

# THE GOVERNMENT RESPONSE TO THE HS<sub>2</sub> DESIGN REFINEMENT CONSULTATION



# **The Government Response to the HS2 Design Refinement Consultation**

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

November 2013

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# 1 Introduction

- 1.0.1 In January 2012 the Government announced the proposed route for HS2 Phase One between London and the West Midlands in the Command Paper *High Speed Rail: Investing in Britain's Future – Decisions and Next Steps*. In May 2013 the *Design Refinement Consultation* (DRC) sought views on 14 changes to that proposed route. The DRC ran from 16 May to 11 July 2013.
- 1.0.2 These 14 design refinements had resulted from HS2 Ltd's ongoing work to develop and refine the design of the Phase One route and from its continued engagement with local communities and others with an interest in the scheme.
- 1.0.3 The Secretary of State is grateful to those organisations and members of the public who responded to the consultation. Some 869 responses were received on the design refinements. An independent analysis of responses to the consultation by Ipsos MORI Ltd is available on-line at [www.hs2.org.uk](http://www.hs2.org.uk).
- 1.0.4 On the 24 October 2013, the Government published the Command Paper: '*The Government Response to the Design Refinement Consultation: Decisions and Safeguarding Directions for Northolt and Bromford*', which set out the Secretary of State's decisions on the design refinements proposed at Northolt and Bromford. The Northolt and Bromford decisions were published earlier in order to complete the safeguarding of land along the whole length of the HS2 Phase One route.
- 1.0.5 This document sets out the Secretary of State's decisions in relation to the remaining 12 design refinements proposed in the DRC.

## 1.1 The Consultation

- 1.1.1 Some consultees felt that insufficient information was provided in the DRC document for them to be able to comment effectively on the proposed design refinements. In describing the 14 design refinements, our aim was to replicate the level of detail in the original consultation on the preferred route for Phase One which took place in 2011, and we believe that the documents provided have achieved that.
- 1.1.2 Some consultees made comments on the local design of the route and its social and environmental impacts, that were not specifically related to the design refinements proposed. Others made comments that related to places some distance from the areas of the design refinements. Although such comments were not generally relevant to the design refinements being consulted on, and as such have not been taken into account in reaching the decisions detailed here, we have considered them in developing the scheme design for the hybrid Bill. They have also been considered in preparing the formal Environmental Statement (ES).
- 1.1.3 As required by Parliamentary Standing Orders, there will be a further opportunity for the public to make comments on the ES following the introduction of the hybrid Bill into Parliament. People directly and specially affected by the hybrid Bill will also have the opportunity to petition Parliament and present their case to a Select Committee of MPs in accordance with the instructions given by the House of Commons at Second Reading.
- 1.1.4 The Secretary of State's decisions on the remaining 12 design refinements are outlined in the following pages.

## 2 Euston Station

- 2.0.1 In the DRC the Secretary of State proposed replacing the January 2012 proposal, which involved rebuilding Euston Station, with a revised proposal. This revised proposal would include shared passenger facilities at the front of the station. 13 of the existing 18 platforms (in the area currently occupied by platforms 1-15) would be kept for conventional rail services while 11 new platforms at a lower level would be built to the west of the current station for high speed services.
- 2.0.2 This section sets out the Secretary of State's decision following consideration of responses to the question:
- "Rather than rebuilding Euston station entirely, the new proposal would provide new shared passenger facilities to the front of the station while retaining 13 platforms, with only minor modification, at their current level on the eastern side of the site, and 11 new platforms for high speed trains on the western side, constructed at a lower level. Please give your views on this proposal, indicating whether or not you support the proposal together with your reasons."*
- 2.0.3 132 respondents answered the question or made comments relating to the proposed design refinement at Euston Station. While some consultees supported the revised station proposal because it was less expensive to construct and could be finished two years sooner than would otherwise be the case, others felt that the revised proposal would reduce the potential for over-station development and so offer less to the community in terms of employment, regeneration and housing. Some consultees argued that the economic value of these extra benefits would outweigh both the additional cost of the original proposal and the greater local disruption during construction due to the longer construction period. Others felt that neither proposal fulfilled the potential of the Euston Area Plan, as neither would sufficiently improve east-west and north-south links through Euston.
- 2.0.4 As set out in the DRC document, we continue to believe that both the January 2012 option and the revised scheme would offer considerable potential for residential, office, retail and other commercial development. The scale of these opportunities is largely dependent on future regeneration plans and the detailed station design. Although opportunities for over-station development might be greater for the January 2012 option because of the greater flexibility of space at ground level and above, there are considerable opportunities with the new design, which HS2 Ltd, Network Rail, the London Borough of Camden and others will continue to develop within the detailed design for Euston. We also believe that the revised scheme will encompass many of the design principles set out in the Euston Area Plan, and enable significant improvements to east-west and north-south access through the station.
- 2.0.5 We believe, moreover, that consultees have not given appropriate weight either to the extra two years of disruption for those living and working locally or to the delay to the start of HS2 services that would result from the January 2012 option. Moreover, the substantially more complex construction programme needed to deliver the January 2012 option involves additional risks that would potentially impact on passengers using the conventional rail services at Euston as well as businesses and residents.

On balance, the Secretary of State's view is that the revised Euston design should be included in the hybrid Bill.

- 2.0.6 Some consultees suggested strategic alternatives to the revised Euston design. These included: terminating the HS2 line at Old Oak Common; the "Euston Cross" proposal put forward by Lord Berkeley and Lord Bradshaw earlier this year; and the adoption of a new 'double deck down' design at Euston which differs from that described in the consultation document.
- 2.0.7 The Secretary of State has already considered and rejected locating the London terminus station at Old Oak Common. This was based on advice from HS2 Ltd in its *Review of HS2 London to West Midlands Route Selection and Speed* report published in January 2012. This was due to the additional journey times for most HS2 passengers travelling to central London, the lack of resilience for HS2 if Crossrail services were disrupted, and the additional land take required to create a terminus station at Old Oak Common. These compelling objections remain and the Secretary of State remains firmly of the view that a London terminus at Old Oak Common is not an acceptable solution.
- 2.0.8 HS2 Ltd has examined the Euston Cross proposal at a high level. From their analysis it is clear that this would be a substantially more expensive proposal – broadly estimated at a net additional cost of £4bn to £6bn. The construction of an underground railway station between Euston and Kings Cross would be technically challenging and add many years to the construction programme. If parts of the new station had to be constructed using an 'open box' method, as HS2 Ltd's engineers believe, then parts of the Somers Town Estate would need to be demolished to make way for the temporary construction works. Such a strategic rethinking of HS2 would require a substantially greater justification in terms of future passenger demand east of Euston than we consider to exist. For these reasons, the Secretary of State is clear that Euston Cross is not a realistic alternative to the revised Euston scheme.
- 2.0.9 A number of consultees asked the Secretary of State to consider a new 'double deck down' proposal put forward by the Pan-Camden Alliance. This type of proposal aims to minimise land take and make the station entirely underground. The consultation document discussed the disadvantages of one specific option of this type that HS2 Ltd had investigated in detail. HS2 Ltd's work showed that there would still be a significant land take, including residential properties on the Regents Park Estate, that the construction period would lengthen by an estimated nine years, that conventional train services would suffer further disruption, and that costs would increase substantially.
- 2.0.10 We have not been provided with a detailed description of the Pan-Camden Alliance's proposal, but any option of this type would need to tackle these same difficult design constraints. There is still a requirement to construct the same number of platforms within and below the existing station footprint and approaches, while keeping the existing train services operational. The depth of the Underground line tunnels at this location limits the depth of the new platforms and the Underground station itself would need largely to be rebuilt. Such a rebuild of the whole station complex above and below ground, whilst maintaining services, would inevitably involve a complicated construction process, building elements in stages. As such, although there would be minor differences between the impacts of different 'double deck down' options, they

are all likely to take substantially longer to construct and cost substantially more than the revised Euston scheme .

- 2.0.11 Some consultees were concerned about the loss of five conventional platforms and the effect this might have on commuter and West Coast Main Line rail services and congestion at Euston. HS2 Ltd are confident that the 13 remaining conventional platforms will be sufficient to cope with the expected demand for conventional services. During the construction phase passengers will inevitably experience some inconvenience as familiar station arrangements are changed. However, we will work with Network Rail and the relevant Train Operating Companies to try to limit impacts as far as reasonably practicable.
- 2.0.12 A range of other issues were raised about the local social and environmental impacts of the revised station proposals, especially during construction. These include such issues as the impacts on local businesses and residents, the re-provision of open space, the re-siting of monuments and memorials, the impact on the Maria Fidelis school during construction, and bus, taxi and cycle facilities. These issues were considered in preparing the ES and are reported in Volume 2.

## **2.1 Conclusion**

- 2.1.1 Having carefully considered the points made by consultees, the Secretary of State has decided to confirm the revised design at Euston station. The revised design meets the operational requirements for the station; delivers the majority of the benefits related to the January 2012 design but with reduced disruption to the local community and passengers without affecting HS2's proposed opening date of 2026; and does so at a lower cost. HS2 Ltd and the Department for Transport (DfT) will continue to work closely with Network Rail and Transport for London to address detailed issues on the design of Euston station and its continued effective operation during construction.

## 3 HS1-HS2 Link

3.0.1 In the DRC the Secretary of State proposed widening approximately 200 metres of the North London Line (NLL) between Kentish Town Road and Hawley Road to allow space for an additional track. This will provide capacity for HS2 services connecting to High Speed One (HS1), which runs from St Pancras to the Channel Tunnel in addition to local passenger and freight services using the line.

3.0.2 This section sets out the Secretary of State's decision following consideration of responses to the question:

*"This proposed change consists of the widening of the North London Line viaduct between Kentish Town Road and Hawley Road to provide capacity for HS2 trains connecting onto HS1 in addition to local passenger and freight services using the line. Please give your views on this proposal, indicating whether or not you support the proposal together with your reasons."*

3.0.3 129 respondents answered the question or made comments relating to the proposed design refinement to the HS1-HS2 link (the Link). Consultees raised a number of issues concerning the Link. These ranged from specific impacts of the viaduct widening and impacts on local residents and businesses during construction, to more strategic concerns about the impacts on rail passenger and freight traffic and the overall justification for the Link.

3.0.4 Some consultees supported the Link on the grounds that a high speed network linking directly with the South East and the Continent would support economic growth and create jobs, while others recognised that the design refinement was an improvement as it would enable existing capacity on the NLL to be maintained.

### 3.1 Hawley Wharf development site and school

3.1.1 Several consultees noted that the widened viaduct was within the area of the proposed Hawley Wharf development, which was granted planning permission by the London Borough of Camden in November 2012. Concerns were expressed about whether that development might be held up or compromised by the HS2 works. Some consultees noted that, if that development was compromised, there could be knock on impacts on Camden Market and on London Underground's aspirations to upgrade Camden Town London Underground station.

3.1.2 The most immediate concern related to the planned construction of the relocated Hawley Infants School (which will be expanding to become a primary school) on a site on the south side of Hawley Road, within the development area, which would back on to the proposed NLL viaduct widening. The school is planning to open in September 2016 and so would be in operation before HS2's construction activity would start. Concerns were expressed over the permanent loss of planned play space at the rear of the school, the potential longer term noise impacts and, particularly, the potential impacts of HS2 construction activity on the operation of the school – for example, in terms of noise, dust, and construction traffic affecting the safety of pupils going to and from the school.

- 3.1.3 We acknowledge that the impact on the new school could have been referred to in the consultation document. HS2 Ltd was, however, aware of the grant of planning permission for the Hawley Wharf development in November 2012 and had contributed evidence to the planning committee.
- 3.1.4 The majority of the construction work to widen the viaduct will be undertaken from land to be occupied by the school, since the HS2 construction site will occupy land identified for the school playground. The works that are required within the school boundary will, so far as reasonably practicable, be undertaken prior to the school opening or during school holidays. This should enable HS2 Ltd to avoid significant impacts on pupils and the operation of the school. For this purpose, HS2 Ltd will work closely with Hawley Primary School and Camden Council, to agree a schedule of works.
- 3.1.5 Once constructed, the widened NLL viaduct will require a narrow strip of land along the southern boundary of the school for the placement of piers to support the viaduct. The school's outdoor play space (including a multi-use games area) would be reconfigured to make use of additional land that will be available after construction activity has been completed. This will enable outdoor play space at the relocated school to be retained.
- 3.1.6 HS2 Ltd is currently in discussions with the developers of the Hawley Wharf scheme to make arrangements enabling both schemes to proceed. HS2's construction works will have no significant effect on the majority of the development area at Hawley Wharf, which lies to the south of the viaduct, and we will work closely with all stakeholders with a view to ensuring that the impacts in the area to the north of the viaduct are manageable.

## 3.2 Impacts during construction

- 3.2.1 Several consultees raised concerns over HS2 construction activity along the route of the Link in Camden Town. Specifically, the need for bridge replacements and construction worksites near to Camden Lock raised concerns over the impact on market trading and the attractiveness of the Market as a tourist destination. A number of residents also expressed concerns about impacts on local traffic from the eight bridge replacements needed for the upgrading of the freight link, Camden Road station and the NLL to the east of Camden Road. We will mitigate effects, for example, by arranging road closures in sequence so that traffic disruption is limited. A detailed assessment of likely traffic impacts in Camden Town during HS2 construction is included in the ES.
- 3.2.2 It is important to bear in mind that increasing volumes of rail traffic on the NLL would imply a need to upgrade or replace at least some of the existing bridges in the area in future years, with or without HS2.
- 3.2.3 A number of local residents specifically objected to the proposed use of Jeffrey's Street for construction traffic. We acknowledge that Jeffrey's Street is not appropriate for construction traffic and have put forward alternative arrangements in the ES.
- 3.2.4 The ES contains details of our proposals for mitigating construction impacts and managing traffic in Camden Town during the HS2 construction period.

### 3.3 Operational concerns

3.3.1 The Secretary of State has noted the operational concerns raised by Network Rail, Transport for London and rail freight groups, but we believe these can be satisfactorily addressed by the enhanced surface option as outlined in the DRC. Some minor enhancements to the conventional network may be needed in future to aid resilience, but we envisage these could be taken forward separately by Network Rail as they relate to an increase in background demand for this infrastructure rather than relating specifically to HS2. HS2 Ltd and DfT are continuing to work closely with Network Rail, with the aim of reaching agreement on these issues and in order to ensure the operational resilience of the NLL. We are also confident that most of the works for HS2 should be capable of being planned in with the normal programme of planned maintenance and renewal on the NLL and so should have limited impact on passengers. Overall, therefore, we consider that passenger services on the NLL will be broadly unaffected during both the construction and operation of HS2.

### 3.4 Strategic concerns

3.4.1 A number of comments were made by consultees on more strategic alternatives to the enhanced surface route. In particular:

- Some consultees felt that the local impacts of the enhanced surface route on traffic, property or businesses would be unacceptable; and that a tunnel option would be preferable. Others, including supporters of HS2, felt that a tunnelled route would be better as it would avoid any impact on NLL passenger and freight services and could be more consistent with the aim of a 'high speed' network linking HS2 and HS1.
- Several consultees, including local authorities in the North and South East of England and in Scotland, quoted recent work by Greengauge 21 which suggests that a more substantial two-track link might be justified by future demand for domestic high speed services.
- Proponents of the Euston Cross proposal suggested the route should continue on in tunnel from Euston and join HS1 near Stratford.
- Others argued in favour of terminating HS2 at Old Oak Common.
- The Mayor of London proposed that the HS1-HS2 link should be deferred to Phase Two of HS2, with only passive provision made at this stage. He argued this would allow further time for the domestic demand issues to be explored and for decisions on the Link to take account of the recommendations of the Airports Commission.

3.4.2 The DRC set out the advantages and disadvantages of the tunnelled options considered. Some consultees have questioned the reference in paragraph 3.4.1 of the DRC to the enhanced surface route involving 'less construction risk' than tunnelled options. As explained in paragraph 3.3.5 of the DRC, the significantly higher construction risks relate to the three shorter tunnelled options which would need to run close to the four London Underground Northern Line tunnels and nearby sewers. The longer northern tunnel option (described in paragraphs 3.3.5 and 3.3.7 of the DRC), would not have a significantly higher construction risk than is usual for tunnelling, but has other disadvantages.

- 3.4.3 Some consultees argued that the discussion of the northern tunnel option in the DRC was not balanced as, in their view, the permanent closure of St Pancras Way south of Agar Grove would have only a limited impact on local traffic. For this reason, they felt that option should be reconsidered as a practical alternative to the enhanced surface route. However, even assuming the permanent road closure was treated as acceptable, the shallow ramp for the northern tunnel (which would come to the surface along St Pancras Way) would involve the loss of around 26 homes and would have significant impacts on other housing close alongside the ramp. Moreover, the option would involve at least one additional vent shaft which would be likely to result in the loss of green open space at Talacre Gardens. So, in addition to the potential impacts on local traffic, there are compelling reasons to reject the northern tunnel option in favour of the enhanced surface route.
- 3.4.4 Greengauge 21 have made a number of valuable points about the possibility of a domestic interchange to Eurostar services at Ebbsfleet, which HS2 Ltd intend to explore further. HS2 Ltd, however, consider that the forecasts of domestic demand produced by Greengauge 21 are overstated. This is partly because Greengauge 21 assume that a connection between Crossrail and the West Coast Main Line will be constructed, allowing onward journeys to Watford and Milton Keynes via Old Oak Common. We also question their modelling assumptions, which appear to imply that westward-bound passengers arriving at Stratford station will generally transfer to the Link. This transfer would involve a 10 minute walk between Stratford station and Stratford International and we believe many will instead find it preferable either to remain on Crossrail or change onto it at Stratford station itself for the high frequency direct services to Old Oak Common.
- 3.4.5 We continue to believe that the Link as proposed would be sufficient to accommodate reasonable predictions of demand, both domestic and international, for the foreseeable future.
- 3.4.6 Alternative proposals to locate the London terminus at Old Oak Common and the Euston Cross proposal are dealt with in the section on Euston Station in paragraph 2.0.7.
- 3.4.7 Analysis by HS2 Ltd shows that deferring the Link until Phase Two would add significant cost to the project. This is the case for each of the surface and tunnelled options that we have evaluated, as the passive provision needed to enable the link to be built in Phase Two would then require a different approach to construction. The new construction site would at that point also disrupt the Camden Town area. Costs would increase partly because the construction site at Chalk Farm would be very constrained in size and inefficient to operate, as well as being costly to purchase from the existing retail owners. In addition, transport of materials to and from the site would need to be predominantly by road.

## 3.5 Conclusion

- 3.5.1 Having carefully considered the points made by consultees, the Secretary of State has decided to confirm the change to widen approximately 200 metres of the NLL between Kentish Town Road and Hawley Road. This will allow for an additional track which will provide capacity for HS2 services connecting onto HS1 in addition to local passenger and freight services using the line.

## 4 Northolt Corridor

- 4.0.1 Details of this decision are provided in the Command Paper "*The Government Response to the Design Refinement Consultation: Decisions and Safeguarding Directions for Northolt and Bromford*" published on 24 October 2013. The Command Paper is available at: <https://www.gov.uk/government/consultations/hs2-design-refinement-consultation>.

## 5 Heathrow Junctions

5.0.1 In the DRC, the Secretary of State proposed that provision be made to enable construction of future connections to Heathrow with the minimum of disruption to HS2 services on the Phase One main line.

5.0.2 This section sets out the Secretary of State's decision following consideration of responses to the question:

*"This proposed change consists of making provision so that a future link to Heathrow can be connected to the Phase One main line with the minimum of disruption to HS2 train services. Please give your views on this proposal, indicating whether or not you support the proposal together with your reasons."*

5.0.3 78 respondents answered the question or made comments relating to the proposed design refinement on building the Heathrow Junctions. The response to this proposal was evenly divided. Some consultees supported it as sensible forward planning to enable a potential future link to Heathrow to be constructed with the minimum of disruption to HS2 Phase One train services; while other consultees questioned the underlying rationale for the link to Heathrow.

5.0.4 Consultees who opposed the design refinement did so for a variety of reasons. Some argued that the demand for travel to Heathrow could be met satisfactorily by passengers interchanging at Old Oak Common; others suggested that the whole line of route should be changed to pass nearer to or under Heathrow. Some felt that the passive provision might not be needed, as government policy on airports was uncertain in advance of the conclusions of the Airports Commission in 2015; others felt that, as no route to Heathrow had been fixed, there was a risk that passive provision for the junctions would be in the wrong place.

5.0.5 As explained in the DRC, the Government decided in 2012 that HS2 should be linked directly to Heathrow. We believe that, despite the pause to the work on the high speed link to Heathrow pending the outcome of the work of the Airports Commission, it would still be prudent to make provision for the junctions so as to avoid disruption to HS2 Phase One services, if and when a link to Heathrow is built. The locations chosen are the only practicable locations for the junctions, as explained in paragraph 5.3.1 of the DRC.

5.0.6 Consultees also expressed a range of broader concerns over environmental impacts in the Colne Valley, both during construction and operation of the railway. These issues are assessed in the ES.

### 5.1 Conclusion

5.1.1 Having carefully considered the points made by consultees, the Secretary of State has decided to confirm the proposed change to make provision for the future connections to Heathrow.

## 6 Colne Valley Viaduct

6.0.1 In the DRC the Secretary of State proposed moving the Colne Valley viaduct up to 60 metres to the north in order to reduce the disturbance to the River Colne.

6.0.2 This section sets out the Secretary of State's decision following consideration of the responses to the question:

*"This proposed change consists of moving the proposed alignment of the Colne Valley viaduct by up to 60 metres to the north to reduce the disturbance to the River Colne. Please give your views on this proposal, indicating whether or not you support the proposal together with your reasons."*

6.0.3 48 respondents answered the question or made comments relating to the proposed design refinement to the Colne Valley viaduct. The Environment Agency and others expressed support for this design refinement, which is aimed at reducing the disturbance to the River Colne.

6.0.4 One specific concern was that moving the viaduct northwards might mean increased noise for the residents of Harefield. However, as set out in noise maps published with the ES, HS2 Ltd's assessment is that Harefield would not be likely to experience a significant effect due to noise under the revised design.

6.0.5 Other consultees commented on the wider impacts of the HS2 route as it passes across the Colne Valley or raised issues which would apply whether or not the design change was implemented. These concerns included the impacts on the local environment, the Site of Special Scientific Interest, and the Green Belt; on local amenities, such as the Hillingdon Outdoor Activity Centre and the Dogs Trust; on Dew's Farm; and on the closure of local roads. There was also general concern over noise from the railway. These issues have been taken into consideration in the ES. We will continue to work with the community and local councils further to mitigate local impacts.

6.0.6 A number of consultees argued in favour of a tunnel under the whole of the Colne Valley, so as to avoid the social and environmental impacts of the proposed scheme on the Colne Valley.

6.0.7 As explained in the ES, the use of a viaduct rather than a tunnel is based on a combination of practical, financial and safety considerations. The lakes in the Colne Valley are large former gravel pits and the ground falls well below water level. This means that tunnelling would be significantly more challenging and expensive than elsewhere on the route. A tunnel would also, in practice, need to be an extension of the Chiltern Tunnel. This longer tunnel would require more extensive provision for fire safety and emergency public evacuation in the event of train failure or fire, such as a third tunnel bore and/or an emergency intervention station in the middle of the extended tunnel length. This would mean a further substantial increase in costs and would have potentially significant adverse environmental effects – such as additional surface infrastructure, a substantial increase in the volume of excavated material and the need to transport it.

## **6.1 Conclusion**

- 6.1.1 Having carefully considered the points made by consultees, the Secretary of State has decided to confirm the proposed change to move the viaduct by up to 60 metres to the north in order to reduce disturbance to the River Colne.

## 7 Maintenance Loop near Stoke Mandeville

- 7.0.1 Since the January 2012 proposals were announced, HS2 Ltd has developed a maintenance strategy for the railway to enable the infrastructure to reliably support HS2 train services. In order to support the efficient running of HS2, the Secretary of State proposed, in the DRC, building a maintenance loop at Stoke Mandeville, approximately half way between the maintenance depot at Calvert and Euston station.
- 7.0.2 This section sets out the Secretary of State's decision following consideration of the responses to the question:
- "This proposed change consists of providing a maintenance loop near Stoke Mandeville in Buckinghamshire to support the efficient operation of the railway. Please give your views on this proposal, indicating whether or not you support the proposal together with your reasons."*
- 7.0.3 90 respondents answered the question or made comments relating to the proposed design refinement to build a maintenance loop at Stoke Mandeville. Support and opposition to the proposed location of a maintenance loop near Stoke Mandeville were roughly evenly divided. Those supporting the proposal generally did so because it would facilitate the efficient operation of the railway.
- 7.0.4 The requirement for a maintenance loop was not generally disputed. On its location, views were mixed, but a number of consultees felt that impacts on the Chilterns Area of Outstanding Natural Beauty (AONB) should be avoided.
- 7.0.5 Concerns were expressed over noise, visual, and light pollution impacts from the maintenance loop. Particular concerns related to the site of the former St Mary's Church and churchyard which would be affected by both the line and maintenance loop. There were also concerns over the relocation of roads and traffic during construction. These issues have been considered in the ES. We will continue to work with the community and local councils further to mitigate local impacts.
- 7.0.6 Some consultees wished to have a clearer idea of how the maintenance loop would be used in practice. HS2 Ltd will provide more information, as the scheme is further developed, on the expected types of usage of the loops and consequent effects on the local area.
- 7.0.7 A number of consultees expressed support for the construction of a road by-pass to the west of Stoke Mandeville which would remove the need to raise the Risborough Road Bridge with its associated embankments. HS2 Ltd has now completed its assessment of this proposal and, following their recommendation, the Secretary of State has included it in the hybrid Bill project.
- 7.0.8 Other strategic alternatives were suggested. These included lowering the alignment of the route and the maintenance loop in the area in order to reduce noise and visual impacts and greater use of tunnelling. In particular, the Chiltern Ridges Action Group (CRAG) put forward its own suggestion for greater use of tunnels under the AONB with the most northern tunnel portal a little to the south of Stoke Mandeville.

- 7.0.9 Work by HS2 Ltd shows that lowering the alignment would substantially increase the amount of excavated material generated and would add to the cost of the project. In addition, if the level of the railway was lowered, watercourses would have to be re-routed to pass underneath the cutting. This would be likely to require the use of siphons, which raises health and safety and maintenance issues. In general, siphons are not considered a satisfactory solution for these reasons. There would also be ecological and potential flood risk issues associated with their use. The Secretary of State has therefore decided not to pursue lowering the alignment in this area.
- 7.0.10 Two proposals from the CRAG, which would involve a greater use of tunnels than in the proposed scheme, have been considered carefully by HS2 Ltd. A detailed analysis is set out in the ES, Central Chilterns Community Forum Area report paragraphs 2.6.8 to 2.6.17. HS2 Ltd assess that the CRAG options would, moreover, involve substantial net additional costs – estimated at over £300m in each case. On balance, after weighing up the environmental benefits and disbenefits, the mitigation measures that could be adopted to reduce the disbenefits, and the additional costs, the Secretary of State considers that the options proposed by the CRAG should not be pursued.

## **7.1 Conclusion**

- 7.1.1 Having carefully considered the points made by consultees, the Secretary of State has decided to confirm the proposal to locate a maintenance loop near Stoke Mandeville. This location is the most operationally efficient and has the least impact on the local environment of the available options. The Secretary of State has also decided to include a new road by-pass to the west of Stoke Mandeville as part of the proposed scheme.

## 8 Calvert Infrastructure Maintenance Depot

- 8.0.1 At the Calvert Infrastructure Maintenance Depot, the Secretary of State proposed in the DRC that an additional east-south 'chord' – a short, curved connecting rail line – be provided to improve access from the proposed Calvert Infrastructure Maintenance Depot (IMD) to HS2 tracks to the south.
- 8.0.2 This section sets out the Secretary of State's decision following consideration of the responses to the question:
- "This proposed change consists of an additional chord to give direct access between the proposed Calvert Infrastructure Maintenance Depot and HS2 tracks to the south. Please give your views on this proposal, indicating whether or not you support the proposal together with your reasons."*
- 8.0.3 57 respondents answered the question or made comments relating to the proposed design refinement to the IMD at Calvert. There was a mix of support and opposition to this design refinement to provide an additional southern access chord for the proposed IMD at Calvert. The support mainly came from those in Twyford, who would benefit from reduced numbers of maintenance train movements nearby, and from supporters of HS2 generally; opposition was mainly associated with those concerned about the environmental and social impacts of the proposed IMD itself.
- 8.0.4 Specific concerns over the change mainly related to the possible demolition of buildings at the Grade II listed Shepherd's Furze Farm. As explained in the DRC, the design of the new chord for the East-West Rail line to Aylesbury could affect both the listed farm and its outbuildings. Network Rail is currently redesigning the East-West Rail line. Based on our understanding of Network Rail's current requirements for this chord, the hybrid Bill project proceeds on the basis that the listed farm and its outbuildings are demolished. We will, however, work closely with Network Rail, as their design is finalised, to explore whether these impacts on the Farm can be reduced or eliminated. One consultee suggested running the two chords closer together. However, the radius of the East-West Rail line chord will depend on the design specification for that railway – so there is a balance to be struck between the efficient operation of the East-West Rail line, its performance for passengers, and its environmental impacts.
- 8.0.5 A range of concerns were expressed about the IMD. These included the noise and visual impacts of a work compound in what is seen as a very quiet area currently. Other concerns were about the risk of flooding, the effect on wildlife, traffic impacts, and that surrounding villages might be cut off from Steeple Claydon, especially during the construction of HS2.
- 8.0.6 These issues have been considered in the ES . We will continue to work with the community and local councils further to mitigate local impacts.

- 8.0.7 Some consultees asked that the IMD be relocated to Fleet Marston or an alternative site. HS2 Ltd provided advice to the Government on the location options for the IMD in its *Review of HS2 London to West Midlands Route Selection and Speed* report published in January 2012. This confirmed their view that Calvert was the best practical option for the IMD and offered the least disruption to communities. The Secretary of State has accepted this advice.

## **8.1 Conclusion**

- 8.1.1 Having carefully considered the points made by consultees, the Secretary of State has decided to confirm the proposed change to introduce an east-south chord for HS2. This will allow direct access between the Calvert IMD and the tracks to the south in order to significantly improve the operation and resilience of the railway.

## 9 Maintenance Loop near Wormleighton

9.0.1 Since the January 2012 proposals were announced, HS2 Ltd has developed a maintenance strategy for the railway to enable the infrastructure to reliably support HS2 train services. In order to support the efficient running of HS2, the Secretary of State proposed, in the DRC, building a maintenance loop at Wormleighton in Warwickshire, approximately half way between the Calvert IMD and Birmingham.

9.0.2 This section sets out the Secretary of State's decision following consideration of the responses to the question:

*"This proposed change consists of providing a maintenance loop near Wormleighton in Warwickshire to support the efficient operation of the railway. Please give your views on this proposal, indicating whether or not you support the proposal together with your reasons."*

9.0.3 48 respondents answered the question or made comments relating to the proposed design refinement to build a maintenance loop at Wormleighton. Most consultees did not challenge the need for the maintenance loop or its location. However, many expressed concerns over potential noise and visual impacts of the loop, particularly at night; the effects on local properties and businesses; the proposed road layout in the area; and possible traffic volumes on local roads and bottlenecks during construction. A number of suggestions were received in respect of potential improvements to the road layout. These issues have been taken into account in the ES. We will continue to work with the community and local councils further to mitigate local impacts.

9.0.4 A large number of consultees wished to have a clearer idea of how the maintenance loop would be used in practice. HS2 Ltd will provide more information, as the scheme is further developed, on the expected types of usage of the loops and consequent effects on the local area.

9.0.5 Some consultees suggested changes to the design of the railway. These included:

- using retaining walls, rather than natural slopes, to narrow the width of the cutting for the maintenance loop and reduce land take;
- lowering the line from Lower Boddington northwards to reduce noise and visual impacts; and
- tunnelling under the area.

9.0.6 In reaching a decision on the recommended route for the railway, it has been necessary to balance operational issues, costs, and social and environmental factors. Although the use of retaining walls could reduce permanent land take, the maintenance loop here will be in cutting some 16 metres below the natural ground level (with the overhead power lines for the trains at some eight metres below ground level). The construction of such high concrete retaining walls would be a costly and major engineering exercise, involving temporary occupation of a wide area. Moreover, for safety reasons, a two metre high wall would be needed to surround the cutting edge. We consider that the use of retaining walls would be more costly than using natural slopes and would not reduce overall environmental impacts on the local area.

- 9.0.7 Lowering the line where it comes to the surface to the north of the maintenance loop would mean the HS2 line having to pass under the Oxford Canal rather than over it. The creation of an aqueduct for the canal would involve greater disruption for users of the canal during construction, and could create water drainage issues for the railway in the longer term. A substantially greater amount of material would also need to be excavated and transported, with a longer construction period and extra cost. Taking into account that use of earth embankments and planting can be used to shield visual impacts in this area, we consider that the adverse impacts would outweigh the relatively small environmental benefits of a lower alignment.
- 9.0.8 Tunnelling under the area would be substantially more expensive and would not be justified by the environmental benefits.
- 9.0.9 One consultee argued that HS2 Ltd's assessment undervalued the landscape impacts at Wormleighton and overvalued them at Radbourne. The Secretary of State does not accept this view. HS2 Ltd has evaluated environmental impacts objectively, in line with the professional standards, as set out in HS2 Ltd's *London to West Midlands EIA Scope and Methodology Report*.

## 9.1 Conclusion

- 9.1.1 Having carefully considered the points made by consultees, the Secretary of State has decided to confirm the proposal for a maintenance loop near Wormleighton. This location is the most operationally efficient and has the least impact on the local environment of the available options.

## 10 Chelmsley Wood Curve

10.0.1 In the DRC, the Secretary of State proposed increasing the height of HS2 over the M42 and Coleshill Heath Road and that the route be moved eastwards so that it is further away from the Chelmsley Wood residential area, playing fields and open space.

10.0.2 This section sets out the Secretary of State's decision following consideration of the responses to the question:

*"This proposed change consists of increasing the height of the railway over the M42 and Coleshill Heath Road and move the route eastwards so that it is further away from the Chelmsley Wood residential area. Please give your views on this proposal, indicating whether or not you support the proposal together with your reasons."*

10.0.3 37 respondents answered the question or made comments relating to the proposed design refinement at Chelmsley Wood. Most consultees supported this change to move the alignment further away from the Chelmsley Wood residential area in order to reduce local noise effects for residents and to reduce the amount of playing fields and open space taken.

10.0.4 Some consultees remained concerned about the effectiveness of visual and sound mitigation measures because of the height of the railway viaduct. Others were concerned at the loss of open space at Heath Park and, specifically, the loss of football pitches. These issues have been considered in the ES. We will continue to work with the community and local councils further to mitigate local impacts and to identify (where reasonably practicable) alternative community facilities to replace those which are lost.

### 10.1 Conclusion

10.1.1 Having carefully considered the points made by consultees, the Secretary of State has decided to confirm the proposed refinements to increase the height of the railway to provide the necessary clearance over the M42 and Coleshill Heath Road and to move the line eastwards by up to 125 metres.

# 11 Water Orton

11.0.1 In order to reduce the visual and sound intrusion for local residents of Water Orton, the Secretary of State proposed a design refinement to move the line of the route in this area southwards by up to 30 metres.

11.0.2 This section sets out the Secretary of State's decision following consideration of the responses to the following question:

*"This proposed change consists of moving the line nearest Water Orton by up to 30 metres southwards in order to reduce visual and sound intrusion for local residents. Please give your views on this proposal, indicating whether or not you support the proposal together with your reasons."*

11.0.3 46 respondents answered the question or made comments relating to the proposed design refinement at Water Orton. There was a mixed response to this proposal with some supporting it, some feeling the change would make little difference, and others feeling the area was already overburdened with road, rail and utility infrastructure.

11.0.4 Some residents commented on issues such as visual and noise impacts, as well as potential negative impacts on road congestion and road safety. The issues raised have been considered in the ES.

11.0.5 Alternative route options were suggested. These included:

- putting the route into tunnel near Water Orton;
- running the line to the north of Water Orton through the sewage farm and brownfield land; and
- running the line through Water Orton using the existing railway alignment.

11.0.6 A tunnel at Water Orton would be very substantially more expensive than the current proposal and HS2 Ltd assess that the extra costs would outweigh the environmental benefits.

11.0.7 An alternative route north of Water Orton following the alignment of the Minworth effluent conduit has been considered by HS2 Ltd. However this would have additional costs of some £180 million compared to the hybrid Bill project. This option has been assessed as not being justified by the environmental benefits for those on the south side of the village, bearing in mind that under this alternative the route would pass closer to residents on the north side of Water Orton.

11.0.8 Some consultees suggested running HS2 through Water Orton along the existing rail corridor. HS2 Ltd considered this in the early stages of the project. HS2 Ltd concluded HS2 would need to pass over the existing rail lines and, given the surrounding topography and water courses, would be largely elevated above the existing ground. This would involve adversely affecting local housing through the centre of Water Orton, the M42 motorway, and the Birmingham to Tamworth and Birmingham to Nuneaton rail corridors. An alternative would be to close Water Orton station and sever the conventional railway. But this would remove an important transport facility for local residents and run counter to the West Midlands Regional Rail Forum's

strategy which aims to provide additional passenger and freight capacity on these corridors to meet increasing demand.

## **11.1 Conclusion**

11.1.1 Having carefully considered the points made by consultees, the Secretary of State has decided to confirm the proposed refinement in order to reduce the visual and sound impacts on the residents of Water Orton.

## 12 Bromford

- 12.0.1 Details of this decision are provided in the Command Paper '*The Government Response to the Design Refinement Consultation: Decisions and Safeguarding Directions for Northolt and Bromford*' published on 24 October 2013. The Command Paper is available at: <https://www.gov.uk/government/consultations/hs2-design-refinement-consultation>.

## 13 Washwood Heath

13.0.1 At Washwood Heath the Secretary of State proposed to improve the rail access to the Washwood Heath depot from the Duddeston flyover to the west of the site in order to ensure the efficient operation of the railway.

13.0.2 This section sets out the Secretary of State's decision following consideration of the responses to the question:

*"This proposed change consists of enhancing access from the west to the Washwood Heath rolling stock depot in order to improve operational flexibility. Please give your views on this proposal, indicating whether or not you support the proposal together with your reasons."*

13.0.3 26 respondents answered the question or made comments relating to the proposed design refinement to improve access to the proposed rolling stock depot at Washwood Heath.

13.0.4 Some concerns were expressed over the impacts on businesses in the Saltley Business Park. Businesses displaced by the project will be entitled to receive compensation for being required to relocate to new premises under existing statutory compensation arrangements. HS2 Ltd will provide appropriate, additional support to help businesses relocate to new premises. HS2 Ltd and DfT will also be working closely with Birmingham City Council on their master planning for the area to ensure that employment opportunities are maximised.

13.0.5 Some consultees suggested that a site for the rolling stock depot near the proposed Birmingham Interchange station would be preferable to Washwood Heath. HS2 Ltd has assessed a range of alternative sites for the depot, including sites near Birmingham Interchange. That assessment, which balanced operational, cost and social and environmental factors, concluded that Washwood Heath remained the best site for the depot.

### 13.1 Conclusion

13.1.1 Having carefully considered the points made by consultees, the Secretary of State has decided to confirm the proposed refinement at Washwood Heath in order to ensure that the railway operates effectively.

## 14 Leeds Junction

14.0.1 In the DRC, the Secretary of State proposed to make provision for a future extension to Leeds so that the new line (subject to securing the necessary Parliamentary approvals) can be connected to the HS2 Phase One line with the minimum of disruption to HS2 train services.

14.0.2 This section sets out the Secretary of State's decision following responses to the question:

*"This proposed change consists of making provision at Curdworth for a future extension to Leeds so that it can be connected to the HS2 Phase One line with the minimum of disruption to HS2 train services. Please give your views on this proposal, indicating whether or not you support the proposal together with your reasons."*

14.0.3 38 respondents answered the question or made comments relating to the proposed design refinement to build the Leeds Junction. The majority of consultees who responded expressed support for making passive provision for the future extension to Leeds in order to minimise future disruption to the railway.

14.0.4 Locally, residents living close to the junction expressed concerns over the social and environmental impacts, especially as they may be affected during the periods of construction for both phases of HS2. Residents of Marston also expressed strong concern over the proposed route for construction traffic through the village and made a number of suggestions for alternative access routes.

14.0.5 To facilitate construction of the railway, the hybrid Bill project incorporates a railhead compound at the Leeds Junction, positioned just to the east of the Phase Two stub and to the north of the Kingsbury Road. The plans for the railhead compound include direct road access to the Kingsbury Road. A more detailed description of the railhead compound, its environmental effects and proposed additional environmental mitigation measures, is included in the ES.

14.0.6 Some consultees were concerned that the listed farm buildings at Dunton Hall would be affected by the route. The hybrid Bill project will, however, protect these buildings, where necessary through the use of retaining walls.

14.0.7 These and other issues raised have been considered in the ES. We will continue to work with the community and local councils further to mitigate local impacts.

14.0.8 Other consultees raised issues not relevant to the decision about the junction – for example, on introducing spurs from HS2 to the Midland Main Line.

### 14.1 Conclusion

14.1.1 Having carefully considered the points made by consultees, the Secretary of State has decided to confirm the proposed refinement to make provision for a future extension to Leeds in order to minimise disruption to HS2 services during the construction of that extension.

## 15 Manchester Junction

- 15.0.1 In the DRC, the Secretary of State proposed a refinement to make provision for a future extension of HS2 to Manchester, so that the new line (subject to securing the necessary Parliamentary approvals) can be connected to the HS2 Phase One line with the minimum of disruption to HS2 train services. The design refinement proposed involved a realignment to a section of the northern end of the HS2 Phase One route.
- 15.0.2 This section sets out the Secretary of State's decision following consideration of the responses to the question:
- "This proposed change consists of realigning the northern end of the Phase One route near Lichfield, and making provision for a future extension to Manchester so that it can be connected to the HS2 Phase One line with the minimum of disruption to HS2 train services. Please give your views on this proposal, indicating whether or not you support the proposal together with your reasons."*
- 15.0.3 56 respondents answered the question or made comments relating to the proposed design refinement to build the Manchester Junction. A range of views were expressed by consultees on the proposed changes. Businesses at Fradley Park were supportive of the change to the route alignment at the business park, with one, Prologis, noting that the changes would allow them to bring forward a development on the site which would deliver over 1,000 new jobs and secure £30-35 million of private sector investment.
- 15.0.4 One suggestion was that the route should be moved to the south west to avoid the Ravenshaw ancient woodlands and also two crossings of the Trent and Mersey canal. While HS2 Ltd has sought to avoid impacts on ancient woodland where reasonably practicable, in this case the technical constraints on route design have meant an unavoidable impact. After crossing the A38 near Streethay, a straight section of route is needed for the spur junction and this takes the route too far north to curve back south of the woodland before joining the West Coast Mainline at Handsacre. Going north of the woods, which would still involve the canal crossings, would also be impractical as it would involve too tight a final curve to reach the junction at Handsacre.
- 15.0.5 One consultee suggested relocating the canal to run on the north side of the Phase One main line, in order to avoid the double crossing. However this was not supported by canal groups who felt the heritage value of the existing canal lock and buildings would be adversely affected.
- 15.0.6 A number of residents of Streethay suggested that a tunnel passing under the A38 and South Staffordshire Railway would be preferable in order to reduce sound and visual impacts on Streethay. However, no new evidence in favour of this change was presented. The Secretary of State's view remains, as explained in paragraph 15.3.2 of the DRC, that the option would be excessively expensive in relation to the limited environmental benefit which would be gained.

- 15.0.7 A number of consultees raised concerns about the environmental and social impacts on the route on woodland, biodiversity and specific impacts on farmland and local access roads especially during construction. These issues have been considered in the ES. We will continue to work with the community and local councils further to mitigate local impacts.
- 15.0.8 Other consultees mentioned a range of issues not relevant to the consultation. The issues were considered during the 2011 consultation and are only noted for information here.
- 15.0.9 Suggestions included that:
- the HS2 Phase One route should terminate at Birmingham, without a link to the West Coast Main Line;
  - the HS2 Phase One link with the West Coast Main Line should be moved further north to avoid a busy section of that line; and
  - a request for a green or bored tunnel through the Whittington Heath golf course to the south east of Streethay.

## **15.1** **15.1 Conclusion**

- 15.1.1 Having carefully considered the points made by consultees, the Secretary of State has decided to confirm the proposed refinement to make provision for a future extension to Manchester. This would reduce the impact of the line on existing and proposed commercial developments and minimise disruption to HS2 services during the construction of the proposed extension to Manchester.

## 16 Next steps

- 16.o.1 The 14 design refinements have been incorporated into the hybrid Bill project and assessed in the ES.
- 16.o.2 There will be further opportunity for members of the public to make comments on the ES following the introduction of the hybrid Bill into Parliament. Public participation on the ES will open on 25th of November 2013 and close on 24th of January 2014. The consultation will be available here [https://www.gov.uk/government/publications?publication\\_filter\\_option=consultations](https://www.gov.uk/government/publications?publication_filter_option=consultations)
- 16.o.3 People directly and specially affected by the hybrid Bill will also have the opportunity to petition Parliament and present their case to a Select Committee of MPs in accordance with the instructions given by the House of Commons at Second Reading. More details about how to petition are available on the Parliament website via the following link: <http://www.parliament.uk/business/bills-and-legislation/current-bills/previous-bills/hybrid-bills/>



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