
High Speed Two Phase 2b
Crewe to Manchester,
West Midlands to Leeds
Response to
HS2 Phase Two Consultation: Appraisal
of Sustainability (Question 7)





Department for Transport

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Executive summary

In July 2013 the Secretary of State launched a seven-month period of public consultation on proposals for Phase Two of High Speed Two (HS2), the high speed rail network from the West Midlands to Manchester, Leeds and beyond. Phase Two follows on from Phase One, the route from London to West Midlands, which is at a more advanced stage of development and approval.

Amongst other questions, the Phase Two public consultation asked for responses on the Appraisal of Sustainability (AoS) process (question 7 of the consultation questions). The findings of the AoS for the Phase Two scheme were reported in detail in the *Sustainability Statement - Volume 1: main report of the Appraisal of Sustainability, 2013*¹. The AoS process has been used to help HS2 Ltd take account of sustainability issues at each stage of Phase Two's development.

Consultation on Phase Two closed at the end of January 2014. The collation of responses to the consultation was independently carried out by Ipsos MORI, which has prepared an independent Consultation Summary Report summarising the overall response to the Phase Two consultation. The report was published as part of the route decision on the section of route between the West Midlands and Crewe, referred as Phase 2a (see www.gov.uk/hs2). The report provides an HS2 Ltd response to feedback from question 7 of the consultation, regarding the AoS. This is achieved by addressing concerns raised and providing details on the next steps. An earlier version of this report was published in support of the decision on Phase 2a in November 2015. This report has been updated in light of developments in policy and legislation.

We received a wide range of consultation responses from individuals and organisations in response to the AoS. Whilst a number of responses were supportive of HS2 and our approach to sustainability, many of the responses raise concerns regarding Phase Two, and HS2 more widely, in regard to sustainability.

We maintain that our approach to examining the impacts on the environment and communities through the AoS process remains robust and is appropriate for the purpose it was designed for.

Many of the issues raised will be appropriately addressed during the Environmental Impact Assessment (EIA) at the next stage of the project, this will include more detailed analysis of the design, environmental impact and potential mitigation options. The Environmental Impact Assessment Report (EIAR), will report the findings of the EIA and will accompany a hybrid Bill required to authorise the proposals.

¹Available online at:

http://assets.hs2.org.uk/sites/default/files/consultation_library/pdf/PC205%20Vol%201%20Sustainability%20Statement%20180713.pdf

1 Introduction

1.1 Context

- 1.1.1 HS2 is the Government's proposed high speed railway between London, Birmingham, East Midlands, South Yorkshire, Manchester and Leeds, with connections to the wider network. Proposals for Phase One of HS2, between London and the West Midlands, are well advanced. The Government deposited the Phase One hybrid Bill with Parliament in October 2013, through which it is seeking the necessary powers to construct and operate Phase One. The Phase One Bill has made good progress through Parliament and could be given Royal Assent by the end of this year.
- 1.1.2 Phase Two is at an earlier stage of development. Since 2010, HS2 Ltd and its consultants have developed, appraised and sifted several hundred options for routes, stations and depots. In July 2013, a seven-month 'High Speed Rail: Consultation on the route from the West Midlands to Manchester, Leeds and beyond' was launched, with a closing date for responses at the end of January 2014.
- 1.1.3 In November 2015 the Government announced its intention to bring forward construction of a 60km section of Phase Two between the West Midlands and Crewe (also known as 'Phase 2a'). This is part of the Government's ambition to bring benefits to the North sooner than originally planned. Phase 2a is expected to be operational by 2027. A separate hybrid Bill for Phase 2a is currently being developed, and is expected to be deposited with Parliament in 2017.
- 1.1.4 The remainder of the Phase Two route (referred to as 'Phase 2b') – from Crewe to Manchester and the West Coast Main Line on the west, and from the West Midlands to Leeds and the East Coast Main Line via the East Midlands and South Yorkshire on the east – is due to be announced by the Government this autumn. A post-consultation sustainability statement, which reports on the sustainability considerations of the Phase 2b route, has been produced².
- 1.1.5 The purpose of the Phase Two consultation was to give individuals and organisations the opportunity to put forward their views and comments on the Government's proposed scheme for consultation (referred to in this report as the 'proposed scheme'). As part of the suite of documents published for consultation, the Sustainability Statement reported on the findings of the Appraisal of Sustainability (AoS). The AoS is the process that allows for the appraisal of the performance of different route options by reporting the impacts on people and the environment at a high level, in order to aid early decision making.
- 1.1.6 The consultation asked a number of questions, of which question 7 pertained to the AoS as follows:

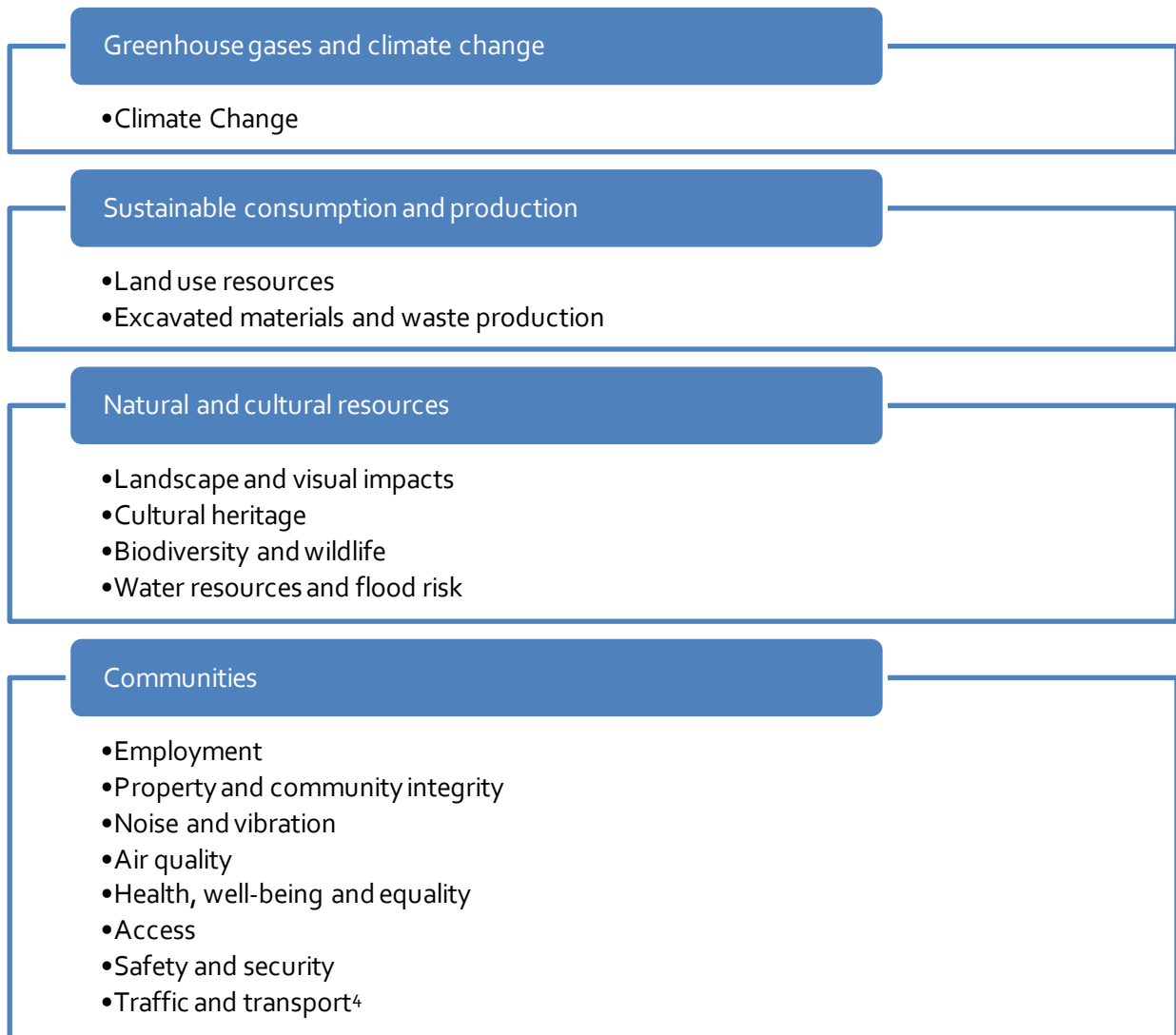
Please let us know your comments on the Appraisal of Sustainability (as reported in the Sustainability Statement) of the Government's proposed Phase Two route, including the alternatives.

² Further information about the announcement can be found at: <https://www.gov.uk/government/collections/hs2-phase-two-from-the-west-midlands-to-leeds-and-manchester>

1.1.7 Just over 10,000 responses were received during the consultation period, with around 1,400 responses relating to question 7. Responses were received via a number of different response channels, including online, hard copy, letters and emails, organised campaign responses and petitions. The responses were examined by Ipsos MORI, an independent response analysis company, and presented in a Consultation Summary Report.³ This report provides a HS2 Ltd response to feedback from consultation regarding question 7.

1.2 Structure of this report

1.2.1 The AoS addressed 18 sustainability topics derived from Government sustainability priorities. In responding to the comments raised on question 7, this report follows a similar approach to the AoS. Responses have been assigned to a sustainability topic and categorised under one of four headings, shown below.⁴



³ Ipsos MORI Consultation Summary Report, available online at: <https://www.gov.uk/government/consultations/hs2-phase-two-proposed-line-of-route-from-west-midlands-to-manchester-and-leeds>.

⁴ Not all topics covered in the Sustainability Statement are referenced in this report. This is due to lack of sufficient consultation feedback on that particular topic.

1.2.2 Each sustainability topic is presented in two parts in Sections 2 to 5 of this report. The first part sets out a 'summary of consultation views', where the main issues arising from consultation for each sustainability topic are presented, as per the Ipsos MORI Consultation Summary Report. The second part provides 'HS2 Ltd's response'.

1.2.3 Prior to Sections 2 to 5, the report briefly summarises how sustainability is considered as part of route development (section 1.3). Section 1.4 also reflects on how far the HS2 project has developed as a result of the more advanced Phase One.

1.3 HS2 and sustainability

1.3.1 The development of a new high speed rail network will undoubtedly have an impact on the environment and communities it passes. Sustainability considerations have therefore been at the forefront of the route development process. This is demonstrated in HS2 Ltd's Sustainability Policy,⁵ which sets out our approach to such issues.

1.3.2 The policy stresses HS2 Ltd's commitment to develop "an exemplar project", and to "limit [the project's] negative impacts through design, mitigation and by challenging industry standards, [while looking] for environmental enhancements and benefits". The policy uses seven themes as a focus for realising HS2's ambitions for promoting high speed rail and balancing community, environmental and economic issues.

1.3.3 The AoS is the process that allows for the appraisal of the performance of different route options by reporting the impacts on people and the environment at a high level in order to aid early decision making. It is important to note that the AoS process is applied by independent specialist consultants who work closely with the engineering consultants in developing and appraising options.

1.3.4 Once a preferred route is selected, the Environmental Impact Assessment (EIA) process will be used to help assess the likely significant impacts and identify relevant mitigation measures. The EIA would be presented as the project's Environmental Impact Assessment Report (EIAR) which is equivalent to the Environmental Statement (ES) produced for Phase One, and brought before legislators through the Parliamentary process.

Phase Two development

1.3.5 In developing Phase Two, a number of different factors and criteria have been taken into account. These include not only sustainability issues (as considered as part of the AoS process) but also engineering complexity, cost and benefits. In developing route options, HS2 Ltd has aimed to avoid key environmental features whilst also attempting to avoid communities. The proposed scheme presented at consultation in July 2013 was, on balance, considered to provide the best fit against the various criteria and the project remit.

1.4 Scheme development

1.4.1 HS2 Ltd policies and procedures in relation to the design, construction and operation of HS2 have further developed since consultation on Phase Two was undertaken in July 2013. Much of this information has naturally developed as a result of the more advanced Phase One of HS2.

⁵ Sustainability Policy, available online at: http://assets.hs2.org.uk/sites/default/files/pdf/es_maps_docs/Sustainability%20Policy.pdf

The Phase One Bill included a number of documents, not least a comprehensive ES. In addition, a number of other documents have been prepared which provide information on how HS2 Ltd would manage the environment in relation to design, construction and operation. The following list includes some of the documents produced for Phase One, all of which can be found online using the below links:

- Phase One Draft Code of Construction Practice (CoCP);⁶
- Phase One Draft Environmental Minimum Requirements (EMRs);⁷ and
- Phase One Information Papers⁸.

1.4.2 Additionally, as described in the Draft CoCP, Local Environmental Management Plans (LEMPs) will be prepared for each local authority area for Phase One. These will apply the generic measures set out in the Draft CoCP, to each local authority area.

1.4.3 It is likely that equivalent documents (to those described above) would be developed for Phase 2b to support the next stage of design.

⁶ The Draft CoCP is one of the EMRs. The CoCP was appended to the Phase One ES and deposited with the Bill; the EMRs were published as draft, but not deposited.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/259617/Vol5_draft_code_of_construction_practice_CT-003-000.pdf

⁷ The EMRs set out the high-level environmental and sustainability commitments that the Government will enter into through the hybrid Bill process. <https://www.gov.uk/government/publications/environmental-minimum-requirements>

⁸ The information papers explain the commitments made in the Phase One hybrid Bill and the EMRs and how they will be applied to the design and construction of the proposed scheme. They also provide information about the proposed scheme itself, the powers contained in the Bill and how particular decisions about the project have been reached. <https://www.gov.uk/government/collections/high-speed-rail-london-west-midlands-bill>

2 Greenhouse gases and climate change

2.1 Climate change

Summary of consultation views

2.1.1 A range of views were expressed on the carbon emission implications of HS2. Some people expressed views that HS2 would help to reduce carbon emissions, while others raised concerns that the proposed scheme would lead to a net increase in carbon emissions. Others expressed views that the carbon emissions from HS2 had not been examined in enough detail and some questioned how HS2 Ltd could claim net carbon savings from building and operating HS2 whilst the UK's energy system is reliant on fossil fuel as the primary source for generating electricity. There were also criticisms that the construction carbon footprint is very high for HS2 and that the AoS does not account properly for emissions relating to construction materials.

HS2 Ltd response

2.1.2 HS2 Ltd is committed (as set out in the Sustainability Policy, Carbon Minimisation Policy⁹ and as demonstrated by the endorsement of the Infrastructure Carbon Review) to minimising carbon emissions. The Sustainability Policy also sets out the objective to build a network which is resilient for the long term and which seeks to minimise the combined effect of the project and climate change on the environment.

2.1.3 The carbon assessment,¹⁰ published alongside the Economic Case in October 2013, provided information on the potential carbon impacts of HS2. The assessment included estimates of carbon emissions from a number of sources, each directly or indirectly related to the construction and operation of the railway.

2.1.4 We recognise that a number of the concerns raised through consultation were in regard to the uncertainty surrounding the carbon emission implications of HS2. To address uncertainty, the carbon assessment used two scenarios to illustrate two possible futures, with each accommodating a number of different assumptions about the way carbon emissions may change over time.

2.1.5 The assessment involved calculating the potential carbon emissions resulting from HS2's construction and operation, and potential reductions in carbon emissions (for example, as a result of people switching to high speed rail services in preference to other transport modes with higher carbon emissions) over the first 60 years (in line with the Economic Case for HS2 and standard methodology used by the Department for Transport) of operation of the full scheme.

⁹ Information Paper E10: Carbon (section 7), available online at: http://assets.hs2.org.uk/sites/default/files/hb_pdf/E10%20-%20Carbon%20v1.1.pdf

¹⁰ Sustainability Statement (2013) Appendix F – 'HS2 and Carbon', available online at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/400836/hs2ml-carbon_assessment_and_narrative-25thoct13_wed_tagged_version_-_updated_o.pdf

- 2.1.6 The assessment identified that high speed rail offers some of the lowest carbon emissions per passenger kilometre when compared with other transport modes, such as road, conventional rail and aviation. In addition, key carbon benefits will derive from the shift of passengers from these other modes onto HS2. Potential secondary carbon benefits may also arise by increasing the total carrying capacity of the rail transport system; HS2 would provide a means to free up capacity on existing rail networks. If this 'released capacity' can then be used to transfer freight or passenger traffic from higher-carbon modes such as road or aviation to the existing rail network, a further carbon benefit arises.
- 2.1.7 Benchmarking exercises illustrated that HS2's annualised construction and operation carbon emissions in 2030 against the UK's projected carbon footprint in 2030 represents a very small proportion (0.25%) of the UK's transport emissions and an even smaller portion (0.06%) of the UK's total carbon footprint (note that emissions projections are subject to frequent change). Furthermore, the carbon assessment identified that most of the carbon emissions associated with the construction and operation of HS2 will fall within the European Union Emissions Trading System (EU ETS) - a 'cap and trade' system with a decreasing cap over time. This means that, overall, most of HS2's carbon emissions will not contribute to an increase in Europe-wide carbon emissions.¹¹
- 2.1.8 Climate change is an important issue that we are addressing, and we will continue to do this as part of the more detailed assessments in the next stage of the project. At this stage of Phase Two, our approach is based on current guidance and best practice and is considered appropriate for the strategic-level nature of the AoS.
- 2.1.9 As part of an EIA, at the next stage of design, we will undertake further assessment of the carbon implications of HS2 and identify opportunities to minimise the carbon footprint as far as practicable in accordance with HS2 Ltd's Sustainability Policy and Carbon Minimisation Policy.

¹¹ The EU referendum decision is not expected to preclude ongoing negotiation on the EU ETS. The UK will continue to take part in such negotiations to ensure the best outcome.

3 Sustainable consumption and production

3.1 Land use resources

Summary of consultation views

- 3.1.1 Comments raised through consultation expressed concern over the destruction and loss of green belt land, with suggestions that the status of the green belt had not been given due consideration. Others took the view that building on green belt land could undermine the sustainability of HS2.
- 3.1.2 Similarly, concern was raised over the impacts on agricultural land, with comments suggesting HS2 may disrupt, destroy or lead to the severance of farms. Linked to this, there were also concerns raised over the impact that lost productive land may have on food security.

HS2 Ltd response

- 3.1.3 Through the design of Phase Two, HS2 Ltd has considered the impact on green belt land. The AoS considered potential impacts on green belt in terms of length crossed by the route as well as areas of potential landtake at stations and depots. Green belt is designated in the UK for controlling urban growth and preventing the coalescence of main urban areas. A railway through green belt may create pockets of land that are susceptible to development infill and that may conflict with the open and contiguous character for which green belt is designated. However, such infill development pressure would be subject to normal planning requirements, controlled by Local Authorities.
- 3.1.4 Agricultural land is the most common land use crossed by HS2; therefore, a loss of agricultural land is inevitable in the construction of a new railway. We aim to design a high speed railway that meets modern standards of design, environmental and community protection and makes the most sustainable use of agricultural land disturbed by the construction of HS2. This means that, in most cases, agricultural land will be restored to the same quality, but in some cases the design of the proposed scheme necessarily involves the conversion of land from agriculture to landscape planting and habitat creation to make it environmentally acceptable.
- 3.1.5 As part of the AoS process, in selecting the proposed route HS2 Ltd has been mindful of the highest quality agricultural land, balanced against a number of other environmental and engineering considerations. The National Farmers Union said in their consultation response that they were concerned that the AoS methodology only addressed Grades 1 and 2 agricultural land and not Grade 3a, which is also classed as 'best and most versatile'. At the AoS stage, HS2 Ltd could only rely on available information which provided complete coverage at the national scale. This information was restricted to the published series of reconnaissance Agricultural Land Classification (ALC) maps, showing five grades of land, but not subgrades 3a and 3b.
- 3.1.6 Consistent with the approach being taken on Phase One, where land is not required for operational purposes, HS2 Ltd will aim to ensure that agricultural land is restored and put back to agriculture following construction, where possible and appropriate. Where this occurs, topsoil (and subsoil where appropriate) would be stripped from the land prior to construction

and stored separately. Land restoration would be followed by an aftercare period of generally up to five years, during which the land would be managed to achieve the appropriate level of agricultural productivity.

- 3.1.7 At the EIA stage, agricultural specialists would aim to undertake a detailed survey of the quality of all land affected by the proposed scheme, including land taken temporarily for construction as well as land taken permanently out of production (where possible). We will also consider how construction of the proposed scheme may affect land access, severance and field patterns, drainage schemes and water supplies used for livestock and irrigation.
- 3.1.8 We will seek to reduce potential disruption on farmland from the loss of land, demolition of buildings, severance and loss of access. Owners and operators of affected holdings will be entitled to compensation under existing statutory compensation arrangements. In addition, we will aim to engage with relevant farm owners to understand the impacts the route may have on their holdings and examine steps that can be taken to mitigate these impacts.
- 3.1.9 HS2 Ltd has also published the HS2 Guide for Farmers and Growers¹² for Phase One as a means of achieving more effective engagement with this group. The guide sets out HS2 on agricultural property matters including land acquisition, compensation, land management during construction and land restoration.

3.2 Excavated materials and waste production

Summary of consultation views

- 3.2.1 Comments raised through consultation included concerns that building the route would consume a large quantity of resources. Others mentioned that the material resources estimated for the construction of the proposed scheme were inaccurate. Concerns were also raised in regard to excavation activities causing negative localised impacts during the construction phase, with a handful of people raising concerns over the disposal of excess material and waste.

HS2 Ltd response

- 3.2.2 HS2 Ltd aims to be an exemplar project. The HS2 Ltd Sustainability Policy makes a commitment to source and make efficient use of sustainable materials, minimise the proportion of material diverted from landfill and reduce waste.
- 3.2.3 In accordance with the HS2 Excavated Materials Policy, excavated material will only be classified as waste if it is surplus to the design requirements of the proposed scheme. Where surplus excavated material arises, HS2 Ltd would explore opportunities to make beneficial use of this off-site in environmental improvement projects and other developments (where appropriate) before considering landfill as a last resort.
- 3.2.4 The AoS estimated quantities of excavated material likely to be produced based on preliminary designs in advance of any potential mitigation (environmental mitigation earthworks such as noise bunds alongside the route). This is in line with best practice and is considered appropriate for the strategic-level nature of the AoS. The EIAR will consider the

¹² HS2 Guide for Farmers and Growers, available online at: <https://www.gov.uk/government/publications/hs2-guide-for-farmers-and-growers>

use and management of excavated material in more detail, including the transport of excavated material.

- 3.2.5 The AoS also appraised environmental impacts related to land designated for waste disposal, including active and historic landfill sites. Impacts related to these represent both an environmental risk, in terms of the potential contamination pathways created, and a loss of key municipal services.
- 3.2.6 The general principle for HS2 Ltd would be to balance materials taken from cuttings and tunnelling with those required for embankments and environmental mitigation earthworks. Where surplus excavated material arises, HS2 Ltd would explore opportunities to make beneficial use of this off-site in environmental improvement projects and other developments (where appropriate) before considering landfill as a last resort. Phase One is forecast to re-use 86% of excavated material within the proposed scheme (although this figure is subject to change as the design development is ongoing). Similarly, we would seek to ensure that Phase 2b is able to achieve the highest practicable re-use figure.
- 3.2.7 As set out in the HS2 Waste Management Policy, HS2 Ltd will apply the waste hierarchy (see below) in relation to the reduction and sustainable management of solid waste generated from the design, construction and operation of the proposed scheme. The waste hierarchy places waste prevention as the preferred option at the top of the hierarchy followed by re-use, recycling and other recovery with landfill disposal at the bottom, seen as the last resort.

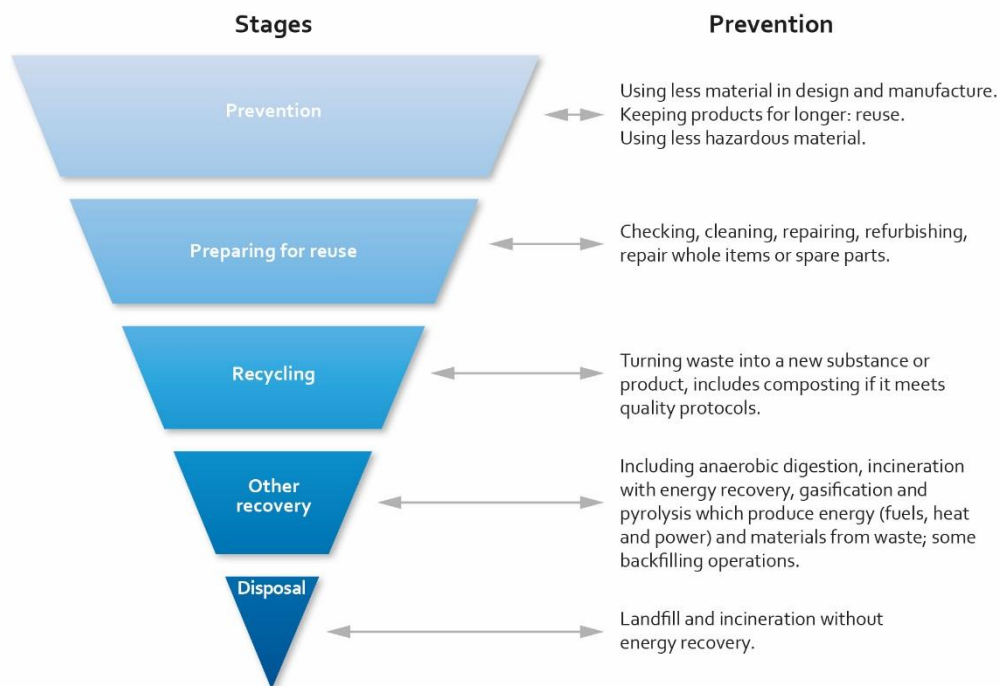


Figure 1 - waste hierarchy

- 3.2.8 HS2 Ltd will seek to avoid impacts on contaminated land, but where it is unavoidable - for example where excavation through landfill is required - HS2 would implement best practice measures to minimise risks to the environment and avoid disposal off-site. These measures would be set out within the CoCP and the LEMPs

4 Natural and cultural resources

4.1 Landscape and visual impacts

Summary of consultation views

- 4.1.1 A number of respondents raised concerns over the impact HS2 may have on the landscape, citing that the route would damage or destroy the countryside. Others noted that the AoS had understated the landscape and visual impacts. Some comments suggested that viaducts would be especially damaging to the landscape and that tunnels ought to have been more widely used to reduce visual impacts.

HS2 Ltd response

- 4.1.2 The AoS has been instrumental in ensuring landscape and visual impacts have been considered throughout the development of Phase Two. This means that, where reasonably practicable, the line of route has been kept deliberately low (as possible) to avoid or reduce landscape and visual impacts.
- 4.1.3 The AoS appraised impacts based on a scheme design without additional mitigation included (e.g. artificial cuttings, earth bunds or landscaped planting to help conceal the railway). With continuing design development, proposals for mitigating impacts will be considered, including possible refinements to the route.
- 4.1.4 HS2 Ltd has produced a Landscape Design Approach (LDA)¹³ which shows the emerging approach to the development of landscape design along the HS2 line of route. The LDA has been produced to guide and direct professionals in the development of all landscape areas, with the aim of achieving an integrated and contextually driven landscape design. The LDA takes into account good practice and has been subject to review by the HS2 Ltd Design Panel.
- 4.1.5 The Government and HS2 Ltd are determined that HS2 builds on Britain's railway engineering heritage, creating impressive stations, viaducts and bridges; and that it should also be sympathetic to the landscape through which it is built. To deliver on that commitment in March 2015, the Government set out the remit for an independent HS2 Design Panel which will be responsible for ensuring design is at the centre of a strategy for making HS2 a world-class railway. The HS2 Design Vision, the first published output of the Design Panel, sets out HS2 Ltd's aspiration for designing the UK's new national high-speed rail network and is based on three core design principles of people, place and time.¹⁴
- 4.1.6 As part of the Phase One hybrid Bill process, a number of information papers have been produced which relate to landscape design, namely, The HS2 Design Policy¹⁵, Green Infrastructure and the Green Corridor,¹⁶ and Maintenance of Landscaped Areas¹⁷. It is likely

¹³ HS2 Landscape Design Approach, available online at:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/550791/HS2_Landscape_Design_Approach_July_2016.pdf

¹⁴ HS2 Design Vision, available online at:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/475052/HS2_Design_Vision_2015.pdf

¹⁵ Information Paper D1: Design Policy, available online at: http://assets.hs2.org.uk/sites/default/files/hb_pdf/D1%20Design%20Policy_o.pdf

¹⁶ Information Paper E11: Green Infrastructure and the Green Corridor, available online at:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/509513/E11_-_Green_Infrastructure_and_the_Green_Corridor_v1.3.pdf

that a similar approach and documentation will be provided for Phase 2b as part of the EIA and hybrid Bill process. In addition, the Draft CoCP for Phase One has stated the general provisions for landscape management. This sets out the appropriate controls to be put in place to help protect the visual amenity in rural and urban areas from construction activities, including designated landscape areas, parks and open spaces and smaller green spaces in urban areas. It is likely that a similar approach will be taken for the CoCP for Phase 2b.

- 4.1.7 At the EIA stage, a landscape and visual impact assessment (LVIA) would be undertaken as part of the EIA; the findings will be detailed in the EIAR and submitted as part of the hybrid Bill that will be scrutinised by Parliament. Further information on the LVIA methodology is contained in the Phase 2a Scope and Methodology Report (SMR)¹⁸. A similar approach would be considered for Phase 2b. Similar to the Phase One EIA, a zone of theoretical visibility (ZTV) may also be produced to assist with determining a study area for the assessment. A ZTV, in accordance with guidance provided by the Landscape Institute, is a computer-generated tool used by specialists to identify the likely (or theoretical) extent of visibility of a development. Therefore, the ZTV would provide an indication of where the proposed scheme could be viewed within a given landscape. This would then inform further stages of design until the project reaches the highest standard possible for protecting the landscape and its amenity.

4.2 Cultural heritage

Summary of consultation views

- 4.2.1 A number of consultation responses raised issues around the impact on heritage assets, including concerns that HS2 may damage or destroy listed buildings. It was also said that the route could pass close to or through heritage sites and local areas of historical significance, which could lead to them being spoiled. Some respondents commented that not enough detail on mitigation was provided for the AoS, with suggestions made that tunnels or cuttings should be used to minimise the impacts.

HS2 Ltd response

- 4.2.2 HS2 Ltd has sought to develop an alignment that would limit impacts upon heritage assets throughout the development of the Phase Two proposals. Potential effects on designated assets – listed buildings, registered parks and gardens, battlefields, scheduled monuments and conservation areas – have been considered throughout as part of the AoS process. This process has included consideration of physical impacts (for example, the removal of archaeological remains due to construction) and the effects upon the settings of heritage asset (for example, on a listed building). Discussions during the AoS process have been undertaken with stakeholders including Historic England and the National Trust to understand their views.
- 4.2.3 Route development has sought to balance a number of factors, such as the impact on communities, business and other environmental aspects. It has also balanced engineering

¹⁷ Information Paper E16: Maintenance of Landscaped Areas, available online at:

[https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/43793/E16 - Maintenance of Landscaped Areas v1.2.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/43793/E16_-_Maintenance_of_Landscaped_Areas_v1.2.pdf)

¹⁸ HS2 Phase Two West Midlands to Crewe: EIA Scope and Methodology Report, available online at:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/506111/HS2_Phase_2a_EIA_Scope_and_Methodology_Report_Final_for_Comms_08-03-2016_WEB_1400.pdf

complexity and cost. It has not been possible to design the route without impacts on heritage assets.

- 4.2.4 As in the Phase One EIA, research during the EIA for Phase 2b will be undertaken to assess known non-designated assets, and evaluation and survey to identify currently unrecorded heritage assets. This research will inform the development of the design, both for further historic environment investigation and proposals for design to reduce the impact in the setting of heritage assets.
- 4.2.5 We are committed to a best practice approach, building on the measures that are being developed for Phase One and similar schemes (e.g. Crossrail, High Speed One (HS1) and highway schemes). Where heritage assets are affected, HS2 Ltd will seek to use the opportunities presented to deepen our understanding of the history of England. This includes, as appropriate, the investigation and recording, preservation in situ and/or the mitigation of the impact on the setting of heritage assets through good design. Engagement with Historic England and local authority archaeologists and conservation officers will be undertaken as part of the EIA, as well as other stakeholders such as the National Trust.

4.3 Biodiversity and wildlife

Summary of views

- 4.3.1 A range of views were expressed on biodiversity and wildlife, including that the route would cause damage to ecological habitats, protected species and biodiversity, and that Sites of Special Scientific Interest (SSSIs) may be put at risk. There were specific concerns related to ancient woodland and national forests, with suggestions that HS2 Ltd would not properly compensate for the loss of these sites. There was concern from some respondents over the use of the mitigation hierarchy, with potential confusion over the terminology used. Concerns were also raised regarding the absence of Local Wildlife Sites in the AoS methodology. A number of responses mention that the initial proposals for HS2 have the potential for delivering biodiversity enhancements.

HS2 Ltd response

- 4.3.2 HS2 Ltd has sought to develop an alignment that would limit the impact on biodiversity and wildlife sites. The HS2 Sustainability Policy makes a commitment to seek no net loss to biodiversity. Through the AoS process, we have sought to balance the need to avoid a range of important environmental features as well as existing communities. This has been balanced alongside engineering complexity, cost and other factors.
- 4.3.3 HS2 Ltd has sought to avoid impacts on internationally designated sites. Where it has been agreed with Natural England that there is potential for significant effects on such sites, we have undertaken assessments as required under the Habitats Regulations, where necessary. For example, a Habitats Regulations Screening Assessment was undertaken for the Manchester Meres and Mosses Special Area of Conservation (SAC). This assessment determined that some route options could result in a 'likely significant effect' on some of the sites that comprise the SAC. By following the screening process and taking the findings into account, an option was chosen that would have no likely significant effect.

- 4.3.4 There was only one SSSI identified as being potentially directly affected by the proposed scheme. Measures to mitigate the impact on this feature will be considered as the scheme develops. Local Wildlife Sites (non-statutory sites of local importance for nature conservation) were not included in the methodology at the AoS stage. This was due to the high-level nature of the AoS and the difficulty in sourcing up-to-date datasets across the entire Phase Two route. As per the Phase One EIA, Local Wildlife Sites will be considered and assessed during the EIA for Phase 2b.
- 4.3.5 Route development seeks to avoid communities and a wide range of environmental features; the outcome is a balance, taking account of all relevant considerations. For this reason it is not practicable to avoid all ancient woodlands. Through the AoS process, we have sought to initially avoid ancient woodlands and where this is not possible, we have sought to reduce the scale of the effect. We recognise that ancient woodland is irreplaceable and we will continue to consider ways in which such loss can be reduced as the design progresses.
- 4.3.6 We are committed to a best practice approach, building on the measures that are being developed for Phase One. This includes use of recovered ancient woodland soils from the affected areas to assist woodland creation in receptor areas that will be identified during the EIA process. Other measures that will be adopted, where appropriate, to enhance woodland creation will include planting native tree and shrub species of local provenance and translocation of coppice stools and dead wood. Opportunities to create links between existing areas of ancient woodland will also be considered.
- 4.3.7 Our approach to mitigation follows the mitigation hierarchy, as set out in the AoS (see figure 2, below) and is consistent with the National Planning Policy Framework and is supported by Natural England. The mitigation hierarchy puts measures in place to 'avoid' any adverse impacts in the first instance. Where ecological impacts cannot be avoided, we would strive to adequately 'reduce', 'abate' and 'repair'. As a last resort, we would aim to 'compensate', ideally at a site connected to where the ecological damage has occurred.

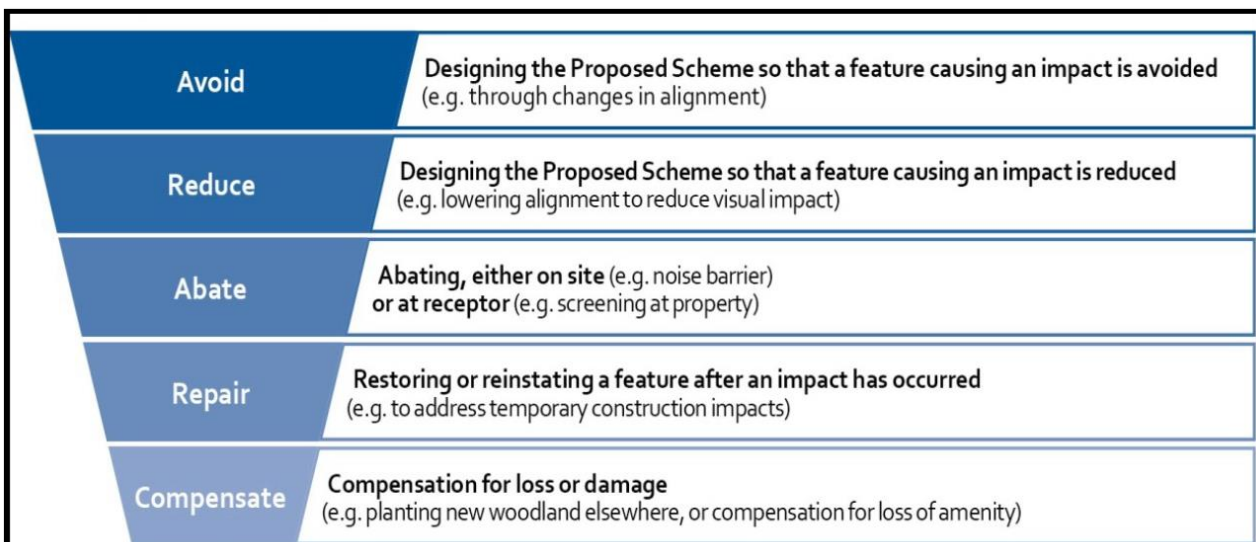


Figure 2 - mitigation hierarchy

4.4 Water resources and flood risk

Summary of views

- 4.4.1 There was concern from some that HS2 would lead to an increased risk of flooding. Other comments suggested that HS2 would be built on areas prone to flooding or on flood plains. A number of concerns were also raised that HS2 would give rise to pollution of watercourses and other waterbodies.

HS2 Ltd response

- 4.4.2 HS2 Ltd is committed to ensuring that our proposals do not put water resources at risk, whether from increased surface or groundwater abstraction, or from contamination. HS2 Ltd has a design aim that there will be no increased risk of flooding on more/highly vulnerable receptors (as defined in the National Planning Policy Guidelines) for the lifetime of the development, taking projected climate change impacts into account. If required, HS2 Ltd would mitigate for the loss of floodplain by creating replacement floodplain storage areas.
- 4.4.3 The AoS used Environment Agency mapping to identify areas of flood risk alongside watercourses with a catchment size of 4km² or more and for smaller catchments with a history of flooding. The AoS also examined impacts on groundwater according to the strategic importance of aquifers, how vulnerable they are to pollution and proximity to major groundwater abstractions (larger than 1,000 m³/day).
- 4.4.4 At the next stage of design, the impacts on surface water, groundwater flows and quality would be assessed and, if required, a strategy to manage potential adverse effects would be agreed with the appropriate regulatory authority, such as the Environment Agency or Lead Local Flood Authority, and where appropriate, statutory water undertakers. The design of the proposed scheme would seek to ensure the protection of controlled waters from pollution.
- 4.4.5 Similar to Phase One, Phase 2b would develop a Draft CoCP which would set out control measures and standards to be implemented throughout the construction of HS2. The Draft Phase One CoCP sets out how the nominated undertaker will require its contractors to manage their site activities and working methods to protect the quality of surface water and groundwater resources from adverse effects and avoid increases in flood risk.
- 4.4.6 As the plans for Phase 2b develop, design opportunities to improve the waterbodies to meet the Water Framework Directive (WFD) objectives will be sought, where reasonably practicable. The WFD is European Union legislation (2000) brought into UK law in 2003 with a requirement on the Government to first assess the chemical and ecological status of waterbodies across the UK and then to prepare River Basin Management plans to achieve good ecological and chemical status for all water bodies. WFD assessments will be undertaken for the proposed scheme, the aim of which will be to ensure that it complies with the requirements of the WFD.
- 4.4.7 At the EIA stage, HS2 Ltd will continue to engage with the Environment Agency, Lead Local Flood Authorities, Internal Drainage Boards, the Canal & River Trust and any other relevant stakeholder, such as water companies, to ensure that significant effects can be managed and mitigated appropriately. We will seek to ensure proposals for permanent structures and temporary works over watercourses, drainage layout, and mitigation plans are designed in the

most suitable way. This will include WFD assessments including local and cumulative impacts, wider ecological appraisal and appropriate mitigation.

5 Communities

5.1 Employment

Summary of views

- 5.1.1 There was a mixed response to this topic, with respondents suggesting that HS2 would have a positive influence on employment and would create opportunities during the construction phase, particularly by bringing employment to the North. However, concerns were also raised that the route would not create enough stable employment or long-term job security, with the majority of the jobs being created during the construction phase. There were also concerns that figures used in the AoS for estimated numbers of jobs supported could not be substantiated. There was concern that the proposals would benefit London at the expense of other city regions. It was noted among some respondents that there would be no benefit to communities along the line of route.

HS2 Ltd response

- 5.1.2 The AoS reported that the full HS2 scheme (Phase One and Phase Two combined) could support up to some 100,300 jobs (including up to 43,600 for Manchester and 26,700 for Leeds). This number is based on the anticipated additional floorspace of commercial and retail development calculated for scenarios both with and without HS2 to determine the net difference. It should be noted that these figures are relatively conservative and it is acknowledged that the actual estimate could be significantly higher. This is because the appraisal cannot predict the extent to which a high speed rail station could itself affect transformation in and around stations by unlocking significant development opportunities providing additional jobs and economic activity. The Core Cities group estimates the total number of jobs supported by the full HS2 route could be as many as 400,000 jobs¹⁹.
- 5.1.3 Estimates of direct employment for Phase Two were reported in the Sustainability Statement. Based on experience of previous large infrastructure projects, it is predicted up to 10,000 jobs would be required at the peak of construction. The operational scheme is expected to require an estimated 1,400 permanent jobs in operations and maintenance activities.
- 5.1.4 HS2 would benefit far more than London alone. There has been much debate about the scale of the potential economic benefits of HS2 and their distribution between North and South. An initial analysis, carried out by KPMG²⁰ on behalf of HS2 Ltd, looked at the potential benefits of HS2 by examining how improvements in connectivity would increase regional competitiveness (London included) and change the future pattern of growth. These effects are expressed in two ways:
- Businesses becoming better connected to one another – businesses are better able to connect with potential suppliers, enabling them to access higher quality and/or lower cost inputs; closer to competitors, with opportunities to learn from each other and

¹⁹ HS2: an engine for growth, available online at: <https://www.gov.uk/government/publications/high-speed-two-an-engine-for-growth/high-speed-two-an-engine-for-growth>

²⁰ 'HS2 Regional Economic Impacts', KPMG (2013) available online at: <http://assets.hs2.org.uk/sites/default/files/inserts/HS2%20Regional%20Economic%20Impacts.pdf>

pressure for increased efficiency; and better able to connect with potential customers, enabling them to supply markets further afield.

- Businesses becoming better connected to labour – individuals are able to access more jobs, whilst businesses are able to draw on a wider and deeper pool of potential workers.

5.1.5 The results from the KPMG analysis suggest that while all regions benefit, the city regions in the Midlands and the North that will host HS2 stations do particularly well. For example, it suggests that in 2037 HS2 could provide a boost to the Birmingham city region equivalent to between 2.1% and 4.2% of its Gross Domestic Product (GDP). For the Manchester city region the figure is 0.8%-1.7%, for the Leeds city region 1.6% and for Greater London 0.5%. This contradicts suggestions that London will benefit from HS2 at the expense of regions in the Midlands and the North. It should be noted that this analysis is a first attempt to tackle the challenging issue of how HS2 will affect the economic geography of the UK.

5.1.6 HS2 Ltd is undertaking a programme of work to understand more fully the mechanisms by which HS2 could increase productivity, and ultimately sustainable economic growth, and how the benefits of HS2 might be spread across the country.

5.2 Property and community integrity

Summary of views

5.2.1 There was unease expressed at the negative effects that the proposed scheme could have on property, with concern that HS2 could lead to a large number of demolitions with further properties rendered uninhabitable due to the proximity to the line of route, depots and stations.

5.2.2 There were a wide range of comments about the perceived negative impact that the route could have on communities, including that HS2 might disrupt, destroy and isolate communities. Others stated that the proposed line of route was already having a negative impact upon communities.

HS2 Ltd response

5.2.3 The AoS considered the physical impacts of HS2 on property in terms of potential demolitions. We have sought to limit the impacts to property and communities by designing the railway to avoid, insofar as possible, existing settlement and communities (residential and commercial).

5.2.4 The AoS also sought to appraise the impact HS2 may have on severance and/or isolation of residential communities. Severance could occur when settlements are divided by the route, leaving some people separated from certain community facilities. Isolation could occur where areas become enclosed between the route and other existing infrastructure (such as motorways or railways) or large linear features, such as rivers. In most cases, wherever roads would be crossed by the proposed scheme or its construction, access would be maintained, where appropriate.

5.2.5 In order to help alleviate some of the concern residents may have over property blight, particularly given the long timescale for developing HS2, the Government has introduced a discretionary Exceptional Hardship Scheme (EHS) for Phase Two. Under the EHS, residential,

agricultural and small business owner-occupiers whose properties may be affected by the construction or operation of the proposed route, and who can demonstrate that they satisfy the criteria of the proposed scheme, are able to apply to have their properties bought by the Government at their full un-blighted value.

- 5.2.6 As Phase One is at a more advanced stage of scheme development, the Government has introduced a range of additional discretionary compensation provisions, on offer to residents affected by the scheme. These include the Express Purchase Scheme, whereby the Government will accept Blight Notices from eligible property owners whose properties are substantially within the safeguarded area, even if it is not yet clear whether the property would actually be needed for the construction or operation of the railway. These provisions are in addition to statutory provisions for people whose property is within the safeguarded zone.
- 5.2.7 Following a route announcement, the Government would introduce a property compensation consultation which would seek the public's views on the measures available to property owners near the route of Phase 2b. At the EIA stage, we will provide further detail on the likely effects of the Phase 2b route on properties and communities potentially affected, and will provide further information on the compensatory provisions likely to be offered to residents affected by the proposed scheme.
- 5.2.8 At the EIA stage, further details will be provided on the types and likely locations of mitigation that will be used to help avoid significant adverse effects on communities, business and the natural, historic and built environment. Mitigation plans will be informed by the EIA process, and detailed in the EIAR, submitted alongside the Bill. This will involve local stakeholders throughout the process.

5.3 Noise and vibration

Summary of views

- 5.3.1 Respondents expressed concern that the railway would cause impacts to residents of nearby properties as well as the local environment. Concerns were raised that the AoS had underestimated the impact that noise would have on the environment. Several respondents believed that there would be a negative impact of noise/vibrations during the construction phase. Some expressed a view that the assumption made by the AoS that a three decibel (dB) reduction in train noise level could be achieved compared with today's high speed trains was not reasonable. There were specific concerns that the impact of vibration in tunnels would lead to significant disturbance.

HS2 Ltd response

- 5.3.2 Noise is a known concern with railways in general and high speed railways are no exception. The Government has a clear noise policy²¹ which commits HS2 to control and manage noise impacts from the construction and operation of the railway.

²¹ Noise Policy Statement for England (NPSE), available online at:
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69533/pb13750-noise-policy.pdf

- 5.3.3 The AoS used a computer-based noise model to predict potential airborne noise impacts on residential dwellings due to noise from the operation of the railway. Construction noise and vibration (including ground-borne noise), and airborne noise at other sensitive locations were described at a commentary level only. The AoS was commensurate with the level of design information available at the time and provided a good indication of where noise impacts might be expected, and what those impacts might be. Following a route announcement, a more detailed assessment will take place as part of the EIA.
- 5.3.4 The AoS predicted potential impacts from the operation of HS2. A more detailed consideration of existing sources of noise could make HS2 less noticeable, which could reduce the potential impacts identified in the Sustainability Statement. This will be considered as part of an EIA, using information obtained from baseline noise surveys.
- 5.3.5 Potential noise and vibration impacts during construction have not been appraised at this stage. Measures to control noise and vibration from construction would be implemented as part of a wider environmental management system, including adherence to measures that will be set out in the CoCP for Phase 2b. The CoCP will set out the provisions that will be adopted to control construction impacts. The construction methodology and phasing will be considered in more detail for the EIA.
- 5.3.6 We believe that the assumption that a 3dB reduction in train noise from advancements in train technology is valid. Trains currently operating on HS1 achieve an exterior noise that is 3dB below the Technical Specifications for Interoperability (TSI) limit at 225 km/h. At higher speeds, existing aerodynamic noise control measures, such as design features developed in Japan for their latest generation of high speed trains, can control exterior noise levels to levels that are 3dB below the TSI limits. In common with all assumptions, the train noise level will be revisited and checked for suitability for the EIA.
- 5.3.7 The potential impacts from vibration and ground-borne noise, particularly in relation to tunnels, is something which will be controlled through the design and maintenance of the trains and track system. Over the past 20 years or so, tunnelled rail schemes have been successfully delivered and now operate with no ground-borne noise or vibration impact or a minimised level of impact.²² In part, this is due to the introduction of the EIA Directive and the associated UK regulations. Experience from HS1 and international guidance suggest that potentially significant effects from ground-borne noise and vibration can be mitigated. With mitigation similar to the resilient track forms developed for HS1, significant ground-borne noise and vibration effects could be avoided; HS2 Ltd is committed to ensuring that no significant residual ground-borne noise or vibration effects arise.
- 5.3.8 At the EIA stage, we would provide a more comprehensive noise assessment, giving a more detailed description of the likely noise impacts and identifying the envisaged mitigation to control significant noise effects, such as noise barriers, earth bunds and noise insulation for buildings.

²² Impacts on Tunnelling in the UK, available online at:
<http://assets.hs2.org.uk/sites/default/files/inserts/Impacts%20of%20tunnels%20in%20the%20UK.pdf>

5.4 Air quality

Summary of views

- 5.4.1 Concerns were expressed during consultation about the impacts the construction of HS2 could have on air quality. There was concern that construction traffic would pose a significant health risk to due to dust and air pollution.

HS2 Ltd response

- 5.4.2 HS2 Ltd will operate efficient, non-polluting (at source) electrically powered trains. However, during construction the potential exists for adverse impacts from associated traffic and site activities.
- 5.4.3 Potential impacts from construction, such as from dust or emissions from construction traffic, were not considered as part of the AoS. This is because the AoS was strategic in scope and did not take into account the impacts from construction. Once a preferred route is announced by Government, construction planning will commence which will allow for the proper assessment of the likely impacts on air quality.
- 5.4.4 Mechanisms to control the potential impacts on air quality would be set out and rigorously applied through the CoCP. The Phase 2b CoCP will contain strategic control measures and standards to be implemented throughout the construction process to control construction impacts.
- 5.4.5 The Phase One EIA concluded that dust and emissions from construction activities will not cause significant effects at any locations along Phase One. This is in part due to the rigorous control measures set out the draft CoCP for Phase One.
- 5.4.6 At the EIA stage, the construction methodology and phasing will be considered in more detail. The CoCP for Phase 2b will evolve so that it can remain responsive to the changing design and to the requirements of stakeholders. Additional local provisions may be made in Local Environmental Management Plans (LEMPs), which would be produced with input from the relevant local authority and statutory bodies.

5.5 Health, well-being and equality

Summary of views

- 5.5.1 A number of respondents stated that the route would have a negative impact on people and local communities. There were also concerns that the route would cause people distress or adversely affect health and well-being. Some respondents stated that the negative effects of the proposed scheme are already hampering the quality of life of those who would live close to the line. Others were concerned that the uncertainty surrounding the proposed scheme is causing stress to individuals and/or impacting on people's ability to plan their future.

HS2 Ltd response

- 5.5.2 The AoS considered, through separate analyses, the potential impacts on health and well-being, and on equality. Consideration of potential health and well-being impacts involved making a qualitative assessment of the potential health effects and vulnerabilities along the route of the proposed scheme. In the absence of a single agreed method, the approach

followed guidance and methods set out by the National Institute of Clinical Excellence and the World Health Organisation as internationally recognised standards.

- 5.5.3 The analysis used local authority and counties 2012 health profiles and drew on mapped Indices of Multiple Deprivation health data along the route. Against this baseline, the health appraisal took AoS conclusions on the potential impacts of noise, visual impact, air quality and employment to identify where these could have secondary implications for health. Potential impacts were validated where possible through recourse to publicly available data on the health impacts of other rail projects, e.g. HS1.
- 5.5.4 A separate Equality Analysis (EqA) was published as part of the Sustainability Statement in July 2013. This analysis provided an initial view on the extent to which people with protected characteristics, as defined by the Equality Act 2010, may be disproportionately or differentially affected by the proposed route. Two updates to the Phase One Equality Impact Assessment (EqIA) were consulted upon in 2015 to take account of design changes to the proposed scheme. HS2 Ltd published a response to these consultations in March 2016.
- 5.5.5 Equality impacts may result from a greater sensitivity to impacts such as changes in access, noise, property demolition, isolation and severance, employment and job displacement, or because people sharing a protected characteristic make up a greater proportion of the affected resident population than their representation in the wider study area. The equality analysis therefore drew on the wider findings of the AoS in order to determine where equality impacts might occur. This includes impacts relating to changes in access to affordable housing, access to community and healthcare facilities, access to faith-related facilities, access to public transport, play space provision, noise impacts on learning, isolation and marginalisation, unemployment, and shortage of accessible housing.
- 5.5.6 An assessment of health impacts will be undertaken as part of the EIAR for Phase 2b. This will consider the potential for impacts on a range of environmental and socio-economic 'health determinants' which would result in adverse or beneficial effects on the health of communities. An EqIA will be submitted alongside the Phase 2b EIAR.

5.6 Access issues

Summary of views

- 5.6.1 There were some comments regarding public rights of way, with a few general comments on the need to make provisions for public footpaths and bridleways and the need to minimise impacts on rights of way. Several local councils argued that all public rights of way should be included in surveys and that HS2 Ltd should discuss impacts on public rights of way with local access forums.

HS2 Ltd response

- 5.6.2 The AoS process involved reviewing the potential crossing of certain public rights of way by the proposed scheme. At this stage, only promoted recreational routes were included.
- 5.6.3 Where practicable, HS2 Ltd would aim to avoid stopping up existing rights of way (not just promoted recreational routes), and maintain access across the railway through the ongoing

design of the scheme. This would involve working with local people, local authorities and relevant organisations to determine the best way of achieving this, where feasible.

- 5.6.4 At the EIA stage, an assessment of impacts on the road and rail networks, including potential changes in local road traffic (especially during construction) and all public rights of way potentially impacted by the scheme will be addressed. Throughout the development of the Phase 2b scheme we will engage with the relevant stakeholders, including local authorities, local interest groups and access forums, to ensure that suitable solutions are found, where reasonably practicable, for potential alterations to access provisions.

5.7 Safety and security

Summary of views

- 5.7.1 There were a few consultation responses received regarding safety and security along the proposed route. Several respondents argued that high speed rail itself is unsafe and there were also concerns, raised by a handful of respondents, that consideration had not been given to how to protect the line from security threats.

HS2 Ltd response

- 5.7.2 HS2 Ltd plans to build a safe network that matches the excellent safety record of other high speed rail systems, such as HS1. This will be achieved by using proven standards and practice, and by running only high speed trains on the line. HS2 will be a dedicated high speed passenger service – it will not transport freight or dangerous goods. We will also aim to prevent accidents by mitigating risks and isolating HS2 from hazards, e.g. locating system equipment away from the line for maintenance activities.
- 5.7.3 Unlike most existing UK railways, HS2 will have no level crossings for vehicles or people; roads and footpaths will go either over or under the railway. Any road bridges going over the railway will be designed so that vehicles cannot fall onto the tracks below. Where railway lines join at junctions, only grade-separated junctions will be provided so that trains do not cross in front of each other when travelling in opposite directions.
- 5.7.4 HS2 Ltd will take steps to prevent unauthorised people and vehicles from accessing the railway. Fencing of various heights will be used along the route. The type of fencing to be used will depend on the risk of trespassing and the specific location. We will monitor the railway boundary, where applicable, using measures such as fibre-optic cabling adjacent to fencing, a technique already being used on other rail networks. This alerts the operator to trespassers and allows action to be taken immediately.

5.8 Traffic and transport

Summary of views

- 5.8.1 There were a number of consultation responses received regarding the impacts on local communities from construction traffic. These comments were made largely in relation to the noise, dust, emissions and congestion that construction traffic would cause.

HS2 Ltd response

- 5.8.2 Traffic and transport was not specifically covered by the AoS as an individual topic. This is because the effects on traffic and transport from the construction and operation of HS2 are dependent on detailed information that is not available at the early strategic stage of the AoS (similar to any other large project considering several hundred potential options). Detailed construction and transport plans are also best undertaken once a scheme is at a more detailed stage of design.
- 5.8.3 At the next stage of design, a Transport Assessment (TA) will be undertaken to consider the potential construction and operation impacts of the preferred scheme as part of the EIA. The TA will examine the potential traffic and transport impacts of the construction and operation of Phase 2b on all relevant modes of transport. In the development of the TA, consideration will be given to appropriate mitigation measures to reduce adverse traffic and transport effects.
- 5.8.4 The TA will subsequently be used to:
- assess and report on the significant traffic and transport effects of the preferred scheme within the EIAR;
 - report the proposals for potential mitigation to address the more significant effects; and
 - report on residual traffic and transport effects.
- 5.8.5 The Phase One Draft CoCP provides details on the requirements of the nominated undertaker to minimise impacts on local communities from construction traffic by its contractors, ensuring that public access is maintained, where reasonably practicable. In accordance with the current draft of the Phase One CoCP, a route-wide Traffic Management Plan (RTMP) has been prepared by HS2 Ltd. The RTMP sets out how the nominated undertaker will manage traffic, transport and highways during the delivery of Phase One. The impact of road-based construction traffic will be managed by identifying clear controls on vehicle types, hours of site operation and routes for large goods vehicles implemented through the development of Local Traffic Management Plans along the route. Construction workforce travel plans will be prepared by the lead contractors with the aim of encouraging the use of sustainable modes of transport to reduce the impact of workforce travel on local residents and businesses. Phase 2b will likely adopt a similar approach; this will be detailed in the Draft CoCP for Phase 2b, which will accompany the hybrid Bill for Phase Two.

6 Conclusion

- 6.1.1 As part of our commitment to be an exemplary project, we have embedded sustainability at each phase of the project. The Phase Two consultation was instrumental in this vision: helping to engage local communities, key stakeholders and the wider public on the proposals for Phase Two.
- 6.1.2 We received a wide range of consultation responses from individuals and organisations in response to the consultation question on the AoS. Whilst a number of responses were supportive of HS2 and our approach to sustainability, many of the responses raise concerns regarding Phase Two, and HS2 more widely, in regard to sustainability. Many of the issues raised will be appropriately addressed during the EIA at the next stage of the project, when a more detailed analysis of the environmental impacts of Phase 2b would be made, together with further route design.
- 6.1.3 An EIA would build on the consultation comments received, and be subject to further stakeholder engagement and consultation with local people and relevant authorities. The EIA (including a health appraisal as part of the EIA), EqIA, and TA will all help inform the design and our understanding of the potential impacts (positive and negative) of Phase 2b. Where the consultation identified useful local information and issues that HS2 Ltd has considered post consultation, this will be used to inform the EIA at the next stage of design, where relevant and appropriate.
- 6.1.4 We maintain that our approach to examining the impacts on the environment and communities through the AoS process remains robust and is appropriate for the purpose it was designed for. The AoS process supported the development and sifting of numerous route options, and considered a wide range of features and increasing levels of detail as the design progressed. The Sustainability Statement (2013), which reported the outputs from the AoS, was a crucial component of the Phase Two consultation. It documented how sustainability has been integral to the development of the proposed scheme and provided a benchmark for the sustainability performance for HS2 Phase Two based on an appraisal appropriate for the level of design.
- 6.1.5 This document provides a response to the issues raised and hopefully helps address concerns by either dealing with them directly or providing reassurance that ongoing design and assessment will provide further detail. Reference to Phase One (which is more advanced than Phase Two) should also provide guidance on what may be expected for Phase 2b.

List of acronyms

ALC	Agricultural Land Classification
AoS	Appraisal of Sustainability
CoCP	Code of Construction Practice
dB	Decibel
EHS	Exceptional Hardship Scheme
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMR	Environmental Minimum Requirements
EqA	Equality Analysis
EqIA	Equality Impact Assessment
ES	Environmental Statement
EU ETS	European Union Emissions Trading System
GDP	Gross Domestic Product
HS1	High Speed One
LDA	Landscape Design Approach
LVIA	Landscape and Visual Impact Assessment
LEMP	Local Environmental Management Plan
RTMP	Route-Wide Traffic Management Plan
SAC	Special Area of Conservation
SMR	Scope and Methodology Report
SSSI	Site of Special Scientific Interest
TA	Transport Assessment
TSI	Technical Specifications for Interoperability
WFD	Water Framework Directive
ZTV	Zone of Theoretical Visibility