abating them, through restoration or compensation. In some cases, such measures may have longer term benefits to the environment, where new ecological habitat will be created joining up existing habitats (e.g. at Whitmore Wood). HS2 Phase 2a will create over 516ha of habitats of principal importance.
- 4.7 This section looks at the extent to which the Promoter expects to be able to avoid, prevent, reduce, offset, repair or compensate for significant adverse environmental impacts.
- 4.8 The design of HS2 Phase 2a to date provides the level of detail necessary for the purposes of the HS2 Phase 2a Bill and the requirements of the Environmental Impact Assessment Regulations. The level of detailed design necessary to enable HS2 Phase 2a to be constructed has yet to be carried out, and will not be completed until after the HS2 Phase 2a Bill has secured Royal Assent. Once it is complete the nominated undertaker will need to apply to local authorities along the route for approval of the detailed design of a range of elements of HS2 Phase 2a. This will allow local planning authorities to ensure that the design of permanent structures fits into the local environment. Local planning authorities will also be able to input into the approval of certain construction matters and have a level of control over their enforcement.
- 4.9 There will be a number of mechanisms in place to control the environmental impacts of HS2 Phase 2a. Some of these are contained within the HS2 Phase 2a Bill itself. For example, whilst the HS2 Phase 2a Bill effectively grants deemed planning permission for the HS2 Phase 2a project, this is subject to various requirements to obtain approvals of detailed matters. In particular, Schedule 17 of the HS2 Phase 2a Bill sets out the detailed approvals required from qualifying local planning authorities (and the grounds on which planning authorities may refuse approval and the sorts of conditions that they may impose as a condition of granting approval). The Promoter will issue statutory guidance for local authorities to pay due regard to when exercising their functions under Schedule 17. Also of note is Schedule 32, which contains provisions setting out protections for various bodies likely to be affected by the works. For example, Part 4 of Schedule 32 requires the project to obtain the approval of the Environment Agency before carrying out certain works, which might have an impact on flood risk or water quality.
- 4.10 The Promoter has also developed various control and mitigation strategies which fall outside of the HS2 Phase 2a Bill, most notably the Environmental Minimum Requirements (EMRs). The EMRs will consist of a Code of Construction Practice (CoCP), a Planning Memorandum, a Heritage Memorandum, an Environmental Memorandum and the undertakings and assurances given to Parliament and to petitioners during the passage of the HS2 Phase 2a Bill.
- 4.11 The Environmental Memorandum covers how the nominated undertaker will address environmental issues such as ecology and nature conservation, landscape and water resources. It also looks at the wider strategy for addressing those issues rather than merely the construction process itself (as the latter is covered by the CoCP). The EMR general principles includes the key requirement that the nominated undertaker must use reasonable endeavours to adopt mitigation measures that will further reduce any adverse environmental impacts caused by HS2 Phase 2a. This is subject

to those mitigation measures not adding unreasonable costs to the project or unreasonable delays to the construction programme.

- 4.12 The Planning Memorandum is primarily aimed at setting out an understanding between the Promoter and local authorities relating to the treatment of applications for detailed planning approvals under the HS2 Phase 2a Bill. The Heritage Memorandum provides the strategy to ensure that the design and construction of HS2 Phase 2a is carried out with due regard for heritage considerations. The CoCP deals with how the nominated undertaker and its contractors will address a broad range of construction related environmental issues including noise, vibration and air quality.
- 4.13 The EMR documents were published in draft when the HS2 Phase 2a Bill was deposited. They are being developed in consultation with local authorities and other key stakeholders and will be finalised by the time of Royal Assent. A list of the EMR documents is included in Annex B.
- 4.14 The controls contained in the EMRs are a key element of the Promoter's overall strategy for ensuring that impacts which have been assessed in the HS2 Phase 2a ES are not exceeded unless this:
- results from a change in circumstances which was not likely at the time of the ES; or
 - would not be likely to be environmentally significant; or
 - results from a change or extension to the project, where that change or extension does not itself require an Environmental Impact Assessment (EIA); or
 - would be subject to a separate consent process (and therefore a further EIA if required).
- 4.15 Many of the other undertakings and assurances that have been given during the parliamentary process also relate to the control and mitigation of environmental impacts. Some of these are route wide but many deal with very specific, local concerns. For example, undertakings and assurances have been given to:
- Staffordshire County Council to avoid the loss of veteran and ancient trees as a result of Phase 2a construction;
 - Yarlet School and Ingestre Care Home to provide additional controls to manage noise; and
 - Bentley Hall Farm to consider the introduction of a mitigation bund in detailed design to screen views of the railway.
- 4.16 In addition, the Promoter has given commitments to provide tailor-made support to businesses that will experience significant impacts as a consequence of the scheme. For example, undertakings and assurances have been given to:
- engage with Staffordshire County Showground regarding the timing and nature of HS2 works in the immediate vicinity in order to avoid disturbance to their event activities;
 - assist Ingestre Park Golf Club in securing the planning permission for their reconfigured course development; and
 - assist relevant farm business with business cases, in order to secure advance payments for accommodation works to limit business disturbance and early

acquisition and payment of compensation for their land required for the construction of the scheme.

- 4.17 So far, the Promoter has given over 1,500 undertakings and assurances in relation to HS2 Phase 2a. A draft register of all undertakings and assurances given thus far in the process (excluding those that have either been carried out already or which will be carried out during the passage of the HS2 Phase 2a Bill) has been produced and published at regular intervals, most recently on 24 June 2019. The register will continue to be updated as the HS2 Phase 2a Bill process continues, to include any further undertakings and assurances given. It will then be finalised after Royal Assent and the nominated undertaker will be required under the terms of the Development Agreement⁹ to comply with the undertakings and assurances recorded on the register.
- 4.18 In the event of a failure to comply with an undertaking contained in an agreement, the person with the benefit of the undertaking will have recourse to the courts. In the event of a failure to comply with any other registered undertaking or assurance, recourse will ultimately be through the Secretary of State, and the Secretary of State is answerable to Parliament for ensuring compliance.
- 4.19 Finally, in addition to the arrangements put in place specifically for HS2 Phase 2a, there are general legislative controls that will apply in the normal way, such as the existing requirements for construction noise, waste management licences and discharge consents. For example, prior consent will be required from local planning authorities to control construction noise under Section 61 of the Control of Pollution Act 1974.
- 4.20 More information on control and mitigation strategies as they apply to different types of potential effect is provided in the following section. It very briefly highlights the key mitigation measures that would be used and indicates whether significant effects would arise despite mitigation. In addition, a range of Information Papers (IPs) have been produced to address some of the more frequently raised issues in relation to the HS2 Phase 2a project, including its significant environmental effects. A list of all the IPs can be found at Annex B, but see in particular IP D3: Code of Construction Practice and E1: Control of Environmental Impacts.

Agriculture, forestry and soils

- 4.21 Agriculture is the most common land use along the HS2 Phase 2a line of route. In developing HS2 Phase 2a, HS2 Ltd on behalf of the Promoter has sought to minimise the adverse significant environmental effects on agricultural holdings as far as is reasonably practicable. HS2 Ltd employed specialists in agriculture to visit farms and discuss the effects of HS2 Phase 2a with individual farmers and land owners. The information gathered was taken into account in the design of HS2 Phase 2a, particularly in respect of the provision of accommodation bridges and underpasses to maintain access to land. It also helped in the development of compensation for the loss of land and replacement of farm buildings.
- 4.22 HS2 Ltd has published a HS2 Phase 2a Farmers and Growers Guide which explains the Promoters policies on agricultural property matters. It covers the relocation of farm buildings and facilities, the acquisition or occupation of land, and compensation. It also covers construction activity, accommodation works, access, fencing, land

⁹ The Development Agreement governs the relationship between the Secretary of State for Transport and HS2 Ltd. It sets out HS2 Ltd's role in developing, building and operating the new High Speed Railway and the Department for Transport's role as sponsor and funder.

restoration, land drainage and floodplain replacement. The guide will include a bespoke farmer's record of the undertakings and assurances made in respect of each holding.

- 4.23 The aim of the HS2 Phase 2a Farmers and Growers Guide is to explain the policies currently proposed by HS2 Ltd on behalf of the Promoter on agricultural property matters. This will help in the preparation for the next stages of the design, construction and operation of the new railway. The guide also details the assurances that have been given to the National Farmers' Union (NFU) and the Country Land and Business Association Limited (CLA). These specify that the nominated undertaker will seek to minimise the loss of Grade 1, 2 and 3a agricultural land to HS2 Phase 2a through detailed design, as well as to accommodate reasonable proposals from owner/tenants to modify the detailed design of works and ecological mitigation to facilitate the efficient management of agricultural holdings.
- 4.24 Further assurances have been given to the NFU stating that:
- Agreed or determined compensation payments for the compulsory acquisition of agricultural land / rural businesses will be paid promptly.
 - There will be written notice given ahead of the nominated undertaker taking temporary possession of agricultural land.
 - Where existing private water supplies to farms are affected, if requested by a farm or landowner, the nominated undertaker will, where reasonably practicable, meet the reasonable cost of providing an alternate supply.
- 4.25 The Promoter has written to farmers whose land holdings were identified for new or revised ecological mitigation since deposit of the HS2 Phase 2a Bill. These letters set out the proposed mitigation and its justification, the rationale for its location, and the further engagement planned during the detailed design stage of HS2 Phase 2a. An extensive programme of engagement meetings was also held with landowners affected by the changes to HS2 Phase 2a, giving opportunities to raise and address concerns.
- 4.26 A concern often expressed by farmers was the impact of environmental mitigation combined with the local placement of surplus excavated material on their land holdings. In response, the Promoter has looked to amend HS2 Phase 2a design where reasonably practicable. The Promoter has also offered assurances to relocate local placement sites to alternative locations or to combine these areas with environmental mitigation to reduce the total land required, where reasonably practicable. Examples of such assurances include:
- The assurance given to the landowners of Tithebarn Farm which seeks to use an alternative area of land, already proposed for woodland habitat creation, to accommodate the local placement proposed within their land holding.
 - The assurance given to the landowner of Upper Hanyards Farm which seeks to relocate an area of local placement and woodland habitat creation to an alternative site.
 - The assurance given to the landowner of Yew Tree Farm which seeks to relocate an area of local placement, a temporary stockpile and woodland habitat creation mitigation to an alternative site.
- 4.27 For the construction phase, the draft CoCP has been developed which sets out the aim of mitigating impacts on soils, farms and farm-based businesses. The draft CoCP will evolve and is subject to refinement, amendment and expansion during the

passage of the HS2 Phase 2a Bill through Parliament. The final version of the CoCP will be produced at the point the HS2 Phase 2a Bill achieves Royal Assent.

- 4.28 The draft CoCP includes provisions to protect agricultural land adjacent to construction sites, to reinstate agricultural land used temporarily during construction and to set out a method for the management and restoration of soils. A commitment has also been made to the NFU and CLA that during construction on agricultural land, the nominated undertaker will ensure there is an agricultural liaison service with officers experienced in agricultural matters in place and contactable by telephone 24 hours a day, 7 days a week.
- 4.29 Individual assurances have also been given to consult landowners regarding the location of overhead electricity pylons and to maintain access to land, where reasonably practicable, associated with the proposed Parkgate grid connection. Where possible, pylons have been placed at the edge of field boundaries, avoiding roads and crossings over watercourses to minimise impacts on agriculture, connectivity and water resources.
- 4.30 Further information on this subject can be found in IP C2: Rural Landowners and Occupiers Guide.

Air quality

- 4.31 There are no significant air quality effects expected on a route wide basis for the construction of the HS2 Phase 2a scheme or the operation of the trains on the completed high speed railway. During construction, highway construction traffic will cause temporary significant effects for local air quality in a limited number of locations, but this is confined to the M6 corridor. These effects are from increases in nitrogen dioxide concentrations.
- 4.32 The draft CoCP contains a wide range of measures to manage air quality at construction sites and from construction vehicles. These include measures to manage dust, such as erecting temporary hoardings at construction sites, the covering of material stockpiles and the control of construction equipment exhaust emissions. Minimum emission standards will be implemented for construction vehicles and best practice targets set for the emissions performance of contractor vehicles on the road.
- 4.33 In addition, the Promoter has committed the nominated undertaker to further specific air quality control measures. For instance, an assurance that all HGVs used for the construction of HS2 Phase 2a will comply with the EURO VI standard, subject to recognised exemptions (see IP E14: Air Quality). Where temporary, significant air quality effects due to HS2 Phase 2a are predicted to occur, these will be managed through the CoCP. Any such effects will be measured, reviewed periodically and be managed through the development of action plans to address the significant effect, with the objective of removing them as soon as and as far as reasonably practicable.
- 4.34 Further information on this subject can be found in IPs E3: Management of Traffic During Construction, D3: Code of Construction Practice, E14: Air Quality and E22: Mitigation of Significant Community Effects on Public Open Space and Community Facilities

Climate change

4.35 Climate change has been assessed in the HS2 Phase 2a ES in three ways:

- a Greenhouse Gas (GHG) assessment;
- an in-combination climate change assessment; and
- a climate change resilience assessment.

4.36 The GHG emissions associated with the construction and operation of HS2 Phase 2a are reported in the form of the carbon footprint, reported in tonnes of carbon dioxide equivalent (tCO₂e). The in-combination climate change assessment identified any significant effects for relevant ES topics during construction and operation. The climate change resilience assessment assessed potential climate hazards and risks for HS2 Phase 2a infrastructure and assets to the end of their design life taking into account existing or embedded mitigation measures.

4.37 The residual carbon emissions of the combined operational and construction carbon footprints of HS2 Phase 2a are estimated to be 1,459,000 tCO₂e. To put this into context, HS2 Phase 2a's annualised construction emissions (against the Green Construction Board's 2026 projected UK construction sector as a whole) shows that HS2 Phase 2a's contribution is less than 1% of the projected 2026 total UK construction carbon emissions.

4.38 The Government is establishing a UK Emissions Trading Scheme within which the carbon emissions associated with the construction and operation of HS2 Phase 2a will be regulated. This means that, overall, most of HS2 Phase 2a's carbon emissions will not contribute to an increase in UK Wide carbon emissions.

4.39 To address carbon emissions, HS2 Ltd's Environmental Policy¹⁰ states an aim to "minimise the carbon footprint of HS2 and deliver low carbon, long distance journeys that are supported by low carbon energy". HS2 Ltd on behalf of the Promoter has applied the following carbon minimisation hierarchy:

- calculate the carbon footprint of HS2 Phase 2a and use this as a tool to assess the potential to reduce carbon across the design, construction and operational phase;
- consider low carbon options in developing the detailed design of HS2 Phase 2a;
- reduce embedded carbon in construction materials and carbon emissions from construction works, where practicable;
- reduce energy requirements of HS2 Phase 2a and maximise the energy efficiency of operations, if reasonably practicable;
- use and/or generate low carbon energy, if reasonably practicable; and
- sequester carbon, if reasonably practicable.

4.40 The significant passenger capacity of HS2 Phase 2a, combined with its ability to draw power from an increasingly decarbonised national grid, means that it will be an effective low carbon transport solution for travel between the West Midlands and Crewe when operational. In terms of CO₂ equivalent emissions in grams per passenger kilometre (gCO₂/pkm), HS2 Phase 2a will emit 10 gCO₂e/pkm as

¹⁰ <https://www.gov.uk/government/publications/hs2-environmental-policy>

compared to interurban cars (67 gCO₂e/pkm); intercity rail (22 gCO₂e/pkm¹²) and UK domestic flights (170 gCO₂e/pkm), based on projected carbon emissions in 2030.

- 4.41 HS2 Ltd on behalf of the Promoter has considered how climate change, in combination with the impacts of HS2 Phase 2a, may affect communities, businesses and the natural, historic and built environment along the HS2 Phase 2a route. Mitigation measures have been introduced into the design of HS2 Phase 2a and include:
- Ecological mitigation measures which will enable habitats to adapt to climate change by maintaining and enhancing ecological conditions and creating and restoring habitats to increase species' resilience to changes in climate.
 - Trees which will be selected from a range of latitudes and climate zones to increase species' resilience to hotter, drier and/or wetter conditions, and landscape planting which will be designed to increase species' resilience and adaptability.
 - The performance of HS2 Phase 2a has been assessed against a range of design floods up to and including the 1% (1 in 100) annual probability event, including the addition of the relevant future climate change allowances in line with the latest guidance from the Environment Agency.
- 4.42 No significant climate change resilience effects have been identified for the construction or operation of HS2 Phase 2a. This is due to a range of mitigation measures that are either already embedded within the design; or to be included in the development of maintenance and monitoring procedures; or to be developed during future design stages. Examples of such mitigation measures include:
- HS2 Phase 2a is designed to the 1 in 100 year plus climate change allowance peak river flow event. In addition, the railway infrastructure will be protected from the 1 in 1000 year peak river flow event, ensuring that HS2 Phase 2a can return to operation without undue delay.
 - Lineside vegetation and landscape planting areas will be managed to minimise the likelihood of windborne debris blocking watercourses and drainage systems, obstructing the tracks or causing damage to overhead line equipment.
- 4.43 Risks relating to the impact of extreme weather events and related conditions during the construction stage will be addressed in the CoCP. Climate change resilience assessments will continue to take place throughout the design, construction and operation stages of HS2 Phase 2a.
- 4.44 Further information on this subject can be found in IPs D3: Code of Construction Practice, E26: Climate Change Adaptation and Resilience and E27: Carbon.

Community and socio-economics

- 4.45 HS2 Phase 2a will bring socio-economic benefits to many communities through encouraging the development of skills, the creation of jobs and encouraging regeneration. HS2 Phase 2a is expected to directly create 1,920 full time construction jobs, 140 permanent jobs (e.g. from the maintenance base near Stone) and further jobs through suppliers of goods and services.
- 4.46 Throughout the design of HS2 Phase 2a, HS2 Ltd on behalf of the Promoter has tried to minimise or remove significant negative community and socio-economic effects. For example, the provision of a replacement residential facility for Mayfield Children's

Home, currently located at Moreton House in the Colwich to Yarlet area and the reconfiguration of Ingestre Park Golf Club.

- 4.47 There are areas along the line of route where adverse community impacts remain, including the demolition of dwellings and impacts to community facilities, along with the displacement of businesses and the effects of construction traffic. To mitigate these residual effects, a number of measures have been made through changes to HS2 Phase 2a policies, through the provision of assurances, through recommendations made by the Select Committees and through changes to HS2 Phase 2a via Additional Provisions.
- 4.48 The landowners whose land is compulsory purchased or who suffer an interference with an enjoyment of their land, known technically as “injurious affection”, from HS2 Phase 2a are provided for under the Compensation Code. The Compensation Code is not a single document but a collective term used for the principles set out in Acts of Parliament, principally the Land Compensation Act 1961, the Compulsory Purchase Act 1965, the Land Compensation Act 1973, the Planning & Compulsory Purchase Act 1991, the Planning & Compulsory Purchase Act 2004 and the Neighbourhood Planning Act 2017. This is supplemented by case law, relating to compensation for compulsory acquisition.
- 4.49 For businesses, besides existing statutory provisions, such as those provided by the national Compensation Code, the Promoter has committed to a range of additional measures. These are designed to enable businesses to continue to operate during construction, to remain in situ for as long as reasonably practicable, and to support them in making planned relocations. The Promoter will also consider providing up to 90% of the nominated undertaker’s estimate of compensation in advance of taking possession to assist with the cost of relocation. These measures, which are normally subject to a business case and adequate security being provided, should minimise the number of jobs lost permanently or displaced as a consequence of HS2 Phase 2a.
- 4.50 The Promoter has created the HS2 Community and Business Funds to add benefit over and above committed mitigation and statutory compensation to communities and local economies along the HS2 route demonstrably disrupted by the construction of HS2. A combined total of £40 million has been made available for HS2 Phase One and the Government has committed a further £5 million to be made available for HS2 Phase 2a. The Business and Local Economy Fund will focus on projects or programmes across business sectors and its aim is to have a positive effect on local economies. The Community and Environment Fund will have two types of grant, one focusing on quality of life and environment in individual communities and one focusing on large projects across several communities and addressing strategic concerns. The kinds of projects such funding will be available for include the enhancement of sports and recreational facilities, new community facilities and enhancements to public open space.
- 4.51 Beyond this, negotiations with stakeholders and recommendations from the House of Commons Select Committee have led to the introduction of measures for the scheme to support local communities such as:
- Introduction of a temporary haul route in the Parish of Mavesyn Ridware to enable construction traffic to avoid sensitive receptors, including the Henry Chadwick School.
 - Introduction of a new access for the Yarlet Trust School situated between Stone and Stafford.

- Additional traffic calming measures in the village of Woore to reduce speeds and improve pedestrian safety.

4.52 Where it has been reasonably practicable to support a positive community legacy, the Promoter has sought to do so through assurances and changes to the design of HS2 Phase 2a. For example:

- The creation of a new footway along Ingestre Park Road, within the Parish of Tixall and Ingestre.
- Contributing up to £350,000 towards the improvement of community facilities or the local environment in the Parish of Hopton and Coton.
- Enhancement to the design of HS2 Phase 2a's drainage system in order to improve local flood risk in the Parish of Colwich.

4.53 Further information on this subject can be found in IPs G1: Consultation and Engagement, G2: Community Engagement, C11: The Community and Environment Fund and Business and Local Economy Fund and E22: Mitigation of Significant Community Effects on Public Open Space and Community Facilities.

Cultural heritage

4.54 The draft CoCP provides mechanisms to minimise the impact of works on all heritage assets. The Heritage Memorandum sets out the Promoter's commitment to the historic environment (including heritage assets and their setting) during the design and construction of HS2 Phase 2a. It provides a framework for the nominated undertaker, Historic England, local authorities and other stakeholders to work together to ensure that the design and construction of HS2 Phase 2a is carried out with due regard for heritage assets.

4.55 Phase 2a will not require the demolition of any Grade I or Grade II* listed buildings. Schedule 18 to the HS2 Phase 2a Bill disapplies elements of the Planning (Listed Buildings and Conservation Areas) Act 1990. In relation to listed buildings directly affected by HS2 Phase 2a works, those proposed for demolition, alteration or modification are named in Table 1 of Schedule 18. The listed buildings named in Table 2 of Schedule 18 are those where noise mitigation works may be required. It is proposed that a series of Heritage Agreements will be made with each affected local authority and with Historic England, in respect of the listed buildings in Tables 1 and 2 of Schedule 18.

4.56 Historic environment studies were undertaken as part of the environmental impact assessment for HS2 Phase 2a. They included site reconnaissance, remote sensing and non-intrusive surveys to identify the presence of archaeological sites. The nominated undertaker will develop an investigation programme to deliver all historic environment works identified in the ES. Following the completion of heritage investigations, the records generated and the artefacts and samples collected will be assessed and analysed. The results of that work will be published via a range of media and approaches, which will be developed with Historic England and the relevant local authority.

4.57 Burial grounds have been avoided as far as practicable during the development of the HS2 Phase 2a design and no works are expected to have a direct impact on any known burial grounds. In the event that a burial ground is encountered during construction, every attempt will be made to limit the impact on the burial ground during the development of the detailed scheme design. All human remains affected

by HS2 Phase 2a works will be afforded due dignity, care and respect. Where any human remains and monuments to deceased persons require removal as a result of HS2 Phase 2a, those remains must be removed in accordance with the requirements specified in Schedule 20 of the HS2 Phase 2a Bill.

- 4.58 For further details see IPs D3: Code of Construction Practice, E24: Archaeology and E25: Burial Grounds.

Ecology and biodiversity

- 4.59 HS2 Phase 2a has been designed to avoid or reduce adverse significant effects on habitats, protected species and other features of ecological value, where reasonably practicable. For example, one of the key considerations in determining the alignment for HS2 Phase 2a in the section to the north of Rugeley and east of Stafford was to avoid impacts to Pasturefields Special Area of Conservation (SAC). Pasturefields SAC is internationally important and comprises the last remaining significant example of a natural inland salt spring with marsh habitats in the UK. HS2 Phase 2a will not directly affect any internationally designated sites.
- 4.60 Where adverse significant effects cannot be avoided, mitigation and compensation measures have been included to reduce effects on species and habitats. These measures will include translocation of species, the provision of replacement habitat and special measures such as underpasses and green bridges to facilitate the movement of species across the route. Examples of this include the Ingestre green overbridge and Swynnerton Estate North green overbridge.
- 4.61 The incorporation of ecological mitigation into the HS2 Phase 2a design has also been balanced with the need to reduce or mitigate impacts on farmers and farm holdings and to limit the level of disruption to farming activities as far as reasonably practicable. The Select Committee has made recommendations on changes to HS2 Phase 2a and for additional assurances to be given with that objective in mind. Further information on this is set out in the agriculture, forestry and soils section above.
- 4.62 Ancient woodlands are irreplaceable and HS2 Phase 2a is designed to avoid their loss, where reasonably practicable. Of the 11 ancient woodland sites directly impacted by the construction of the scheme, the area of loss has been reduced to 9.8ha in the AP2 revised scheme, compared to 10.5ha in the Bill scheme. In order to partly compensate for the loss of 9.8ha of ancient woodland, 78ha of woodland habitat creation is proposed, along with the translocation of up to 9.6ha of ancient woodland soils; and the restoration of a further 13.4ha of existing ancient woodland. In addition, HS2 Ltd has committed to a £2m Woodland Fund. This funding will help local landowners create native broadleaf woodlands and restore ancient woodland sites.
- 4.63 HS2 Phase 2a will continue to seek to avoid or further reduce significant environmental effects through the detailed design of the scheme, the implementation of the CoCP, and through implementing assurances. For example:
- A commitment to Staffordshire Wildlife Trust to consult on additional mitigation to mitigate residual effects on Lion Lodge Covert Salt Marsh and Lount Farm Local Wildlife Site.
 - A commitment to Cheshire Wildlife Trust to engage on the proposed mitigation to mitigate the effects on Water Vole in the Swill Brook.

- 4.64 HS2 Ltd on behalf of the Promoter has also routed the pylon corridor for the proposed new Parkgate grid connection to minimise tree loss (particularly protected and large mature trees) where reasonably practicable. Where possible, pylons have been placed at the edge of field boundaries, avoiding roads and crossings over watercourses.
- 4.65 The Promoter will ensure that for Phase 2a the majority of seed stock for tree planting is sourced from within Great Britain whilst maintaining the best opportunity for resilience to climate change. A commitment has been made to Natural England that the Promoter will use reasonable endeavours to source at least two thirds of the required seed stock from Great Britain and will consult Natural England and the Forestry Commission to ensure the remaining third is procured from an appropriate region of provenance.
- 4.66 The Promoter's stated ambition is to seek to achieve 'no net loss' in biodiversity on a route-wide basis. To measure losses and gains of habitats, a metric was developed in consultation with Defra and Natural England. The interim results derived from the metric indicates an estimated loss of 17% of biodiversity units based on the value of area based habitats. The ES methodology takes a precautionary approach in assessing environmental effects and identifying mitigation and this is reflected in the no net loss calculation, which is a worst-case estimate.
- 4.67 As the project progresses through detailed design it will seek to further reduce impacts and identify new opportunities to address the deficit. There are many opportunities to improve the balance of biodiversity units generated by HS2 Phase 2a through detailed design, construction and operation. Key opportunities include:
- Reducing the scale of habitat loss. The current no net loss calculation is based on the precautionary assumption that all habitat within the land required will be lost. In practice it will be possible to retain some habitats. For example, it will be possible to retain the majority of habitats within the land required for the grid connection at Parkgate and by retaining hedgerows in areas required temporarily during construction.
 - Enhancing the ecological value of mitigation planting provided primarily for landscape and visual impact, e.g. by increasing the commitment to manage areas of woodland planting and thereby increasing the biodiversity units generated.
 - Additional habitat creation or enhancement. HS2 Ltd on behalf of the Promoter is reviewing additional options for habitat creation and enhancement on land within the scheme, opportunities on land acquired by HS2 Ltd that is not required for the operation of the scheme, and opportunities at third party sites.
 - Including benefits to biodiversity which may be realised through the implementation of the assurances given to the National Trust or Cheshire East Council to fund environmental enhancements outside of HS2 Phase 2a Bill limits.
- 4.68 The No Net Loss calculation does not include areas of irreplaceable habitat such as ancient woodland, and associated compensation measures. Thus, large areas of woodland created as compensation for ancient woodland losses are unable to be counted in the calculation.
- 4.69 As well as opportunities to address the No Net Loss deficit, the Promoter has committed to ways of going further on biodiversity. A commitment has been given to the Royal Society of Wildlife Trusts to enhance the Phase 2a scheme's existing No Net Loss objective, by identifying and implementing appropriate opportunities, where it is reasonably practicable, to move towards net gains in biodiversity. An additional

£2 million of funding for biodiversity improvements (delivered alongside the Community Environment Fund) will be used to promote and enable the creation and enhancement of habitats along the line of route by third parties. The third-party projects funded in this way will further contribute to HS2 Phase 2a's biodiversity objectives.

- 4.70 Where ecological mitigation is created along the HS2 Phase 2a route, commitments have been made on measures to manage, maintain and monitor the performance of those habitats to ensure the objectives of the proposals for nature conservation are achieved. As identified in IP E2: Ecology, an Ecology Review Group, comprised of relevant statutory bodies, non-governmental organisations and local authorities, will review the outputs of monitoring for habitat creation sites and make recommendations for remedial action where appropriate. The interim no net loss results have been shared with relevant stakeholders likely to make up the Ecology Review Group when it is formed at Royal Assent.
- 4.71 For further information see IPs E2: Ecology, E28: Green Infrastructure and the Green Corridor and D3: Code of Construction Practice.

Health

- 4.72 Health is a new EIA topic introduced into the HS2 Phase 2a ES as a result of Directive 2014/52/EU. The definition of health used in the assessment follows that of the World Health Organization, which describes health as “a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity”. The health status of a population is governed in part by a wide range of environmental, social and economic determinants, which HS2 Phase 2a can affect. Local impacts assessed for HS2 Phase 2a include:
- Neighbourhood quality.
 - Access to services, health and social care.
 - Access to green space, recreation and physical activity.
 - Education.
 - Social capital.
- 4.73 Route wide impacts assessed for HS2 Phase 2a include:
- Employment and income.
 - Housing.
 - Transport (traveller stress and road safety).
 - Sound, noise and vibration.
- 4.74 Consideration of potential health issues has been an integral part of the planning and design of HS2 Phase 2a, alongside other environmental, community and economic issues. Adverse effects on health determinants have been reduced as far as reasonably practicable through mitigation measures, which have been incorporated into the design of HS2 Phase 2a. The mitigation measures which have been introduced for Phase 2a include:
- Reducing the loss of property and community assets, as far as reasonably practicable.

- Design of the track and track bed to avoid or reduce ground-borne noise and vibration.
- Provision of noise fence barriers and bunds to provide acoustic screening.

4.75 The design of HS2 Phase 2a has also reduced the impacts of construction traffic through:

- The introduction of site haul routes adjacent to the HS2 Phase 2a route to reduce the number of HGV movements on the public highway.
- Borrow pits¹¹ have been introduced to reduce HGV movements on the local road network.
- A temporary railhead will be provided near Stone to enable materials and equipment for the construction of HS2 Phase 2a to be transported by rail where reasonably practicable and thereby reduce HGV road movements.

4.76 The nominated undertaker will be required to comply with the EMRs for HS2 Phase 2a, including the CoCP. The CoCP will be the means of controlling the construction works associated with HS2 Phase 2a to ensure that the effects of the works upon people and the natural environment are reduced or avoided so far as reasonably practicable.

4.77 Other mitigation measures addressing health issues adopted for HS2 Phase 2a include:

- The nominated undertaker working with local authorities and communities on road safety during construction;
- Additional support for businesses needing to relocate to alternative premises as a result of HS2 Phase 2a; and
- Engagement with local businesses affected by HS2 Phase 2a, including farmers and growers, to identify reasonably practicable measures to avoid or reduce the loss of business resulting from impacts such as severance.

4.78 Following a recommendation by the Commons Select Committee, the Promoter has also agreed to scope and commission an epidemiological¹² quantitative assessment of the impact of the construction and operation of HS2 Phase 2a, including on mental health and wellbeing. This will also consider international best practice in the field. HS2 Ltd on behalf of the Promoter is now working with the National Institute for Health Research (NIHR) Public Health Research Board to commission an academic institution to undertake the long-term study, which is expected to commence in Spring 2021.

4.79 HS2 Ltd on behalf of the Promoter is committed to engaging appropriately with vulnerable stakeholders. This includes ensuring that front line staff receive appropriate training and support, and HS2 Ltd has a framework of services to provide its staff with expert advice and assistance in supporting vulnerable people. Given the potential for stress and anxiety to be caused as a result of planning blight and uncertainty during the route development process, not just during construction, HS2 Ltd has extended the scope to include an advocacy, support and wellbeing service for stakeholders.

¹¹ A borrow pit is an area where material, usually sand and gravel, is excavated for use in construction of a nearby infrastructure project.

¹² Epidemiology is the study and analysis of the distribution (who, when, and where) and determinants of health and disease conditions in defined populations

- 4.80 The Promoter agreed to review the criteria for compensatory funds such as the Community and Environment Fund and the Business and Local Economy Fund to ensure projects seeking to improve mental health and wellbeing were eligible for funding. The Promoter has confirmed it would welcome such bids for HS2 Phase 2A in due course when the funds open for applications after Royal Assent. HS2 Ltd on behalf of the Promoter will engage with health and wellbeing stakeholders to encourage and support applications for such projects.
- 4.81 For further information see IPs D3: Code of Construction Practice, E3: Management of Traffic During Construction, E9: Control of Airborne Noise, E10: Ground-borne Noise and Vibration and E13: Control of Construction Noise and Vibration.

Landscape and visual amenity

- 4.82 The proposed HS2 Phase 2a route has been developed to minimise its impact on landscape and visual amenity, and where possible to make a positive contribution to it. This includes the decision to keep the railway as low as reasonably practicable in the landscape and the use of earthworks and tree planting (screening) to help integrate the railway into the landscape and obscure new structures, trains and overhead line equipment.
- 4.83 As set out in paragraph 4.8, the design of HS2 Phase 2a to date provides the level of detail necessary for the purposes of the HS2 Phase 2a Bill. The level of detailed design necessary to enable HS2 Phase 2a to be constructed has yet to be carried out, and will not be completed until after the HS2 Phase 2a Bill has secured Royal Assent. Local planning authorities will gain powers to determine the detailed design and appearance of landscape earthworks under Schedule 17 of the HS2 Phase 2a Bill. With these powers, qualifying authorities will be able to refuse 'requests for approval' for the design or external appearance of relevant works where the design or external appearance would not 'preserve the local environment or local amenity'.
- 4.84 IP D1: Design, sets out the Promoter's approach to obtaining input from a wider range of stakeholders in the design of built and landscaped elements of the scheme. The policy seeks to ensure that amongst other considerations the scheme is designed to be sympathetic to local context and provides opportunities for engagement with local people on the design of main viaducts and maintenance buildings in sensitive areas.
- 4.85 Further revisions to the scheme have resulted in additional measures to reduce residual landscape and visual impacts. For example, the height of the Kings Bromley and River Trent viaducts have been lowered by up to 3.1m and 2.6m respectively and landscape mitigation planting has been provided on the eastern slope of the Bourne embankment.
- 4.86 Through the Commons Select Committee process, the Promoter has acknowledged the sensitivities of particular landscapes along the route and the need for greater collaboration with stakeholders on detailed design to improve the visual impact of the scheme. To facilitate this, assurances have been given to the National Trust to set up a group to address environmental issues for the Trent Sow Parklands and setting of the Cannock Chase Area of Outstanding Natural Beauty which will:
- provide advice and response on the design of the Great Haywood Viaduct, the Ingestre green overbridge, landscaped earthworks and planting design;

- develop design principles that could be applied to works in the area and achieve an exemplar landscape and viaduct design for the scheme; and
- work in partnership to identify and propose additional environmental enhancement measures outside of HS2 Phase 2a Bill limits.

4.87 These measures will be funded by the nominated undertaker up to a combined total value of £1.5 million.

4.88 Assurances have also been given to Cheshire East Council to make a fund available up to £850,000 to support the identification of further local environmental and landscape enhancements within the Cheshire East area in addition to those proposed in the ES.

4.89 For further details see the HS2 Design Vision¹³ and IPs D1: Design, E28: Green Infrastructure and The Green Corridor and E20: Maintenance of Landscaped Areas.

Sound, noise and vibration

4.90 The Promoter's approach to assessing, controlling and monitoring sound, noise and vibration from the construction and operation of HS2 Phase 2a, is set out in Information Papers (IPs) (see paragraph 4.95 below). The approach to these matters set out in the IPs describes the application of the aims set out in the Noise Policy Statement for England (NPSE) published in 2010, which requires the setting by the Promoter of Lowest Observable Adverse Effect Levels (LOAELs) and Significant Observable Adverse Effect Levels (SOAELs) for noise and vibration.

4.91 The LOAELs for operational noise have been derived with consideration of the World Health Organisation (WHO) guidelines for community and night noise. The LOAELs for vibration and construction noise have been derived with consideration of the relevant British Standards relating to vibration effects on people and noise caused by construction. The values set for LOAELs and SOAELs for HS2 Phase 2a, therefore, have due regard to:

- established practice;
- research results;
- guidance in national and international standards;
- guidance from national and international agencies;
- independent review by academic, industry and Government employees; and
- review by HS2 Ltd's representatives on review groups.

4.92 In October 2018, the WHO published an update to its Community Noise Guidelines 1999, which are now called the Environmental Noise Guidelines (ENG18)¹⁴. This was published shortly before the assessment in the SES2 and AP2 ES was completed but does not require any changes to the Phase 2a methodology for sound, noise and vibration.

4.93 IP E12: Operational Noise and Vibration Monitoring Framework sets out the requirements for monitoring the performance of noise and vibration control measures applied to the operational phase of Phase 2a. It also sets out the requirement to share with local authorities the predicted and measured data on the operational noise

¹³ <https://www.hs2.org.uk/building-hs2/design-vision/>

¹⁴ <http://www.euro.who.int/en/publications/abstracts/environmental-noise-guidelines-for-the-european-region-2018>

and vibration performance of Phase 2a. These measures will help improve the existing performance of the railway and address any instances where performance is worse than expected conditions.

- 4.94 The Promoter has given assurances that the nominated undertaker will take all reasonable steps to design and construct altered roads, and to design, construct, operate and maintain the operational railway so that the combined airborne noise from these sources, predicted in all reasonably foreseeable circumstances, does not exceed LOAEL (defined above). Where it is not practical to achieve this objective, the nominated undertaker will reduce airborne noise from altered roads and the operational railway as far as is reasonably practicable.
- 4.95 The control of noise impacts from the HS2 Phase 2a route has been achieved firstly through sensitive design, avoiding noise-sensitive locations and keeping the alignment low within the landscape where reasonably practicable. Operational noise will be further reduced at source through the effective design and specification of the trains and track, as well as by noise barriers and landscape earthworks alongside the new railway.
- 4.96 These existing measures to mitigate operational noise have been enhanced by recommendations from the Select Committee. For example, an extension to a noise fence barrier near Upper Moreton Farm, which would remove the significant operational noise effect at Upper Moreton Farm (a Community Interest Company which provides care services), as set out in the Supplementary Environmental Statement 2.
- 4.97 The draft CoCP also includes measures to control and monitor noise and vibration during construction. One such measure is a requirement to apply 'best practicable means' to the control of noise and vibration during construction, through means such as employing quiet or low vibration equipment and screening equipment. Where noise and vibration exposure is predicted to, or does in fact, exceed certain levels, noise insulation or ultimately temporary rehousing will be undertaken by the nominated undertaker.
- 4.98 For further details see IPs E9: Control of Airborne Noise, E10: Control of Ground-Borne Noise and Vibration from the Operation of Temporary and Permanent Railways, E11: Control of Noise from the Operation of Stationary Systems, E12: Operational Noise and Vibration Monitoring Framework, E13: Control of Construction Noise and Vibration and D3: Code of Construction Practice.

Settlement

- 4.99 Excavation for tunnels and other below ground structures could potentially lead to small ground movements at the surface and below ground. The amount of ground movement will depend on a number of factors including depth and volume of works below ground, soil and groundwater conditions and the presence and nature of building foundations. HS2 Phase 2a has approximately 2.4km of tunnel and the promoter has agreed to use good tunnelling practice, including continuous working, erecting tunnel linings immediately after excavation and exercising tight control and monitoring at the face to minimise risks of settlement.
- 4.100 Where this is considered insufficient to mitigate the potential risk of damage to buildings, additional mitigation measures will be considered. These may include direct works on buildings, although in most cases will be limited to ground treatment around and beneath the buildings concerned. In addition, ground movement over the

area affected by settlement will be monitored to ensure that it is within predictions (and to alert the project of the need to take additional precautions if necessary). These mitigation measures are sufficient to avoid any significant adverse impacts arising in practice. The approach taken to assessing risk of damage from settlement is based on considerable previous experience (e.g. from Crossrail, Channel Tunnel Rail Link/HS1 and the Jubilee Line extension) and on robust, conservative, assumptions.

- 4.101 The nominated undertaker will also make provision to reimburse property owners for the reasonable costs they incur in remedying any material physical damage arising from ground settlement caused by the construction of HS2 Phase 2a, subject to certain conditions. A settlement deed has been developed, which the owner of a building meeting various qualification criteria can request that the nominated undertaker enters into. This is a formal legal undertaking concerning settlement, setting out specific requirements in relation to matters such as assessment of the risk of settlement, monitoring, protective works (where relevant) and compensation for any damage caused. It is not necessary to enter into the deed in order to benefit from the settlement policy.
- 4.102 See IP C14: Ground Settlement for further information.

Traffic and transport

- 4.103 HS2 Phase 2a has the potential to relieve some of the pressure on a particularly constrained section of the West Coast Main Line (WCML), and to deliver significant additional capacity, reliability and performance improvements in addition to the benefits from faster journey times.
- 4.104 The HS2 Phase 2a Bill and draft CoCP provide a number of mechanisms through which qualifying planning authorities and local highway authorities will be involved in, and given oversight of, potential traffic and transport impacts in their area. They are consulted in the preparation of Traffic Management Plans and construction workforce travel plans.
- 4.105 The HS2 Phase 2a Bill includes powers for the control of construction traffic, requiring qualifying authorities to approve the local roads to be used by large goods vehicles where the number of large goods vehicles exceeds 24 trips per day, to or from a site. IP8: Vehicle Flow Management and Safety Requirements During Construction, sets out how permitted lorry routes to and from work sites and the volume of vehicles on specified routes will be monitored. It also explains the vehicle and driver safety requirements which will be adopted to protect vulnerable road users.
- 4.106 Moreover, where HS2 works give rise to the permanent closure or realignment of highways, the scheme has sought to provide replacement routes and alignments, where reasonably practicable, that adopt the shortest route consistent with design and safety requirements. The relevant highway authority is required to approve details of new or realigned carriageways and can refuse approval on grounds such as safety.
- 4.107 In addition, there is an over-arching statutory duty on the nominated undertaker in relation to impacts on traffic. Under Part 1 of Schedule 32 to the HS2 Phase 2a Bill it must, in exercising the powers of the HS2 Phase 2a Bill, have regard to the potential disruption of traffic which may be caused, and to seek to minimise such disruption so far as reasonably practicable.

4.108 Through recommendations made by the HS2 Phase 2a Commons Select Committee, further local mitigation measures have been introduced to the scheme to reduce or remove traffic and transport impacts. For example:

- To restrict HGV traffic construction traffic from entering the village of Kings Bromley.
- To maximise the use of the Stone railhead and rail connection to the Infrastructure Maintenance base at Stone to reduce the use of local roads to and from construction sites.
- Numerous junction improvements within Staffordshire that will be affected by HS2 construction traffic.
- An upgrade to the haul route in order to reduce HS2 HGV construction traffic along Den Lane/Wrinehill Road and Checkley Lane.
- Where sensitive receptors have been identified such as roads with schools on, assurances have been given to certain relevant parties that these will not be designated as HS2 construction traffic routes.

4.109 During the Lords Select Committee, further commitments were made in order to ensure the appropriate mitigation would be implemented to reduce or remove traffic and transport impacts. For example:

- undertaking further traffic surveys on Yarnfield Lane to better understand current levels of use by cyclists and traffic speeds to inform the detailed design and
- provision of funding for a School Crossing Patrol Officer on the crossing near to Woore Primary School, subject to approval by Shropshire Council.

4.110 Phase 2a requires high quality aggregate to construct railway embankments. The use of borrow pits during construction will enable high quality aggregate to be extracted and processed locally and transported largely on site haul routes within the construction area of the scheme. Borrow pits will reduce HGV movements when compared to importing the material from commercial quarries, reducing impacts on the road network and local communities. Following their use, the borrow pits created during excavation can then be backfilled with surplus excavated materials generated from the construction of the Phase 2a scheme. This presents a more sustainable option, reducing the need to move this material off-site, further helping to limit impacts on the local road network and communities.

4.111 In recognition of the views expressed by the Select Committee, the Government has also agreed to establish a £6.5m Phase 2a Road Safety Fund to help improve traffic, pedestrian, cycle and equestrian safety along the route, and to ensure that the Proposed Scheme delivers a lasting safety legacy.

4.112 For further information see IPs E3: Management of Traffic During Construction, E4: Highways and Traffic During Construction — Legislative Provisions, E5: Roads and Public Rights of Way and E8: Vehicle Flow Management and Safety Requirements During Construction.

Waste and material resources

4.113 HS2 Ltd will apply the waste hierarchy to decisions concerning the management of waste. The waste hierarchy as described in the Resources and Waste Strategy for

England 2018¹⁵ sets out the preferred approach to the management of waste from waste prevention, to reuse, recycling, energy recovery and landfill as the last resort.

- 4.114 The construction of the Phase 2a scheme will lead to the generation of approximately 45 million tonnes of excavated material, around 92% of which will be reused within the project for the construction of engineering and environmental mitigation earthworks. A further 4% of this excavated material will be directed to areas along the line of the route. For excavated material which cannot be beneficially reused for these purposes, the nominated undertaker will seek timely opportunities for such material to be used in other local construction projects or the restoration of mineral sites. This is provided that the transportation of that material does not result in significant environmental effects.
- 4.115 Through engagement with directly affected stakeholders, waste management in particular locations has already been improved to reduce the impact of scheme on local people. For instance, areas of proposed local placement of surplus excavated material at locations such as Gonsley Farm and North Pire Hill Farm have been reconfigured to reduce the impact on the Farm holdings.
- 4.116 For further information see IPs E17: Excavated Material and Waste Management, and D12: Borrow Pits.

Water resources and flood risk

- 4.117 HS2 Ltd has designed HS2 Phase 2a to avoid, reduce and mitigate potential impacts from the scheme on water resources, including groundwater.
- 4.118 The HS2 Phase 2a Bill contains important protective provisions that provide the Environment Agency and Lead Local Flood Authorities with approval powers for HS2 Phase 2a works affecting land drainage, flood defence and water resources and contain protection for fisheries. Detailed agreements have also been reached with utility providers such as Severn Trent Water, which supplement the protections for their assets in the HS2 Phase 2a Bill.
- 4.119 The ES for HS2 Phase 2a provides an assessment of the route-wide impacts and likely significant effects related to surface water and groundwater resources and flood risk. It sets out how HS2 Phase 2a complies with the requirements of the Water Framework Directive and alignment with the Sequential test and Exception test policies in the National Planning Policy Framework¹⁶.
- 4.120 Structures along the route have been designed to ensure the quality of watercourses are not adversely affected. The detailed design process will be used to further reduce or remove any residual impacts. The draft CoCP contains measures for the protection of ground and surface water during the construction phase of the project.
- 4.121 The design of HS2 Phase 2a will seek to ensure that controlled waters; rivers, streams, canals, lakes, ponds, ditches and groundwater are protected from pollution and that appropriate water quality standards are met. Sustainable drainage systems will be used to control the rate, volume and quality of runoff from the rail corridor and other infrastructure, taking projected climate change impacts into account. These systems will encourage storm water to soak into the ground or, where that is not reasonably practicable, discharge it into the wider water environment at a rate that

¹⁵ Defra (2018), Our Waste, Our Resources: A Strategy for England 2018. London. HMSO.

¹⁶ Department for Communities and Local Government (2018). National Planning Policy Framework. London, Her Majesty's Stationery Office.

matches existing runoff rates. The detailed design of watercourse diversions, watercourse realignments and of culverts will be developed in general accordance with CIRIA¹⁷, and the agreement of the Environment Agency and Lead Local Flood Authorities.

- 4.122 HS2 Phase 2a measures to control water run-off include features such as balancing ponds and replacement flood storage areas. Where the railway and associated works have the potential to increase flood risk, the design reflects the approach required by the National Planning Policy Framework (NPPF) and the supporting Technical Guidance (such as the incorporation of flood risk mitigation measures). The aim is for no increase in the risk of flooding for vulnerable receptors including residential property (defined as more/highly vulnerable and essential infrastructure in Table 2 in the Technical Guidance to the NPPF) during the lifetime of HS2 Phase 2a, taking projected climate change impacts into account.
- 4.123 Where piling is required as a result of the construction of HS2 Phase 2a, a number of techniques will be used to form deep foundations. The choice of pile type and installation method will be based upon a piling risk assessment and will generally be dictated by factors such as design loads, ground conditions, proximity of sensitive receptors and speed of installation. Precautions will be taken to prevent soil contamination migrating downwards into aquifers where piling takes place, in accordance with national guidance.
- 4.124 For further information see IPs E15: Water Resources, Flood Risk and Authorisation of Related Works, E21: Balancing Ponds and Replacement Flood Storage Areas and E26: Climate Change Adaptation and Resilience.

¹⁷ CIRIA is the construction industry research and information association.

5. Summary and Conclusion

- 5.1 HS2 Phase 2a would deliver significant economic benefits, as well as benefits to transport users, by providing sufficient north-south rail capacity to meet long term demand and the country's long-term economic needs. It would also improve connectivity by delivering better journey times and improve resilience and reliability of the network. In delivering these benefits, HS2 Phase 2a is affordable and represents good value to the taxpayer. Operating this section of the HS2 railway by 2027 would deliver benefits to northern cities sooner than previously envisaged for Phase Two.
- 5.2 It is, however, not possible to construct a project of this magnitude without some impact on the environment. We have worked hard to reduce such impacts as far as reasonably practicable and, as outlined in this paper and in greater detail in the ES, the Government has put in place significant control and mitigation strategies to address significant environmental effects. Beyond this the project has also committed to continue to look for ways to further reduce these effects. Changes implemented as part of the Select Committee process have already started this process and it will be continued through the detailed design process. The Government remains convinced that, taking into account its environmental effects and the comments received on these during the Parliamentary process, HS2 Phase 2a remains worthy of its continuing support.
- 5.3 A summary of the reasons for Government's proposal to endorse the HS2 Phase 2a project has been provided at Annex A. The Government urges the House to endorse its view and to give their approval for this important strategic project.

Annex A: Summary of Reasons for Government's proposal to endorse HS2 Phase 2a

A.1 The following is a summary of the main factors taken into account, the main mitigation measures and the main benefits of HS2 Phase 2a on which the Government has formed the view that HS2 Phase 2a remains in the public interest notwithstanding the unavoidable environmental impacts of such a project. The Government is content that it has fully met the requirements of the EIA Directive.

Main documents considered:

- The Environmental Statement (ES) (as amended and supplemented)
- The responses to the consultations on the main ES and each AP ES and SES
- The Strategic Case for HS2 published in October 2013, the Phase 2a Strategic Case published in November 2015 and the Strategic Case for HS2 Phase 2 published in July 2017
- Main alternatives considered in the ES

Main factors taken into account:

- Agriculture, forestry and soils
- Air quality
- Climate change
- Community and socio-economics
- Cultural heritage
- Ecology and biodiversity
- Health
- Landscape and visual amenity
- Sound, noise, vibration
- Settlement
- Traffic and transport
- Waste and material resources
- Water resources and flood risk

Main mitigation measures:

- HS2 Phase 2a Bill provisions, including:

- Making planning permission subject to manageable detailed approvals
- Requirements for certain approvals from bodies with relevant statutory duties
- Enforceable undertakings and assurances
- Environmental Minimum Requirements made in consultation with local authorities and other key stakeholders containing strategies to control/mitigate adverse effects (and enforceable by a Government undertaking to Parliament), including:
 - The draft General Principles
 - The draft Code of Construction Practice
 - The draft Planning Memorandum
 - The draft Environmental Memorandum
 - The draft Heritage Memorandum
- Project changes which address specific concerns:
 - Lowering of the Kings Bromley and River Trent viaducts
 - Relocating the southern portal of the Whitmore Heath tunnel further south
 - A replacement facility for Mayfield Children's Home
 - Additional noise mitigation (e.g. noise bund at Woodhouse Farm)
 - Additional land for the reconfiguration of Ingestre Park Golf Club
 - The proposed new Parkgate grid connection

Main benefits:

- Generating GDP benefits
- Improving connectivity by delivering better journey times and making travel easier
- Providing sufficient capacity to meet long term demand
- Improving resilience and reliability across the rail network
- Creating and supporting regeneration opportunities via improving connectivity
- Improving transport opportunities for all passengers
- Supporting the efficient movement of people and freight, which is essential for economic growth

Annex B: List of HS2 Information Papers and Other Sources of Information

This annex lists various sources of information that the Promoter considers may be relevant to the consideration of the environmental effects of HS2 Phase 2a, including websites from which further information can be obtained.

B1. Environmental Statement

Note that non-technical summaries (NTSs) were produced for each of the documents below, on the same date as the actual ES, AP ES or SES.

Document	Deposit Date
Environmental Statement and accompanying NTS	17 July 2017
Supplementary Environmental Statement, Additional Provision Environmental Statement and accompanying NTS	23 March 2018
Supplementary Environmental Statement and Additional Provision 2 Environmental Statement and accompanying NTS	8 February 2019

Electronic copies of the Environmental Statement documents are available from the internet at: <https://www.gov.uk/government/collections/hs2-phase-2a-environmental-statement>

B2. ES Consultation Independent Assessor Reports

Document and weblink	Date Published
Report of the Independent Assessor - Summary of Issues raised by Comments on the Environmental Statement. Available in the House Library.	20 November 2017
Additional Provision (AP1): Report of the Independent Assessor - Summary of Issues raised by Comments on the Supplementary Environmental Information https://old.parliament.uk/documents/commons-committees/hs2-phase-2a/HC-1316-2017-19.pdf	21 June 2018
Additional Provision (AP2): Report of the Independent Assessor - Summary of Issues raised by Comments on the Supplementary Environmental Information. Available in the House Library.	22 May 2019

B3. HS2 Information Papers

The following HS2 Information Papers ('IPs') have been produced explaining some of the more frequently raised issues in relation to the HS2 Phase 2a project.

Series	Information Paper Title
Route Development	
A1	Development of the HS2 Proposed Scheme
A2	Strategic Case for Phase 2a
Understanding the hybrid Bill	
B1	Understanding the Bill
B2	The Main Provisions of the Planning Regime
B3	Limits on Parliamentary Plans
B4	Disapplication of Legislation
B5	Compliance with Undertakings and Assurances
B6	Environmental Impact Assessment and Human Rights
B7	Railway Powers in the Hybrid Bill
B8	Time Limits in the Bill
B9	Introduction to Hybrid Bill Powers
B10	Hybrid Bill Process
B11	Additional Provisions
Property, Compensation and Funding	
C1	Information for Property Owners
C2	Rural Landowners and Occupiers Guide
C3	Land Acquisition Policy
C4	Safeguarding and Statutory Blight
C5	Generalised Blight
C6	Disposal of Surplus Land
C7	Business Relocation
C8	Compensation Code for Compulsory Purchase
C9	Recover of Costs by Property Owners
C10	Small Claims Scheme
C11	The Community and Environment Fund and Business and Local Economy Fund
C12	Local Authority Funding and New Burdens
C13	Site Access for Surveys
C14	Ground Settlement
C15	Compensation for Residential Tenants
Construction	
D1	Design
D2	Construction Compounds

D3	Code of Construction Practice
D4	Construction Commissioner
D5	Working Hours
D6	Inclusive Design Policy
D7	HS2 Phase 2a Construction Timetable
D8	Maintenance of Public Utilities
D9	Worksite Security
D10	Maintaining Access to Residential and Commercial Property
D11	Track Possessions for Phase 2a Engineering Work
D12	Borrow Pits
Environment	
E1	Control of Environmental Impacts
E2	Ecology
E3	Management of Traffic During Construction
E4	Highways and Traffic During Construction- Legislative Provisions
E5	Roads and Public Rights of Way
E6	Private Means of Access
E7	Future Highway Maintenance Responsibilities
E8	Vehicle Flow Management and Safety Requirements During Construction
E9	Control of Airborne Noise
E10	Control of Ground-Borne Noise and Vibration from the Operation of Temporary and Permanent Railways
E11	Control of Noise from the Operation of Stationary Systems
E12	Operational Noise and Vibration Monitoring Framework
E13	Control of Construction Noise and Vibration
E14	Air Quality
E15	Water Resources, Flood Risk and Authorisation of Related Works
E16	Land Drainage
E17	Excavated Material and Waste Management
E18	Land Quality (Contamination)
E19	Soil Handling for Land Restoration
E20	Maintenance of Landscaped Areas
E21	Balancing Ponds and Replacement Flood Storage Areas
E22	Mitigation of Significant Community Effects on Public Open Space and Community Facilities
E23	Approach to Sustainability
E24	Archaeology
E25	Burial Grounds
E26	Climate Change Adaptation and Resilience

E27	Carbon
E28	Green Infrastructure and the Green Corridor
Operations	
F1	Crewe
F2	Phase 2a Tunnels
F3	Infrastructure Maintenance and Rail Systems Construction Facilities
	HS2 Railhead and Maintenance Base Update
	HS2 Phase 2a Strategic Evaluation of Railhead and IMB-R Locations
F4	Future Operation and Commercial Issues
F5	Future Train Service Patterns on the West Coast Main Line Corridor
F6	Rail Freight Operations
Engagement	
G1	Consultation and Engagement
G2	Community Engagement
HS2 Policy	
H1	Equality, Diversity and Inclusion Policy
H2	Skills and Employment
H3	Education Programme
H4	National College for High Speed Rail

Electronic copies of these documents are available from the internet as follows:

Route Development:

<https://www.gov.uk/government/publications/route-development-hs2-phase-2a-information-papers>

Understanding the hybrid Bill:

<https://www.gov.uk/government/publications/understanding-the-hybrid-bill-hs2-phase-2a-information-papers>

Property, Compensation and Funding:

<https://www.gov.uk/government/publications/property-compensation-and-funding-hs2-phase-2a-information-papers>

Construction:

<https://www.gov.uk/government/publications/construction-hs2-phase-2a-information-papers>

Environment:

<https://www.gov.uk/government/publications/environment-hs2-phase-2a-information-papers>

Operations:

<https://www.gov.uk/government/publications/operations-hs2-phase-2a-information-papers>

Engagement:

<https://www.gov.uk/government/publications/consultation-and-engagement-hs2-phase-2a-information-papers>

HS2 Policy:

<https://www.gov.uk/government/publications/policy-hs2-phase-2a-information-papers>

B4. HS2 Phase 2a Environmental Minimum Requirements

The Environmental Minimum Requirements set out the high level environmental and sustainability commitments that the government will enter into through the hybrid Bill process.

As set out in the draft general principles there are 4 documents (titled “annexes”) which are referred to in the environmental minimum requirements:

- Annex 1: Draft code of construction practice
- Annex 2: Draft planning memorandum
- Annex 3: Draft heritage memorandum
- Annex 4: Draft environmental memorandum

Electronic copies of these documents are available from the internet at:

<https://www.gov.uk/government/publications/environmental-minimum-requirements-for-hs2-phase-2a>

B5. Other Documents that may be of particular interest

Strategic Case for HS2 (29 October 2013)

This document sets out strategic reasons for building HS2, the new north to south high speed rail line between London, Birmingham, Leeds and Manchester.

<https://www.gov.uk/government/collections/the-strategic-case-for-hs2>

HS2 Phase 2a Strategic Outline Business Case – Strategic Case (November 2015)

This document sets out the Strategic Case for Phase 2a, and for accelerating delivery of this section of HS2 Phase Two

<https://www.gov.uk/government/publications/hs2-supplement-to-the-october-2013-strategic-case>

HS2 Phase 2 Strategic Case

This document sets out the Strategic Case for HS2 Phase Two, including the accelerated delivery of HS2 Phase 2a:

<https://www.gov.uk/government/publications/hs2-phase-two-strategic-case>

Oakervee Review of HS2

This document sets out the findings of Douglas Oakervee's independent review of HS2, published in August 2019:

<https://www.gov.uk/government/publications/oakervee-review-of-hs2>

Draft HS2 Phase 2a Register of Undertakings and Assurances

A draft register of all undertakings and assurances given thus far in the process. The latest version of the register is available from the internet at:

<https://www.gov.uk/government/publications/hs2-phase-2a-register-of-undertakings-and-assurances>

B6. Websites

The following is the link to the House of Lords Select Committee web page:

<https://committees.parliament.uk/committee/404/high-speed-rail-west-midlands-crewe-bill-select-committee-lords/>

The following is the link to the House of Commons Select Committee web page:

<https://old.parliament.uk/business/committees/committees-a-z/commons-select/high-speed-rail-west-midlands-crewe-bill-select-committee-commons/>

This is a link to the HS2 section of the GOV.UK website which covers the whole HS2 scheme:

<https://www.gov.uk/transport/hs2>

This is a link to the HS2 Phase 2a Bill section (i.e. the part covered by this paper):

<https://www.gov.uk/government/collections/high-speed-rail-west-midlands-to-crewe-bill>

CCS1120559130

ISBN 978-1-5286-2261-5