



Department
for Transport

Government Overview of Case for Phase One of HS2 and its Environmental Impacts - Update for the House of Lords

Moving Britain Ahead



Government Overview of Case for Phase One of HS2 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

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1. Introduction

- 1.1 High Speed Two (HS2) is the Government's proposal for a new, high speed north-south railway. On 25 November 2013, the Government deposited a hybrid Bill with Parliament to secure the powers to construct and operate Phase One of HS2 running between London, Birmingham and the West Midlands. The Bill is entitled the 'High Speed Rail (London - West Midlands) Bill' ("HS2 Phase One Bill").
- 1.2 The HS2 Phase One Bill would provide the powers for a new high speed, high capacity line from Euston to the north of Birmingham, where it will re-join the existing West Coast Main Line allowing fast services direct to destinations on the existing line including Manchester, Liverpool, Crewe, Preston and Glasgow. New high speed trains will also serve Birmingham city centre and an interchange designed to serve the wider West Midlands. At Old Oak Common in west London, a new interchange will be built connecting HS2 with Crossrail, the Great Western Main Line and the Heathrow Express.
- 1.3 At Third Reading of the HS2 Phase One Bill, the House of Lords will be asked to approve the Bill. To assist the House of Lords in providing this approval, Standing Order 83A(9) requires the Government to provide a statement that sets out the main reasons and considerations upon which Parliament is invited to give consent to the project to be authorised by the Bill. This statement must also set out the main measures to avoid, reduce and, if possible, offset the major adverse effects of the project.
- 1.4 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 One, and explains why the Government continues to take the view that the HS2 Phase One project is deserving of its support. The Government will also arrange for time to be allocated at Third Reading to facilitate debate of environmental issues.
- 1.5 Under the Environmental Impact Assessment (EIA) Directive (92/2011/EU) ("the EIA Directive"), decision making bodies are required to consider the environmental effects of projects when deciding whether or not 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, with a view to informing the decision maker as part of the development consent process.
- 1.6 In the case of the HS2 Phase One 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 for the purpose of enabling 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.

- 1.7 When the HS2 Phase One 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 was undertaken for the HS2 Phase One project on behalf of the Secretary of State. The aim of the assessment was to:
 - Identify the potential environmental impacts associated with the construction and operation of HS2 Phase One;
 - Identify measures to mitigate adverse significant impacts; and
 - Predict the magnitude and significance of any impacts which will remain.
- 1.8 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 Bill was introduced in November 2013.
- 1.9 The main ES is comprised of the following documents:
 - NTS: which provides a summary in non-technical language of HS2 Phase One, its likely significant environmental effects, both beneficial and adverse, and the means to avoid or reduce the adverse effects;
 - Volume 1: Introduction to the ES and the Proposed Scheme. This describes HS2, and the environmental impact assessment process, the approach to consultation and engagement, details of the permanent features and generic construction techniques as well as a summary of main strategic and route-wide alternatives and local alternatives considered;
 - Volume 2: Community Forum Area (CFA) reports and map books. There are 26 CFA reports and associated map books which present the likely significant environmental effects of HS2 Phase One;
 - Volume 3: Route-wide effects. This describes the effects of HS2 Phase One on a route-wide basis;
 - Volume 4: Off-route effects. This describes the off-route effects HS2 Phase One beyond those within the CFA descriptions in Volume 2; and
 - Volume 5: Appendices and map books. This contains supporting environmental information and associated map books.
- 1.10 ES Volume 5 includes an 'Alternatives Report' that describes the evolution of the High Speed Two (HS2) policy and proposals. It summarises the objectives and requirements of the Government's proposals for new high speed lines, the options considered and choices made. It considers a range of different alternatives from strategic alternatives for a high speed rail network to alternative route alignments considered between London and the West Midlands. In each case it explains why the decisions were made, taking account of environmental considerations. In addition, the ES Volume 2: CFA Reports include details of the main local alternatives considered.

- 1.11 Since the deposit of the HS2 Phase One Bill, the Government has submitted a number of further environmental statements produced following changes to the project requiring Additional Provisions¹ ('the APESs') or changes which, although not themselves requiring changes to the Bill powers, altered the significant environmental impacts and thus led to the publication of a supplementary environmental statement ('the SESs'). A list of these APESs and SESs is provided in Appendix B. The format of these APESs and SESs follows that of the main ES (see paragraph 1.8). Unless the context otherwise requires, the term 'Environmental Statement' and 'ES' in this paper refers to the entire suite of documents listed in the table in Appendix B, which together comprise the HS2 Phase One ES.
- 1.12 The parliamentary procedures for the submission of hybrid Bills are contained in the Standing Orders of each House of Parliament relating to private business. Following the deposit of the main ES and each APES and SES, compliance with Standing Orders was assessed by the Examiners of Petitions for Private Bills and reported to the Commons and Lords Standing Order Committees, who in turn determined compliance or required conditions to ensure compliance with the applicable Standing Orders.
- 1.13 In addition, following the deposit of the main ES and each APES and SES, a public consultation was carried out by Parliament. An Independent Assessor was appointed in December 2013 to produce reports summarising the issues raised in the responses to these consultations². A list of these reports is contained in Appendix B. Copies have been placed in the House Libraries
- 1.14 A number of parties have challenged the adequacy of the ES. The ES accompanying the HS2 Phase One Bill complies with all UK and EU legal requirements and 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 Bill has secured its Second Reading in both the Commons and the Lords.
- 1.15 This Statement of Reasons is not intended to take the place of the NTS summary of the HS2 Phase One ES or, indeed, the ES itself. The Government therefore advises Lords Members to consult the main ES, the five APES and the four SES 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 Appendix B. Each was accompanied by an NTS deposited on the same date.
- 1.16 In addition to considering the ES, Members of the House of Lords should also consider the views expressed in:
- responses to the consultations on the main ES, SESs and APESs, which are summarised in the Independent Assessor reports referred to in paragraph 1.12 above. A list of these reports is contained in Appendix B;
 - the First Special Report of the Commons High Speed Rail Bill Committee, Session 2014-15, on the HS2 Phase One Bill, HC 338, published on 26 March 2014, along with the Government's Response, published on 9 June 2014;

¹ An Additional Provision is an amendment to extend powers which affect private interests, contained in the Bill.

² 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.

- the First Special Report of the Commons High Speed Rail Bill Committee, Session 2015-16, on the HS2 Phase One Bill, HC 698, published on 17 December 2015, along with the Government's Response, published on 2 February 2016;
- the Commons High Speed Rail Bill Select Committee: Final Report of the High Speed Rail Bill Committee, Session 2015-16, on the HS2 Phase One Bill, HC 129, published on 22 February 2016, along with the Government's Response, published on 10 March 2016; and
- The Lords High Speed Rail (London - West Midlands) Bill Select Committee Special Report of Session 2016-17 HL Paper 83, published 15 December 2016, along with the Government's Response, published on 17 January 2017.

1.17 Members may also wish to examine the various Information Papers ('IPs') that have been produced to address some of the more frequently raised issues in relation to the HS2 Phase One project, including its environmental impacts. A list of these IPs is contained in Annex B along with other documents and sources of information that we consider may be relevant.

2. Role of the Select Committee

- 2.1 Before introducing the HS2 Phase One Bill to Parliament, the Government had already looked for ways to limit the likely environmental impact of the HS2 Phase One 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 Government recognises that this is an ongoing process.
- 2.2 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.
- 2.3 The HS2 Phase One Bill is a hybrid Bill and, as such, subject to a petitioning process. In total, 3,408 petitions were lodged against the Bill and its Additional Provisions (2,586 in the Commons and 822 in the Lords) and Select Committees were established in each House to consider those petitions.
- 2.4 The Government was able to satisfy a significant number of petitioners without the need for a hearing before the Committees. In some cases in the Commons 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 five Additional Provisions to the Bill deposited during the Commons Select Committee stage. 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.
- 2.5 Of the 822 petitions submitted to the House of Lords Select Committee, the locus of 278 petitions was successfully challenged. Of the remaining 544 petitions the Select Committee heard 314 petitions in formal session, with the remainder withdrawing, or choosing not to appear before the Select Committee, mainly as a result of successful prior negotiation with HS2 Ltd.
- 2.6 In many cases petitioners asked for commitments about the way in which the project would be taken forward (see also paragraph 3.13 below) or were reassured by policies already put in place to meet their concerns.
- 2.7 It should be noted that not all the concerns raised during the petitioning processes were environmental in nature, but the majority of petitions did include at least some environmental concerns (e.g. the general impact of construction, and specific matters such as construction traffic, noise, dust and settlement were frequently mentioned).

- 2.8 In addition to considering the petitions of those directly and specially affected by the scheme, as noted above, the Commons Select Committee was also responsible for scrutinising and approving a significant number of changes made to the project, as prescribed in the five Additional Provisions. Many of the changes brought forward were aimed, in whole or part, at reducing environmental impacts. Examples include:
- A revised Euston Station design and construction programme that will minimise disruption to the operation of the conventional station. As part of the revised proposals, the high speed station will be constructed in two stages, initially providing six high speed platforms to allow HS2 Phase One to be operational in 2026. The revised design will include a subsurface high speed station, with a ground-level concourse;
 - A revised vertical alignment in the Lichfield area which would reduce the environmental impacts in this area. The revised alignment lowers the HS2 route by up to 22.3m, so that it will run in cutting to the east of Lichfield and pass beneath the West Coast Main Line, the South Staffordshire Line and the A38, instead of on embankments and viaducts to cross this existing transport infrastructure;
 - A 2.6km extension of the Chiltern tunnel from Mantle's Wood to South Heath. The tunnel extension would reduce the environmental impacts in the area, avoiding the loss of approximately 9ha of ancient woodland from Mantle's Wood, Farthings Wood and Sibley's Coppice;
 - The lowering of the alignment at Drayton Bassett and Hints, which would avoid a road closure, provide increased screening to the railway and reduce the amount of ancient woodland lost at Rookery Wood;
 - The provision of additional noise mitigation at Wendover and Chetwode including an extension of the Wendover green tunnel southward by 100m, and increasing the height and length of noise fence barriers at this location;
 - A revised construction traffic and sustainable placement strategy in Hillingdon, including the provision of a haul road between the Harvil Road main construction compound and the A40 Swakeleys roundabout. The revised proposals would reduce the amount of HS2 construction traffic using the local road network at this location;
 - The provision of higher noise barriers in three locations along the Colne Valley viaduct, which will removing the likely significant community operational noise effects on a number of residential properties;
 - A revised vertical alignment of the HS2 route as it passes through Burton Green, extensions to the 'green' tunnel and the realignment of Kenilworth Greenway beneath Cromwell Lane and additional landscape mitigation earthworks. These changes reduce construction and operational noise impacts for a number of properties, avoiding amenity as well as isolation effects on residents and users of the Kenilworth Greenway;
 - A revised approach for Old Oak Common Lane, which will see the provision of step-free pedestrian access maintained throughout the construction period, apart from occasional short-term closures for certain construction works. This change

will reduce impacts on the residents of Wells House Road, by maintaining pedestrian access to community facilities located to the south along Old Oak Common Lane; and

- Revised sustainable placement strategies at Calvert and Hunts Green which would reduce local environmental impacts, as well as impacts on local businesses.

2.9 During the Lords Select Committee process, over 2,400 further assurances were issued, providing binding commitments on the Secretary of State, bringing the total number of individual assurances offered over the course of the two Select Committee stages to well over 4,500. Some of the additional assurances offered over the course of the Lords Select Committee hearings included:

- Providing the London Borough of Camden with a fund of £3.5 million to support community measures that will provide additional mitigation for the area. This funding will be in addition to further funding for the provision of an Environmental Health Officer, to provide advice to local residents on applications for individual household mitigation measures, and to new funding for support workers to assist vulnerable people affected by the HS2 works; and
- Buckinghamshire County Council, whose area will be affected by numerous construction traffic related issues, were provided with assurances which included additional traffic calming measures on the A41, a contribution of £500,000 for the provision of a new car park for the Great Missenden Church of England Combined School and £500,000 towards the improvement and repair of the existing cycleways to the north and south of Wendover.

3. General approach to the control and mitigation of environmental impacts

- 3.1 Whilst HS2 Phase One 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 which passes through rural and urban areas without some adverse impacts on the environment on or near the intended route. When considering the route of HS2 Phase One it was therefore necessary to balance a number of different considerations, attempting to maximise the benefits whilst minimising the adverse impacts and having due regard to other relevant factors such as implications for safety and affordability.
- 3.2 The implementation of HS2 Phase One 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, and the creation of new stations and associated infrastructure (e.g. ventilation shafts). The choice of route for HS2 and its design has been informed by numerous consultations with local communities, relevant authorities and a detailed assessment of its environmental effects.
- 3.3 In designing the route and strategies for controlling the impacts of constructing and operating the railway, HS2 Ltd have sought to reduce or mitigate, as far as is reasonable practicable, the environmental impacts of the scheme, particularly those that might affect people and communities, historic buildings, conservation areas, sensitive habitats and areas of natural beauty. The route itself will be in tunnel for approximately 31 miles, in cutting or retained cutting below the natural ground level for a further 53 miles. For the remainder of the route, 50 miles will be at ground level, or on embankment or viaduct and 1.5 miles passing through stations. Around 75% of the route at or above ground level will feature measures such as noise barriers and landscaped earthworks alongside the line that will further screen and protect local people and assist the railway to blend into the existing landscape. Some 7 million trees and shrubs will be planted along the line of the route.
- 3.4 The approach to mitigation adopted for HS2 Phase One 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; and then, if necessary, to offsetting them through repair (restoration or reinstatement) or compensation. In some cases, such measures may have longer term benefits to the environment, for example the use of mitigation planting to join up remnants of ancient woodland that once formed the Bernwood Forest in Buckinghamshire.

- 3.5 This section looks at the extent to which the Government expects to be able to avoid, prevent, reduce, offset, repair or compensate for significant adverse environmental impacts.
- 3.6 There will be a number of mechanisms in place to control the environmental impacts of HS2 Phase One. Some of these are contained within the HS2 Phase One Bill itself. For example, whilst the Bill effectively grants planning permission for the HS2 Phase One project, this is subject to various requirements to obtain approvals of detailed matters. In particular, Schedule 17 of the Bill sets out the detailed approvals required from qualifying local planning authorities³ (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). 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 5 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.
- 3.7 The Government has also developed various control and mitigation strategies which fall outside of the Bill, most notably the Environmental Minimum Requirements (EMRs). The EMRs will consist of a Code of Construction Practice, 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 Bill.
- 3.8 The Environmental Memorandum covers how the nominated undertaker⁴ will address environmental issues such as ecology and nature conservation, landscape and water resources and looks at the wider strategy for addressing those issues rather than merely the construction process itself (as the latter is covered by the Code of Construction Practice). The Environmental Memorandum includes the key requirement that the nominated undertaker must use reasonable endeavours to adopt mitigation measures that will further reduce any adverse environmental effects caused by HS2 Phase One compared to those reported in the ES, insofar as these mitigation measures do not add unreasonable cost or unreasonable delay to the project.
- 3.9 The Planning Memorandum is primarily aimed at setting out an understanding between the Government and local authorities relating to the treatment of applications for detailed planning approvals under the HS2 Phase One Bill. The Heritage Memorandum provides the strategy to ensure that the design and construction of HS2 Phase One are carried out with due regard for heritage considerations. The Code of Construction Practice 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.
- 3.10 The EMR documents were published in draft when the Bill was deposited. They are being developed and refined in consultation with local authorities and other key

³ The HS2 Phase One Bill gives local planning authorities a choice between having a wide or narrow range of controls over details. Local planning authorities opting for a wide range of controls are referred to as qualifying authorities. These are local authorities which have signed the Planning Memorandum before the Bill was reported from the Select Committee in the House of Lords.

⁴ 'nominated undertaker' refers to the person or persons appointed by the Secretary of State to deliver the HS2 Phase One scheme under the powers granted by the Bill.

stakeholders and will be finalised by the time of Royal Assent. A list of the EMR documents is included in Appendix B.

3.11 The controls contained in the EMRs are a key element of the Government's overall strategy for ensuring that impacts which have been assessed in the HS2 Phase One 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 have significant environmental impacts (meaning significant adverse impacts where the change is a modification to the current project); or
- Would be subject to a separate consent process (and therefore further EIA if required).

3.12 The Government has provided important undertakings to Parliament in relation to the enforcement of the EMRs. On the first day of the House of Commons Select Committee (1 July 2014) the Government gave an undertaking that the EMRs would be made contractually binding on the nominated undertaker. The Government also gave the following undertaking to Parliament concerning their enforcement:

“Insofar as the Environmental Minimum Requirements are not directly enforceable against any person appointed as the nominated undertaker, the Secretary of State will take such steps as he considers reasonable and necessary to secure compliance with those requirements.”

3.13 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:

- Birmingham City Council and Friends Life and AXA Real Estate Ltd, in relation to designing the Rolling Stock Maintenance Depot at Washwood Heath to minimise permanent and temporary land take and maximise employment and economic opportunities at the site;
- The Island Project School in respect of providing support to relocate the school to suitable alternative premises, having regard to the complex needs and special requirements of the pupils at the School;
- Hillingdon Outdoor Activity Centre in order for it to remain in operation on its current site until 2018;
- Solihull Metropolitan Borough Council (SMBC) and Packington Estates, in relation to implementing HS2 Phase One in such a way that has regard to SMBC's UK Central development proposal, insofar as they are within the limits and powers of the Bill and within the allocated budget;
- London Borough of Hillingdon (LBH), in respect of working with Transport for London and LBH to developing options, within the limits and powers of the Bill, aimed at reducing the number of HGV movements in the Ickenham area during the construction of HS2;
- London Borough of Camden (LBC), in relation to a range of matters including the deployment of the HS2 temporary rehousing policy in special circumstances; air

quality issues; the application of the construction noise and vibration mitigation package; and the provision of engagement with the relevant local authority, route wide, on Section 61 of the Control of Pollution Act 1974 matters;

- British Car Auctions (BCA) increasing the period of advance notice provided regarding the application of compulsory purchase powers from three months to six months, in order to support their efficient relocation; and
- The National Farmers Union (NFU), in relation to minimising, as far as reasonably practicable, the loss of certain grades of agricultural land; consulting farmers and landowners regarding the proposed use of agricultural land for HS2 ecological mitigation works and seeking to accommodate reasonable proposals aimed at facilitating the efficient management of the agricultural land concerned; and working with farmers whose productive agricultural soils are temporarily affected by the construction of the HS2 works, with the aim of bring those agricultural soils back to enable their former use.

- 3.14 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. With the businesses of Drummond Street on the western side of the HS2 Euston Station, the Government has committed to appointing a senior manager accountable for ensuring the Code of Construction Practice is implemented effectively on Drummond Street to minimise the impact of the construction phase on the operation of the businesses there.
- 3.15 As noted above, the Government has provided over 4,500 undertakings and assurances in relation to HS2 Phase One. A draft register of all undertakings and assurances given has been produced and published most recently on 5 September 2016⁵. The register will be finalised after Royal Assent and the nominated undertaker will be required to comply with the undertakings and assurances recorded on the register.
- 3.16 As noted in paragraph 3.12 the Secretary of State has given an undertaking to the Select Committees concerning the enforcement of the EMRs, which includes all undertakings or assurances recorded in the register of undertakings and assurances. This means that in the event of a failure to comply with an assurance, recourse will ultimately be through the Secretary of State, and the Secretary of State is answerable to Parliament for securing compliance.
- 3.17 Finally, in addition to the arrangements put in place specifically for HS2 Phase One, there are general legislative controls that will apply to HS2 Phase One 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.
- 3.18 More information on control and mitigation strategies as they apply to different types of potential impact is provided in the following section. It very briefly highlights the key mitigation measures that would be used and indicates whether significant impacts would arise despite mitigation. In addition, a range of Information Papers (IPs) have been produced by HS2 Ltd to address some of the more frequently raised

⁵ www.gov.uk/government/publications/high-speed-rail-london-west-midlands-bill-register-of-undertakings-and-assurances

issues in relation to the HS2 Phase One project, including its environmental impacts. A list of all the IPs can be found at Appendix B, but see in particular IP D3: Code of Construction Practice and IP E1: Control of Environmental Impacts’.

Agriculture and soils

- 3.19 Agriculture is the most common land use along the Phase One line of route. In developing the Phase One route HS2 Ltd has sought to minimise the adverse impacts on agricultural holdings as far as is reasonably practicable. HS2 Ltd employed specialists in agriculture to visit farms and discuss the effects of HS2 with individual farmers and land owners. The information gathered was taken into account in the design of the HS2 Phase One scheme, particularly in respect of the provision of accommodation bridges and underpasses to maintain access to land, and in respect of compensation for the loss of land and replacement of farm buildings.
- 3.20 To ensure that as much agricultural land is returned to productive use once the railway is in operation, the Government has committed to further assurances, in particular assurances have been given to the NFU and the Country Land and Business Association Limited (CLA), that the nominated undertaker will seek to minimise the loss of Grade 1, 2 and 3a agricultural land to the scheme through detailed design. Assurances have also been given 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.
- 3.21 For the construction phase, the Code of Construction Practice has been developed to minimise the effects of construction on agricultural holdings, farming operations and soil resources. The Code includes provisions to maintain farming operations during construction on affected holdings where practicable, and to restore land to an appropriate use and quality. A commitment has also been made to the NFU and CLA that, during construction, the nominated undertaker will ensure there is an agricultural liaison officer experienced in agricultural matters and contactable by telephone 24 hours a day, seven days a week.
- 3.22 Further information on this subject can be found in Information Paper C2: Rural Landowners and Occupiers Guide and the Guide for Farmers and Growers published in May 2016. The Guide for Farmers and Growers sets out HS2 Ltd’s proposed approach to handling agricultural property matters, providing a single source of information for all those affected. There will eventually be a bespoke guide for each affected farmer.

Air quality

- 3.23 In existing Air Quality Management Areas, the construction of HS2 Phase One is not anticipated to have significant adverse impacts on air quality, with the exception of the London Metropolitan area. The impacts in the London Metropolitan area are most likely to arise from HS2-related construction traffic and highway interventions (road closures and diversions).
- 3.24 At some locations in the London Metropolitan area where there are HS2 construction activities, air quality issues already exist due to highway traffic emissions, and these

will be exacerbated by significant effects expected from the scheme. In recognition of this, the nominated undertaker intends to work closely with local authorities and other stakeholders to manage these significant effects. In particular, the Government has given assurances to the London Borough of Camden, as the route wide lead authority for air quality issues, that baseline air quality monitoring will be put in place where significant effects are predicted. In places where, following the detailed design stage, significant effects are still expected to occur during HS2 construction, air quality monitoring will be continued. In addition, an air quality action plan will be drawn up, working with the local authority, with the objective of removing the significant effects, as soon as, and as far as, practicable.

- 3.25 The Code of Construction Practice 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 boundary fences and hoardings at construction sites, the covering of material stockpiles and the control of construction equipment exhaust emissions. Additional assurances have been provided to the London Borough of Camden in response to their petition in the House of Lords with respect to implementing more stringent Non-Road Mobile Machinery emissions standards than the requirements of the Greater London Authority and improving the monitoring of air quality impacts arising from construction. In addition, best practice targets have been set for the emissions performance of contractor vehicles on the road.
- 3.26 A number of air quality assurances had already been given to the London Borough of Camden through the Commons Select Committee process, including that all HGVs used for the purpose of transporting excavated material in the London Low Emission Zone will comply with the EURO VI standard. Further assurances have since been given that the nominated undertaker will ensure that all contractors comply with an enforcement regime for the use of EURO VI compliant vehicles and a fleet percentage target for light vehicles below 3.5 tonnes, used by contractors to serve HS2 worksites. The use of cars by contractors is expected to be minimal during HS2 construction in London. Contractors shall also aim to adopt Ultra Low Emission cars (or ULEVs) from the start of works under the act, working towards a target of 100% ULEV use over the course of their contract, depending on the contract size, duration and vehicle activity.
- 3.27 Further information on this subject can be found in Information Papers E13: Management of Traffic During Construction, D3: Code of Construction Practice, E6: Mitigation of Significant Community Effects on Public Open Space and Community Facilities, C13: Local Authority Funding and New Burdens arising from HS2 and E31: Air Quality.

Community and socio-economic impacts

- 3.28 Phase One of HS2 will bring socio-economic benefits to many communities through encouraging the development of skills, the creation of jobs and encouraging regeneration around HS2 stations.
- 3.29 The minimisation or removal of significant community and socio-economic impacts has been an active consideration in the design of the scheme. For example, the alignment of the Phase One route between Crackley Wood and Stoneleigh Road in

Warwickshire was moved after the 2011 public consultation so that it is further away from farm buildings at Milburn Grange, listed buildings at Dale House Farm, and the boundary of Kenilworth Golf Club. The alignment was also lowered in this area to mitigate impacts at the National Agricultural Centre at Stoneleigh Park and allow it to continue to operate.

- 3.30 There are, however, areas along the line of route where adverse community impacts remain, including the demolition or partial loss of dwellings, open space and community facilities, along with the displacement of businesses and the effects of construction traffic. To mitigate these residual impacts the Government has set out a number of measures through HS2 policies and the provision of assurances and has made changes to the HS2 scheme via Additional Provisions.
- 3.31 For businesses, besides existing statutory provisions such as those provided by the statutory Compensation Code, the Promoter has committed to a range of additional measures designed to enable them to continue to operate during construction, to remain in situ for as long as practicable, and to support them in making planned relocations. These additional measures include a commitment that the nominated undertaker will create an agency service to support businesses with land taken by HS2, which will work with affected business to understand their requirements and identify alternative sites for relocation. The Government 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 should minimise the number of jobs lost permanently or displaced as a consequence of the HS2 Phase One scheme.
- 3.32 A separate Business and Local Economy Fund (BLEF), for capital or revenue grants from £10,000 to £1 million, is also available to support disrupted local economies. The BLEF will provide funding for initiatives such as running events that encourage tourists to visit an area or improved cycling and pedestrian access to local economic centres.
- 3.33 For communities demonstrably disrupted by HS2 the Government has created a Community and Environment Fund to support local communities' quality of life. The kinds of projects such funding is available for include the enhancement of sports and recreational facilities, new community facilities and enhancements to public open space.
- 3.34 Beyond these measures, negotiations with stakeholders and directions from the Commons Select Committee have introduced measures to the scheme to support particularly affected local communities such as those around Euston and Old Oak Common. For instance, assurances have been given to the London Borough of Ealing that the nominated undertaker will fund and take account of a study for potential public realm restoration works at Victoria Road and Old Oak Common Lane, while in Euston an assurance has been given to require the nominated undertaker to fund the reasonable costs (up to £160,000) of the London Borough of Camden fitting out facilities for the use of the Motorcycle Club that was expected to close as consequence of HS2 works.
- 3.35 Where it has been reasonably practical to support a positive community legacy, the Promoter has sought to do so through assurances and changes to the design of the railway. For example, assurances have been given to Aylesbury Vale District Council

about the detailed design of the scheme on the south west edge of Aylesbury to support their aspiration to create a linear park there.

- 3.36 Further information on this subject can be found in Information Papers G1: Consultation and Engagement, G2: Community Relations, G4: Approaches to Training and Employment, G7: Education Programme, C12: The Community and Environment Fund and Business and Local Economy Fund and E6: Mitigation of Significant Community Effects on Public Open Space and Community Facilities.

Cultural heritage

- 3.37 The Code of Construction Practice provides mechanisms to minimise the impact of works on all heritage assets. The Heritage Memorandum sets out the Secretary of State's commitment to the historic environment (including heritage assets and their setting) during the design and construction of Phase One of HS2. 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 One is carried out with due regard for heritage assets.
- 3.38 Phase One of HS2 will not require the demolition of any Grade I or Grade II* listed buildings, although a section of an estate boundary wall - a curtilage structure to a grade 1 building - will be removed. Schedule 18 to the Bill disapplies elements of the Planning (Listed Buildings and Conservation Areas) Act 1990. In relation to listed buildings directly affected by HS2 works, those proposed for alteration, demolition or modification are named in Table 1 of Schedule 18. The listed buildings named in Table 2 of Schedule 18 are those where works may be required to protect and/or restore their character. 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.
- 3.39 Historic environment studies were undertaken as part of the environmental impact assessment for HS2 Phase One. 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.
- 3.40 All human remains affected by HS2 works will be afforded due dignity, care and respect. Burial grounds have been avoided as far as practicable during the development of the scheme design. Where avoidance has not been practicable, every attempt will be made to limit the impact on burials grounds during the development of the detailed scheme design.
- 3.41 For further details see HS2 Information Papers D3: Code of Construction Practice, E8: Archaeology, E12: Burial Grounds and the Draft Environmental Minimum Requirements Annex 3: Draft Heritage Memorandum.

Ecology and forestry

- 3.42 HS2 Phase One has been designed so as to avoid or reduce adverse impacts on habitats, protected species and other features of ecological value, where reasonably practicable. For example, in the Waddesdon and Quainton area the project has been designed to avoid taking land from the adjacent Sheephouse Wood Site of Special Scientific Interest (SSSI), designated for the quality of its ancient woodland. Through the route selection process the Phase One railway avoided impacts on any internationally designated sites and impact on only three Sites of Special Scientific Interest and one local nature reserve.
- 3.43 Where adverse impacts cannot be avoided, mitigation and compensation measures have been included to reduce effects on species and habitats. These mitigation measures are specific to the nature of the impact and species effected. For instance, green bridges have been included at Calvert Green and School Hill Green in Buckinghamshire to maintain safe movement and dispersal of animals and plants (particularly Bechstein's Bat, a rare European Protected Species) from one side of the railway to the other, after ecology surveys demonstrated their presence in this area.
- 3.44 HS2 Ltd's stated ambition is to achieve a 'no net loss' in biodiversity on a route-wide basis despite the absence of a statutory requirement to do so. 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 indicate an overall loss of 3% based on the value of habitats measured by area.
- 3.45 The Commons Select Committee, in its Second Special report of session 2015-16, asked the Department to identify an independent third party arbiter to review the different net loss metrics and publish its findings so that HS2 Ltd could be challenged on its figures if appropriate. The Government appointed Natural England to undertake this review and their subsequent report was published in November 2016. Natural England make a total of 21 recommendations relating to multiple aspects of HS2 Ltd's no net loss of biodiversity metric, however their primary recommendation was that where new woodland planting is used to compensate for ancient woodland losses, they judged that 30 hectares should be planted for each hectare lost.
- 3.46 Natural England accepted, however, that there was very little evidence to support the 30:1 ratio and for that reason, the Government could not accept the recommendation as it stood. HS2 Ltd is using a combination of approaches to compensate for the ancient woodlands lost during construction, including:
- relocating soils from the woodland affected by construction to other woodlands to improve their biodiversity;
 - restoring existing ancient woodland; and
 - planting new woodland.
- 3.47 In addition, in response to Natural England's call for greater ambition, the Government has committed to providing £5 million of funding to support third party woodland planting initiatives.

- 3.48 Where ecological mitigation is created along the HS2 Phase One route, the Government has committed to ensuring that appropriate measures are in place to manage, maintain and monitor the performance of those habitats and intends to develop, in consultation with Natural England, 'success criteria' to measure the performance of these habitat areas. An assurance was also given to establish an independent Ecology Review Group, the members of which will include local authorities and nature conservation NGOs such as the Wildlife Trusts. This group will have regular access to the monitoring outputs from habitat creation sites and will be invited to comment on progress and the requirement for any remedial measures.
- 3.49 For further information see Information Papers E2: Ecological Impact, E11: Green Infrastructure and the Green Corridor, E15: Green Bridges, E26: Indicative Periods for the Management and Monitoring of Habitats Created for HS2 Phase One and D3: Code of Construction Practice.

Landscape and visual amenity

- 3.50 The Proposed Scheme 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.
- 3.51 Local planning authorities will gain powers to determine the detailed design and appearance of landscape earth works under Schedule 17 of the 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'.
- 3.52 Information Paper D1: Design Policy 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, depot buildings and key ventilation shafts in sensitive areas.
- 3.53 Further revisions to the scheme have resulted in additional measures to minimise the residual landscape and visual impacts. In the Chilterns AONB, at the direction of the House of Commons Select Committee, the Chiltern tunnel has been extended from Mantle's Wood near Hyde Heath to the northern side of South Heath. This combined with the revised depth of cutting where the tunnel emerges, will reduce the visual impact of the HS2 line and help maintain the continuity of the landscape in this area. Similarly smaller scale changes have been introduced at other locations, for example under Additional Provision 2, deposited during the Commons Select Committee stage, additional raised landscaped earthworks will be created along the edges of the A4010 Stoke Mandeville Bypass to ensure that the realigned road does not have an adverse visual impact on residents nearby.
- 3.54 Through the Commons and Lords Select Committee stages, HS2 Ltd 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 Chilterns Conservation Board, Chiltern District Council, Aylesbury Vale District Council and Wycombe District Council, that the nominated undertaker will engage with these parties prior to the completion of the design phase to create key principles for the design and appearance of HS2 works in the AONB. In addition, assurances have been given to South Buckinghamshire District Council on the creation of a Colne Valley Park Design Panel for stakeholders to bring forward mitigation and restoration proposals to enhance the Regional Park.

- 3.55 For further details see HS2 Design Vision, HS2 Landscape Design Approach, The Mitigation and Integration of HS2 within the Chilterns AONB, and HS2 Information Papers D1; Design Policy, E11: Green Infrastructure and The Green Corridor and E16: Maintenance of Landscaped Areas.

Noise and vibration

- 3.56 The Promoter's approach to assessing, controlling and monitoring noise and vibration from the operational Phase One railway, and its construction phase, are set out in HS2 Information Papers (see paragraph 3.60 below). The approach to these matters set out in the Information Papers represents HS2 Ltd's interpretation of the Government's 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.
- 3.57 The LOAELs for operational noise have been derived with consideration of the World Health Organisation 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 One, therefore, have due regard to established practice, research results, guidance in national and international standards, guidance from national and international agencies and independent review by academic, industry and Government employees, along with the HS2 Ltd's representatives on review groups.
- 3.58 Since their first publication, the Information Papers have been amended following negotiations with the Local Authority Noise Consortium (LANC). Most significantly, a new Information Paper (F4: Operational Noise and Vibration Monitoring Framework) was introduced at the request of LANC, setting out a regime for monitoring the performance of noise and vibration control measures throughout the railway's operational phase. Measures set out in this paper include the requirement to share with local authorities the predicted and measured data on operational noise and vibration. These measures will improve the existing performance of the railway and prevent loss of performance. Through the Lords Select Committee process, updates were also made to IP E23: Control of Construction Noise and Vibration, to include specific criteria that will be used to determine whether residents living near construction need to be temporarily rehoused.
- 3.59 The draft Code of Construction Practice also includes measures to control and monitor noise and vibration during construction. The draft Code of Construction

Practice includes 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. Where noise and vibration exposure is predicted to, or does in fact, exceed certain levels, noise insulation or ultimately temporary rehousing will be employed by the nominated undertaker.

- 3.60 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 LOEAL (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.
- 3.61 The control of noise impacts from the Phase One route has been achieved firstly through sensitive design, avoiding noise-sensitive locations and keeping the alignment low within the landscape where reasonably practicable and the provision of tunnels beneath high ground and densely populated urban areas. 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.
- 3.62 These existing measures to mitigate operational noise have been enhanced through the Select Committee processes. For example, Additional Provision 5, deposited during the Commons Select Committee stage, includes additional noise barriers at both the northern and southern portals of the Wendover cut-and-cover tunnel. Furthermore, an assurance has been given to South Buckinghamshire District Council that the nominated undertaker will implement a 3m noise barrier (or other noise mitigation measures which deliver the equivalent performance) to remove 44 of the 48 minor adverse noise impacts at residential properties in South Harefield.
- 3.63 For further details see HS2 Information Papers E20: Control of Airborne Noise from Altered Roads and the Operational Railway, E21: Control of Ground-Borne Noise and Vibration from the Operation of Temporary and Permanent Railways, E22: Control of Noise from the Operation of Stationary Systems, E23: Control of Construction Noise and Vibration, F4: Operational Noise and Vibration Monitoring Framework and D3: Code of Construction Practice.

Settlement

- 3.64 The best way to mitigate against settlement is through the use of good tunnelling practice, including continuous working, erecting tunnel linings immediately after excavation and exercising tight control over the tunnelling process. 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 is based on robust, conservative, assumptions.

- 3.65 The Government 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 One, 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.
- 3.66 See HS2 Information Paper C3: Ground Settlement for further information.

Traffic and transport

- 3.67 HS2 Phase One will have significant net benefits for traffic and transport, releasing capacity on the existing rail network and improving connections between London, Birmingham and beyond.
- 3.68 The Bill and Code of Construction Practice provide a number of mechanisms through which qualifying planning authorities and local highway authorities will be involved in, and given oversight of, potential impacts in their area. They are consulted in the preparation of Traffic Management Plans, and construction workforce travel plans and have powers to control worksite hours of operation to regulate the flow of vehicle movements. The Bill includes powers for the control of construction traffic, requiring qualifying authorities to approve routes to be used by large goods vehicles where the number of large goods vehicles exceeds 24 trips per day, to or from a site. 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 local highway authority is required to approve details of new or realigned carriageways and can refuse approval on grounds such as safety.
- 3.69 There is in addition an over-arching statutory duty on the nominated undertaker in relation to impacts on traffic. Under Part 1 of Schedule 32 to the Bill it must, in exercising the powers of the 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.
- 3.70 Through negotiations throughout the Select Committee stages in both Houses, further local mitigation measures have been introduced to the scheme to reduce or remove traffic and transport impacts. For example, an undertaking has been given to Northamptonshire County Council regarding the creation of a bypass at Chipping Warden, which will be of a permanent benefit to the local community. A haul road was included in Additional Provision 4 in Ickenham to reduce the volume of construction traffic from public highways. In Camden where the addition of construction traffic associated with HS2 works is a particular concern, an assurance

has been given to the London Borough of Camden that the nominated undertaker will seek to maximise, in so far as reasonably practicable, the volume of excavated and construction material from the construction of Euston Station and approaches brought in and removed by rail. 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.

- 3.71 The Government has separately announced a £30 million road safety fund that will be used to make improvements to places along the line of route – for instance to support traffic calming, safer junctions or better pedestrian crossings. Further details on this fund will be announced in due course.
- 3.72 The development of the HS2 Phase One scheme has also taken account of, where reasonably practicable, the ambitions of different bodies in introducing new transport schemes. For instance, an assurance has been given to Aylesbury Vale District Council (AVDC) requiring the nominated undertaker to engage with AVDC on the phasing and timetable of construction works in the Calvert area. This includes the provision of any relevant updates regarding the interface between HS2 construction works and construction works associated with the proposed East-West rail project, so as not to frustrate this possible future development.
- 3.73 For further information see Information Papers E5: Roads and Public Rights of Way, E14: Highways and Traffic During Construction — Legislative Provisions and E13: Management of Traffic During Construction.

Waste and material resources

- 3.74 HS2 Ltd will apply the waste hierarchy to decisions concerning the management of waste. The waste hierarchy as described in the Government Review of Waste Policy in England 2011 sets out the preferred approach to the management of waste from waste prevention, to reuse, recycling, energy recovery and landfill as the last resort.
- 3.75 The construction of the Proposed Scheme will lead to the generation of approximately 130 million tonnes of excavated material, over 86% of which will be reused within the project for the construction of engineering and environmental mitigation earthworks. 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, provided that the transportation of that material does not result in significant environmental effects.
- 3.76 Through directions given by the House of Commons Select Committee and stakeholder engagement, waste management in particular locations has already been improved that will reduce the impact of the scheme on local people. For instance, ‘sustainable placement’ at locations such as Hunts Green Farm have been replaced with temporary material stockpiles, which will be used to regulate the flow of excess material onto public highways in the vicinity. The proposed sustainable placement in the Calvert area has also been removed.

3.77 For further information see Information Papers E3: Excavated Material and Waste Management Strategy, and E19: Sustainable Placement of Surplus Excavated Material.

Water resources

3.78 HS2 Ltd has designed the Phase One railway to avoid, reduce and mitigate potential impacts from the scheme on water resources, including groundwater.

3.79 The Bill contains important protective provisions that provide the Environment Agency with approval powers for HS2 works affecting land drainage, flood defence, water resources and fisheries. Detailed agreements have also been reached with utility providers such as Severn Trent and Thames Water, which supplement the protections for their assets in the Bill.

3.80 HS2 Ltd has also undertaken a comprehensive Water Framework Directive (WFD) assessment of Phase One. The assessment is compliant with the WFD and includes a recent update, to take into account a legal ruling in the Courts of Justice in the European Union (CJEU) which changed the definition of deterioration of a waterbody. The nominated undertaker will require contractors to keep this assessment and any derogations up to date to maintain compliance with the WFD up to the point of completion of construction. The updated assessment was deposited in Parliament in March 2016.

3.81 Structures along the route have been designed to ensure the quality of watercourses is not adversely affected. For example the design of the Colne Valley Viaduct has been realigned so that none of the viaduct's piers would be placed in the River Colne avoiding direct impacts on the water course. The detailed design process will be used to further reduce or remove any residual impacts. The draft Code of Construction Practice contains measures for the protection of ground and surface water during the construction phase of the project.

3.82 Phase One includes measures to control the rate, volume and quality of water run-off from the HS2 rail corridor and other associated infrastructure. This includes features such as balancing ponds and replacement flood storage areas. Where the railway and associated works has 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 of the NPPF) during the lifetime of the development, taking projected climate change impacts into account.

3.83 For further information see Information Papers E4: Water Resources and Flood Risk, E17: Balancing Ponds and E9: Climate Change Adaptation and Resilience.

4. Need for and benefits of HS2 Phase One

- 4.1 The Government is committed to building a stronger, more balanced economy capable of delivering lasting growth and widely shared prosperity. For rail transport, the Government has stated the following key objectives:
- to provide sufficient capacity to meet long term demand, and to improve resilience and reliability and the network; and
 - to improve connectivity by delivering better journey times and making travel easier.
- 4.2 The Government has made clear that the solution to meet these key objectives must be affordable and represent good value to the taxpayer, keep both disruption to the existing rail network and impacts on local communities and the environment to the minimum, and deploy proven and effective technology.
- 4.3 The Government's case for a new north-south high speed rail network is primarily to ensure that the inter-urban rail network supports the economic development of the country by providing sufficient increased capacity and improved connectivity between major urban centres. This will help build a stronger, more balanced economy capable of delivering lasting growth and widely shared prosperity.
- 4.4 The Government has firmly established the capacity challenge that exists on our rail network, with rail demand continuing to increase above the forecasts of the 2013 Strategic Case⁶. The need for additional capacity will become ever more increasingly pressing on Britain's key north-south inter-urban rail routes, particularly on the West Coast Main Line from the mid-2020s. This will result in increased overcrowding significantly above today's levels and decreasing levels of resilience and reliability.
- 4.5 The Government carefully considered a range of alternatives to HS2, which include:
- Upgrades to the existing rail network;
 - The use of alternative modes; and
 - a new conventional speed railway line.
- 4.6 We have firmly established that these alternatives do not deliver the transformational effects upon capacity and connectivity of HS2 and therefore fail to achieve our overarching economic aim.
- 4.7 Further incremental upgrades to the existing north-south rail network will be insufficient to provide the necessary capacity and improved performance required to

⁶ www.gov.uk/government/collections/the-strategic-case-for-hs2

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 would be needed to meet our objectives.

- 4.8 The Government has concluded that building new classic 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. Classic rail lines would also deliver far fewer benefits in terms of enhanced connectivity and support for long-term economic growth.
- 4.9 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.
- 4.10 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 travel demands from a growing population and economy and improved connectivity to bring people and businesses together to support growth.
- 4.11 HS2 will transform the country, supporting growth in the north by improving connectivity and therefore rebalancing our economy, promoting regeneration, boosting local skills, generating tens of thousands of jobs and helping to secure the UK's future prosperity.
- 4.12 The benefits of HS2 Phase One in particular would include:
- Benefits to transport users in excess of £20bn and Wider Economic Impacts of over £4bn – the benefits of Phase 1 are estimated to outweigh the costs of building and operating the railway by a factor of 1.7;
 - Improvements to connectivity by delivering better journey times and making travel easier;
 - Providing sufficient capacity to meet long term demand, and to improve resilience and reliability across the network;
 - The potential to support the efficient movement of people and freight, which is essential for economic growth as enhanced capacity and good connectivity strengthen the links between businesses, workers and customers and remove geographical barriers to markets;
 - Create opportunities for regeneration by improving connectivity and in effect bringing cities closer together – opening up new markets, new job opportunities, and new opportunities for growth;
 - Provide a railway that is fit for the 21st Century, with trains, stations and associated facilities that will be fully accessible to all passengers and provide efficient access to other rail networks and other transport modes;
 - Attract passengers from private cars, reduce the number of road accidents and generate new public transport revenue projected to be worth at least £13bn; and
 - Improve connectivity between Heathrow airport and the north, via the Old Oak Common interchange (for example reducing the journey time between Birmingham and Heathrow to less than an hour).

- 4.13 It should also be noted that the full HS2 network is estimated to support up to 25,000 construction jobs, 3,100 permanent operation and maintenance jobs and up to 100,000 jobs supported by development around HS2 stations, when operational.
- 4.14 For more information on the need for, and benefits of, HS2 see the Strategic Case for HS2 published in October 2013, the Supplement to the Strategic Case for HS2 published in November 2015 and Chapter 4 of the Main ES.

5. Summary and conclusion

- 5.1 HS2 Phase One 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 and the network. In delivering these benefits, HS2 Phase One is affordable and represent good value to the taxpayer.
- 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 environmental effects. Beyond this the project has also committed to continue to look for ways to further reduce the overall adverse impacts. 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 is, therefore, more than satisfied that, taking into account its environmental effects and the comments received on these during the Parliamentary process, HS2 Phase One remains worthy of its continuing support.
- 5.3 A summary of the reasons for the Government's proposal to endorse the HS2 Phase One 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 One

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 One on which the Government has formed the view that HS2 Phase One 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 (as amended and supplemented)
- The responses to the consultations on the main ES and each APES and SES
- The Strategic Case for HS2 published in October 2013 and the Supplement to the Strategic Case for HS2 published in November 2015
- Main alternatives considered in the Environmental Statement

Main factors taken into account:

- Agriculture, forestry and soils
- Air quality
- Community and socio-economic impacts
- Cultural heritage
- Ecology
- Landscape and visual amenity
- Noise, vibration
- Settlement
- Traffic and transport
- Waste and material resources
- Water resources

Main mitigation measures:

- 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:
 - The Chiltern tunnel extension
 - The route realignment at Lichfield
 - The realignment and extension of the Burton Green tunnel
 - The provision of a viaduct, instead of an embankment at Hampton
 - The provision of additional noise mitigation measures at various locations, including the Colne Valley, Radstone, Wendover and Chetwode

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
- Improving connectivity between Heathrow airport and the north

Annex B: List of HS2 Information Papers and other sources of information

This appendix lists various sources of information that the Department considers may be relevant to the consideration of the environmental effects of the HS2 Phase One proposals, including websites from which further information can be obtained.

1. Environmental Statement

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

Document	Deposit Date
Environmental Statement (together with an addendum) and accompanying NTS	25 November 2013
Additional Provision 2 Environmental Statement and accompanying NTS	9 September 2014
Supplementary Environmental Statement and Additional Provision 2 Environmental Statement and accompanying NTS	13 July 2015
Supplementary Environmental Statement 2 and Additional Provision 3 Environmental Statement and accompanying NTS	16 September 2015
Supplementary Environmental Statement 3 and Additional Provision 4 Environmental Statement and accompanying NTS	12 October 2015
Supplementary Environmental Statement 4 and Additional Provision 5 Environmental Statement and accompanying NTS	2 December 2015

Electronic copies of the Environmental Statement documents are available at: <https://www.gov.uk/government/collections/high-speed-rail-london-west-midlands-bill>

2. ES Consultation Independent Assessor Reports

Document and weblink	Date Published
Report of the Independent Assessor on comments on the Main Environmental Statement www.parliament.uk/documents/commons-private-bill-office/2013-14/HS2-Independent-Assessor-report.pdf	9 April 2014
Additional Provision (AP1): Report of the Independent Assessor on comments on the Supplementary Environmental Information www.parliament.uk/documents/commons-private-bill-office/2014-15/HS2-Independent-Assessor-Additional-Provision-report.pdf	16 December 2014
Additional Provision (AP2): Summary of Issues raised by comments on the Supplementary Environmental Statement and AP2 Environmental Statement www.parliament.uk/documents/commons-committees/hs2/HS2-Independent-Assessor-Additional-Provision-Supp-Enviro-AP2-ES-report.pdf	3 November 2015
Additional Provision (AP3): Summary of Issues raised by comments on the Supplementary Environmental Statement 2 and AP3 Environmental Statement www.parliament.uk/documents/commons-committees/hs2/HS2_AP3%20Report_FINAL.pdf	16 December 2015
Additional Provision (AP4): Summary of Issues raised by comments on the Supplementary Environmental Statement 3 and AP4 Environmental Statement www.parliament.uk/documents/commons-committees/hs2/HS2-Independent-Assessor-Additional-Provision-Supp-Enviro-AP4-ES-report.pdf	11 February 2016
Additional Provision (AP5): Summary of Issues raised by comments on the Supplementary Environmental Statement 3 and AP4 Environmental Statement www.parliament.uk/documents/commons-committees/hs2/HS2-Independent-Assessor-Additional-Provision-Supp-Enviro-AP5-ES-report.pdf%20.pdf	24 February 2016

3. 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 One project.

Series	Information Paper Title
Route Development	
A1	Development of the HS2 Proposed Scheme
A2	Future train service patterns on the West Coast Main line
Understanding the hybrid Bill	
B1	The Main Provisions of the Planning Regime
B2	Limits on Parliamentary Plans
B3	Disapplication of Legislation
B4	Compliance with Undertakings and Assurances
B5	Environmental Impact Assessment and Human Rights
B6	Railway Powers in the Hybrid Bill
B7	Time Limits in the HS2 Bill
B8	Additional Provisions
B9	Introduction to Hybrid Bill Powers
B10	High Speed Rail (London – West Midlands) Bill as amended in the House of Commons Select Committee
Property, Compensation and Funding	
C1	Information for Property Owners
C2	Rural Landowners and Occupiers Guide
C3	Ground Settlement
	Annex A – Qualifying Criteria for Deed Concerning Settlement
	Annex B – Settlement Deed
C4	Land Acquisition and Disposal Policy
C5	Safeguarding
C6	Disposal of Surplus Land
C7	Business Relocation
C8	Compensation Code for Compulsory Purchase
C9	Recovery of Costs by Property Owners

C10	Small Claims Scheme
C11	Regeneration, Compulsory Purchase Policy and Over Site Development
C12	The Community and Environment Fund and Business and Local Economy Fund
C13	Local Authority Funding and New Burdens arising from HS2
C14	Site Access for Surveys
Construction	
D1	Design Policy
D2	Selection and the Location of Construction Compounds
D3	Code of Construction Practice
D4	Working Hours
D5	Inclusive Design Policy
D6	HS2 Phase One Construction Timetable
D7	Tunnel Construction and Methodology
D8	Tunnel Shafts and Portals
D9	Maintenance of Public Utilities
D10	Worksite Security
D11	Maintaining Access to Residential and Commercial Property During Construction
D12	Track Possessions for HS2 Phase One Engineering Work
Environment	
E1	Control of Environmental Impacts
E2	Ecological Impacts
E3	Excavated Material and Waste Management Strategy
E4	Water Resources and Flood Risk
E5	Roads and Public Rights of Way
E6	Mitigation of Significant Effects on Public Open Space and Community Facilities
E7	Land Quality
E8	Archaeology
E9	Climate Change Adaptation and Resilience
E10	Carbon
E11	Green Infrastructure and the Green Corridor
E12	Burial Grounds
E13	Management of Traffic During Construction
E14	Highways and Traffic During Construction- Legislative Provisions
E15	Green Bridges
E16	Maintenance of Landscaped Areas

E17	Balancing Ponds and Replacement Flood Storage Areas
E18	Approach to Sustainability
	Annex 1 HS2 Ltd's Sustainability Policy
E19	Sustainable Placement of Surplus Excavated Material
E20	Control of Airborne Noise from Altered Roads and the Operational Railways
	Appendix A – HS2 Phase One airborne noise policy for altered roads and the operational railway
	Appendix B – Operational airborne noise impact and effect levels from altered roads and the operational railway
	Appendix C – Glossary
E21	Control of Ground-borne Noise and Vibration from the Operation of Temporary and Permanent Railways
	Appendix A – HS2 Phase One operational Ground-borne Noise and Vibration Policy
	Appendix B – Ground-borne noise and vibration impact and effect levels from the operational railway
	Appendix C – Glossary
E22	Control of Noise from the Operation of Stationary Systems
E23	Control of Construction Noise and Vibration
	Appendix A – HS2 Construction Noise and Vibration Policy
	Appendix B – Noise insulation and temporary re-housing policy
E24	Private means of access
E25	Authorising works affecting watercourses
E26	Indicative Periods for the Management and Monitoring of Habitats
E27	Land Drainage
E28	Mitigation and Compensation
E29	Future Highways Maintenance Responsibilities
E30	Vehicle Flow Management & Safety during Construction
E31	Air Quality
E32	Guide to the Environmental Statement
E33	Soil Handling for Land Restoration
Operations	
F1	Rolling Stock Depot and Stabling Strategy
F2	Infrastructure Maintenance Depot Strategy
F3	Rail Freight Operations
F4	Operational Noise and Vibration Monitoring Framework
Consultation	
G1	Consultation and Engagement

G2	Community Relations
	Appendix A – HS2 Residents’ Charter
G3	Construction Commissioner
G4	Approach to Training and Employment
G5	Equality, Diversity and Inclusion policy
G6	Design Development – Detailed Design and the role of Planning Authorities
G7	Education Programme
G8	National College for High Speed Rail
Station and Key Locations	
H1	Birmingham Curzon Street Station
H2	Birmingham Interchange Station
Rail Industry Issues	
J1	Future Operation and Commercial issues

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

www.gov.uk/government/collections/high-speed-rail-london-west-midlands-bill#information-papers

Please note that these are in the process of being updated following the conclusion of the House of Commons Select Committee process and that the most recent versions will be available on-line.

4. HS2 Phase One 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 four 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 at:

www.gov.uk/government/publications/environmental-minimum-requirements

5. 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.

www.gov.uk/government/publications/hs2-strategic-case

Supplement to the Strategic Case for HS2 (November 2015)

This document provides an update to some of the evidence set out in the 2013 Strategic Case, drawing upon further analysis commissioned by DfT of the latest levels of passenger demand and forecast growth, as well as patterns of business travel.

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

Draft HS2 Phase One Register of Undertakings

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

www.gov.uk/government/publications/high-speed-rail-london-west-midlands-bill-register-of-undertakings-and-assurances

6. Websites

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

www.parliament.uk/business/committees/committees-a-z/commons-select/high-speed-rail-london-west-midlands-bill-select-committee-commons/

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

<https://www.parliament.uk/business/committees/committees-a-z/lords-select/high-speed-rail-london-west-midlands-bill-select-committee-lords/>

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

www.gov.uk/government/organisations/high-speed-two-limited

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

www.gov.uk/government/collections/high-speed-rail-london-west-midlands-bill

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