



Department  
for Transport

# HS2

## High Speed Two: Phase 2b Design Refinement Consultation

**Moving Britain Ahead**



# High Speed Two: Phase 2b Design Refinement Consultation

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

June 2019



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# Foreword



High Speed Two (HS2) will be transformative for the UK, adding much needed capacity to our rail network, connecting some of our biggest cities and towns and acting as a catalyst for economic growth. The project is divided into three phases and the progress we are making on Phase One, which runs from London to Birmingham, has created 9,000 jobs and 320 apprenticeships, with 2,000 businesses working on building what will be the backbone of Britain's rail network.

This consultation marks another major milestone for HS2. I am today asking for your views on a set of proposed refinements to the HS2 Phase 2b route from Crewe to Manchester and West Midlands to Leeds. The proposed changes to the HS2 route are intended to make it more efficient, cost effective and to minimise disruption for residents and impacts on the environment.

Today's consultation also marks the first step towards fully integrating HS2 and Northern Powerhouse Rail (NPR), a major rail programme which will improve connectivity across the north and is a key element of the Government's Northern Powerhouse Strategy. NPR is being developed in close co-ordination with HS2, and is intended to make use of HS2 lines where that makes sense.

This consultation includes proposals for infrastructure that would one day allow Northern Powerhouse Rail (NPR) trains to use the HS2 route and vice versa. I am seeking views on plans to allow for two future junctions that could see the HS2 line into Manchester also be used as part of NPR. These proposals have been developed in partnership with Transport for the North, and, in the future, would allow for a potential new route between Manchester and Liverpool which could also be used for services between London and Liverpool.

Further scope to support the interfaces with NPR (including at Leeds) and Midlands Connect is currently being considered and is subject to future funding decisions. This consultation also considers some works on the existing rail network that will allow for HS2 trains to run between the south and our great northern cities. Design work on the scheme continues and where further change is needed I would expect to consult.

Engagement with affected communities is at the heart of our plans, so it is only right that we once again seek the views of those who will be affected. Your response to this consultation will be central to the design of the railway as it develops.

HS2 will be transformational. It will increase capacity on our congested railways and improve connections between our biggest cities and regions. It will support our Industrial Strategy, create jobs and is critical to this Government's plans to rebalance our economy. It provides the foundations on which NPR can build.

I look forward to hearing your views on the proposed refinements in this consultation. They are a critical part of our plans to develop the HS2 network alongside plans for NPR, and another important step in making HS2 and its benefits a reality.

A handwritten signature in black ink, appearing to read 'Chris Grayling', with a long horizontal flourish extending to the right.

**The Rt Hon Chris Grayling MP**  
Secretary of State for Transport

# 1. Introduction

## Background

- 1.1 Investment in transport infrastructure is a key part of the Government's Industrial Strategy to boost economic growth. Modernising our rail network beyond what can be achieved on the existing network by delivering additional capacity and enhanced connectivity will allow for more services to more destinations so that businesses can grow, work together and access a wide range of customers, suppliers and skilled labour markets.
- 1.2 High Speed Two (HS2) is a new high-speed railway proposed by the Government to connect major cities in Britain. It will be the new backbone for our national integrated transport network, increasing capacity, improving connectivity and reducing journey times.
- 1.3 HS2 will increase capacity to Manchester and Leeds and transform journey times from London and Birmingham to Manchester, Sheffield, Leeds, Scotland, Newcastle, Liverpool and Preston, and between the northern cities and the Midlands. It will directly connect eight of our ten largest cities and their regions, with significant reductions in journey times. HS2 will connect people to jobs, businesses to suppliers, and make parts of the UK more accessible to leisure travellers and tourists.
- 1.4 HS2 will be built in phases, detailed below.

## Phase One

- 1.5 Phase One of HS2 will see a new high-speed line constructed from London to the West Midlands, where it will connect to the existing West Coast Main Line (WCML). The High Speed Rail (London – West Midlands) Act 2017 gives Government the powers to construct, operate and maintain the railway within a set of geographical and environmental limits. Early works are underway at sites including major development at Curzon Street, Euston and Old Oak Common.

## Phase Two

- 1.6 Phase Two extends the line to the north-west and north-east: to Manchester with connections to the WCML at Crewe and south of Wigan; and to Leeds with a connection to the East Coast Main Line (ECML) approaching York, completing what is known as the full "Y" shaped network and unlocking the full benefits of HS2. Phase Two is split into Phase 2a and Phase 2b.



## Phase 2a

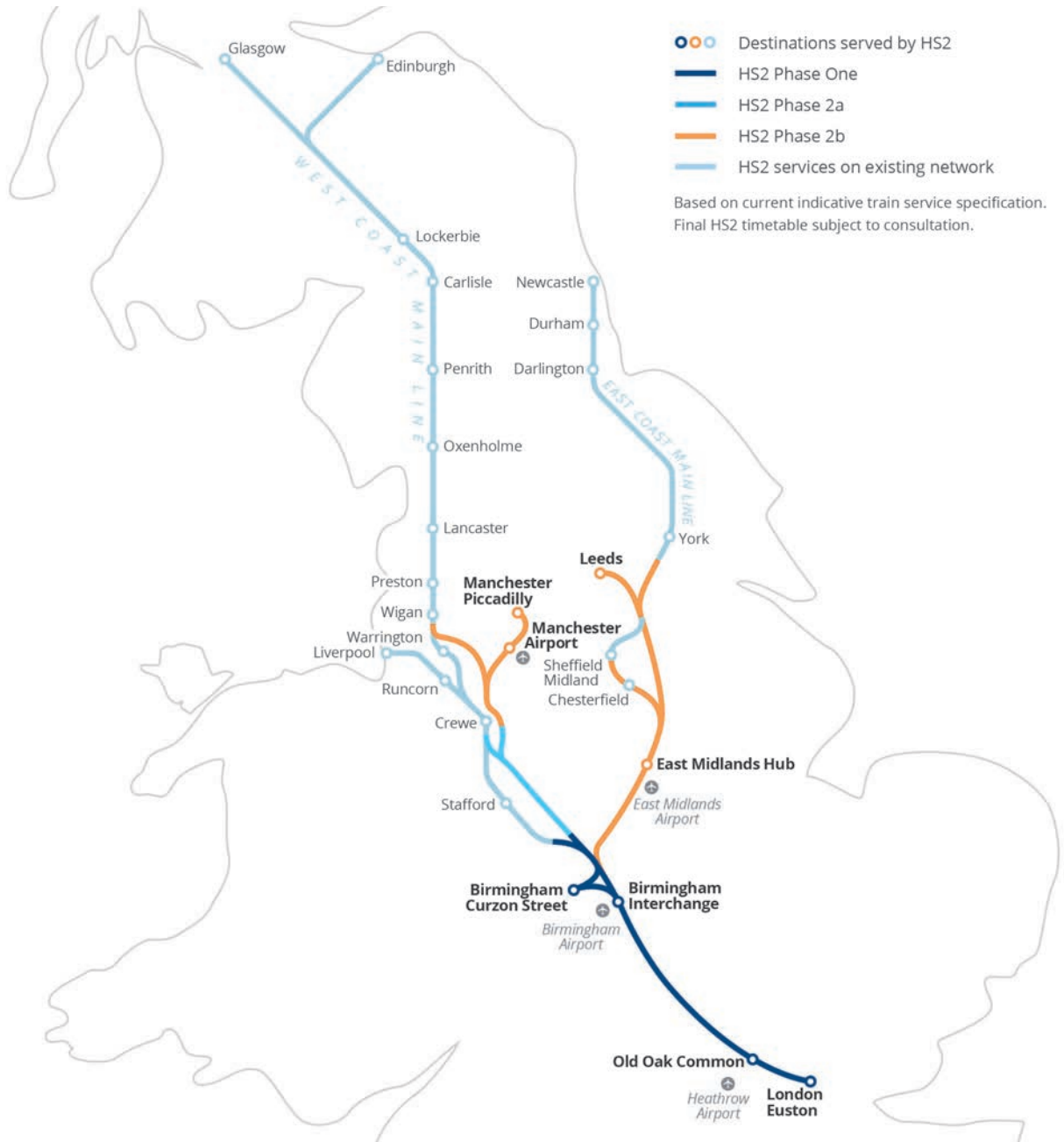
- 1.7 We have accelerated Phase 2a to extend HS2 from the West Midlands to Crewe, bringing the benefits of HS2 connectivity to northern cities six years sooner than was originally planned. This means that passengers, communities and cities across the North West and Scotland will see more of the economic benefits of HS2 sooner.
- 1.8 The High-Speed Rail (West Midlands – Crewe) Bill is currently in Parliament and Royal Assent, subject to successful completion of the Parliamentary process, is expected at the end of 2019.

## Phase 2b

- 1.9 The Government confirmed its preferred route for Phase 2b of HS2 in the July 2017 command paper “High Speed Two: From Concept to Reality”.<sup>1</sup> Phase 2b is the next stage of HS2, completing the full “Y” network and realising the capacity and connectivity of HS2 in the north and midlands of England. Phase 2b comprises two parts, the eastern and western leg. The eastern Leg runs from the West Midlands to Leeds with connections to the Midland Main Line and ECML. The western Leg runs from Crewe to Manchester and will also join the WCML.
- 1.10 New infrastructure of this scale will have significant impacts on the communities it affects. Engaging as early as possible on proposed changes to the route is vital so that people understand how the railway will affect them and can have the opportunity to suggest how any impacts might be avoided, reduced or mitigated.
- 1.11 In early summer 2018 HS2 Ltd released updated information for affected communities, which included the locations of some of the power supply systems, changes to public rights of way, construction compounds and significant roads realignments. This early engagement sought to bring greater certainty for communities along the route as well as to prepare them for further formal consultations.
- 1.12 In autumn 2018, the Government launched a consultation on the Working Draft Environmental Statement (WDES), this is the detailed part of the hybrid Bill process which sets out the likely significant effects of building and operating the railway as well as proposed ways to mitigate these effects and monitor performance. This included construction traffic routes and the area of land needed to construct the railway, much of which may not be required once the railway is completed. The Working Draft Equality Impact Assessment (WDEQIA) was also consulted on during this time. The assessment considers the potential effects of constructing and operating Phase 2b on groups of people because of their age, disability, gender, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion, belief, sex and sexual orientation.

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<sup>1</sup> Department for Transport, 2017, High Speed Two: From Concept to Reality [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/629380/high-speed-two-from-concept-to-reality.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/629380/high-speed-two-from-concept-to-reality.pdf)



**Figure 1: Plan of the HS2 network**

- 1.13 Today, HS2 Ltd have published two independent reports produced by Ipsos MORI which summarise the feedback received for the WDES and WDEQIA consultations. The Government expects to provide formal responses to each of the consultations in due course.
- 1.14 Regular and early public engagement in the evolving Phase 2b design demonstrates the Government's commitment to residents and businesses, economies in the north and midlands, and enables preparations for the Phase 2b hybrid Bill.

## Refinement of the Phase 2b route

- 1.15 HS2 Ltd will continue to refine the Phase 2b route design for the HS2 Phase 2b hybrid Bill. This refining process will carry on right up until the point construction begins. This is typical of any major infrastructure project and seeks to ensure that Phase 2b is as efficient, cost effective and environmentally sensitive as it can be.
- 1.16 Where potential changes are identified during the ongoing refinement process, HS2 Ltd follows a procedure of design development appraisal set out in their Route Development Procedure (RDP). This ensures that there is a structured and evidence-based approach applied when evaluating proposed changes across HS2. The procedure balances considerations of cost, environmental and community impacts, constructability, business case performance and safety.
- 1.17 As part of this ongoing refinement, engineers and environmental specialists have been able to identify areas of the route where changes, or additional infrastructure may be needed to realise the best options for building and operating the railway. The proposed changes which make up this consultation are set out in Chapter 2 and have been developed using HS2 Ltd's RDP. This consultation provides the opportunity for people to provide their feedback on these proposed changes and allows the Secretary of State to consider the views of interested parties and the public at large before making a decision on whether the changes should be included in the Phase 2b hybrid Bill scheme.
- 1.18 The 2018 WDES, WDEQIA and information gathered from continuous engagement contribute to important route refinement work and will inform the Phase 2b Environmental Statement (ES) and Equality Impact Assessment (EQIA).
- 1.19 The Secretary of State is therefore consulting on 11 proposed design refinements. This HS2 Phase 2b Design Refinement Consultation (DRC) is a key milestone on the path leading up to hybrid Bill deposit. The proposed changes in this DRC can be categorised into three groups:
- **Relocations and realignments:** where sections of the route have undergone further development work. Such work may include newly discovered efficiencies, or solutions to issues which differ significantly from the design that was previously consulted on.
  - **New infrastructure:** pieces of new infrastructure that are required for the construction of HS2 and to facilitate the maintenance and stabling of trains.
  - **New scope:** the HS2 route design is proposed to include infrastructure designed to ensure HS2 can accommodate future potential Northern Powerhouse Rail (NPR) services. The first elements of this scope are included in the consultation while design work in other areas continues.

- 1.20 As explained above, HS2 Ltd will continue to refine the design of the railway in accordance with their RDP as well as taking into consideration the views expressed in response to this, and any subsequent, consultations. This will include the formal Phase 2b ES and EQIA that will be consulted on alongside the deposit of the hybrid Bill.

## Northern Powerhouse Rail

- 1.21 The Government is working in partnership with Transport for the North (TfN) on the NPR programme, which is designed to transform connectivity and capacity between the key economic centres of the north.
- 1.22 TfN is the first statutory sub-national transport body bringing together 20 local transport authorities to enable the north to speak with one voice on the transport infrastructure investment needed to drive transformational growth and rebalance the UK economy. The Government is working in partnership with TfN, Network Rail, HS2 Ltd and others to deliver the Government's vision to transform the economy of the north of England. This includes improving connectivity between major cities in the north and improving the capacity, frequency and journey time of rail links between the region's main economic centres.
- 1.23 In October 2017 the Government committed £300m to integrate NPR and HS2, thereby reducing the amount of infrastructure required to deliver the NPR network and avoiding disruption to HS2 in the future. Following technical design work, we are now consulting on two of these interface points. These are in line with TfN's proposals for NPR and are included in TfN's Strategic Transport Plan<sup>2</sup> which was formally adopted by TfN in February 2019.

## Northern Powerhouse Rail and the Design Refinement Consultation

- 1.24 The Government has been working with TfN and HS2 Ltd to integrate the designs for a series of "touchpoints", which are pieces of infrastructure to enable future connections between NPR and HS2 to future-proof the Phase 2b route for NPR. In the 2017 Budget, the Chancellor granted additional funding to ensure HS2 infrastructure can be built to accommodate future NPR and Midlands Connect services.
- 1.25 The Secretary of State has decided to consult on the provision of two touchpoints for NPR within this consultation. These will facilitate future junctions that could connect to a potential new line from HS2 towards Liverpool. One junction would allow future Liverpool-Manchester NPR trains to use the HS2 line into Manchester; the other would allow future London-Liverpool HS2 trains to use any new, future NPR route into Liverpool. This would enable improved capacity and connectivity between Liverpool, Warrington and Manchester Piccadilly whilst significantly reducing journey times between Liverpool and Manchester Airport, and a faster route between Liverpool, Warrington and London.

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2 Transport for the North: Strategic Transport Plan, draft for public consultation  
<https://transportfornorth.com/onenorth/>

- 1.26 This consultation presents the first iteration of the designs for the passive provision for these NPR junctions. Passive provision refers to the minimum level of additional works required to avoid disruption to the operation of HS2 when the junction is fully built after HS2 is operational. At these locations, this generally involves the provision of civil engineering and earthworks within a distance of 500m of HS2. As the passive provision for these junctions are being delivered under the Phase 2b hybrid Bill, they have been designed to HS2 Ltd's technical specifications and their construction will be in accordance with the same environmental controls and policies as the rest of the HS2 construction phase. For instance, the Code of Construction Practice will apply. The Environmental Statement that accompanies the hybrid Bill will include an assessment of the likely significant effects associated with the construction of these touchpoints. Any measures necessary to mitigate these impacts will be included in the Phase 2b hybrid Bill.
- 1.27 Whilst the Government is yet to make decisions on the NPR routes that would connect to these junctions, it is necessary to make changes to the design of Phase 2b for the hybrid Bill to avoid precluding, or making it very expensive for, NPR routes to join HS2 in future and delivering the benefits that NPR will bring to the UK economy. The designs for these junctions are intended to allow subsequent choices on the NPR network.
- 1.28 The NPR route to connect these junctions with Liverpool will be considered as part of a separate planning, assessment and consenting process. If the Government chooses to proceed with these routes, which are subject to affordability and business case assessment, this process would include further environmental assessment and consultation, enabling the public to have their say on the emerging designs.
- 1.29 The designs for London-Liverpool and Liverpool-Manchester junctions are being shown now to provide the earliest possible opportunity for the public to provide their feedback on the proposed inclusion of passive provision for these junctions in the Phase 2b hybrid Bill.
- 1.30 Along with the proposed passive provision for the two NPR junctions on which we are consulting there are a range of further touchpoints that are being considered to future-proof the HS2 network to connect to potential future NPR services including around Leeds as part of the Strategic Outline Business Case (SOBC). The SOBC is currently being assessed by the Government to ensure we identify the best value for money routes which promote the greatest economic growth across the north. A connection from HS2 to support Midlands Connect's aspirations is also being assessed.
- 1.31 Details of the proposed changes to facilitate NPR are detailed within Chapter 2.

## Land and property: support to affected property owners

- 1.32 Some of the proposed changes set out in this consultation mean HS2 will require more land to build and operate the railway. The impacts on properties resulting from these changes are detailed in the relevant sections of the following chapter. The Government recognises the difficulties these proposed changes will have on people who were previously unaffected, and is committed to reducing and mitigating impacts wherever possible as well as engaging regularly and closely with all affected parties.
- 1.33 We know that proposals for new infrastructure can create uncertainty within the property market, which is why the Government has established a package of non-statutory schemes to support affected property owners. These schemes already apply to the Phase 2b route<sup>3</sup>, and affected homeowners and small businesses may apply for them until a year after the railway is open to the public.
- 1.34 The Need to Sell scheme enables property owners along the HS2 route, who meet the scheme's qualifying criteria, to apply to sell their home to the Government if they have a compelling reason to do so. This scheme is being made available on an interim basis to owners of properties affected by the proposed NPR junction locations on which we are consulting, subject to engagement with local residents who are affected by these proposals. In the light of that engagement we will consider whether any different property support and compensation package is needed in the period until future NPR routes are confirmed.
- 1.35 More information on HS2 property compensation schemes is available at: <https://www.gov.uk/claim-compensation-if-affected-by-hs2>

## Safeguarding

- 1.36 Safeguarding is primarily a planning tool to help protect the land needed for the HS2 scheme from potential conflicting development. Safeguarding is reviewed throughout the project and is updated periodically to reflect new land requirements.
- 1.37 Safeguarding land enables the Government to consider potential future planning developments which could otherwise conflict with our plans. Eligible owners of properties that are within an area which is subject to 'surface safeguarding' (i.e. where the route runs on the surface rather than within a deep bored tunnel) have the right to sell their property to the Secretary of State and receive statutory compensation.
- 1.38 Land that has been included in the latest update to safeguarding broadly reflects the extent of the autumn 2018 WDES. Land that was previously identified within the WDES but is no longer expected to be needed because of the route design changes have not been safeguarded.

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3 HS2 Ltd, Guide to HS2 Property Schemes, Phase 2b [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/629740/hs2\\_phase\\_2b\\_property\\_schemes\\_guidance.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/629740/hs2_phase_2b_property_schemes_guidance.pdf)

- 1.39 We expect to update safeguarding again for the Phase 2b route prior to the deposit of the hybrid Bill to reflect the latest design of the route. More information on safeguarding is available at: <https://www.gov.uk/government/collections/safeguarding-information-and-maps-for-hs2>



## 2. Proposed design refinements and next steps

### Introduction to the consultation

- 2.1 The HS2 Phase 2b June 2019 Design Refinement Consultation (DRC) will run from 6 June 2019 until 11:45pm on 6 September 2019.
- 2.2 This part of the document provides details of the proposed changes that the Secretary of State is minded to include in the design that is submitted to Parliament as part of the Phase 2b hybrid Bill.
- 2.3 The proposed changes have been divided into three categories:
  - relocations and realignments;
  - new infrastructure; and
  - new scope
- 2.4 Following the summary, each proposed change is then described in further detail on pages 19 to 66 and detailed plans for each proposed change can be found in Volume 2 of the DRC.
- 2.5 How you can respond to this consultation is explained in full in Chapter 3 on page 67 in this document.
- 2.6 All of the information contained in this document can also be found online at: [www.hs2.org.uk/phase2b](http://www.hs2.org.uk/phase2b). Copies of this consultation document and the associated response form can also be obtained via the HS2 Helpdesk, the details of which are at the end of this document.



## Summary of each of the proposed design refinements

	Proposed design refinement	Description of proposed change
Relocations and realignments		
1	Relocation of the Palatine Road vent shaft, West Didsbury, Manchester	The Secretary of State is minded to relocate the vent shaft for the Manchester tunnel to an alternative site within Withington Golf Course to reduce the impact on flood storage capacity in the area.
2	Relocation of the Lytham Road vent shaft to Birchfields Road, Fallowfield, Manchester	The Secretary of State is minded to relocate the vent shaft for the Manchester tunnel from the playing fields of Manchester Enterprise Academy on Lytham Road to the car park of Fallowfield Retail Park on Birchfields Road.
3	Realignment of the route at junction 10 of the M42, North Warwickshire	The Secretary of State is minded to replace the currently proposed cut and cover tunnel under junction 10 of the M42 with a bored tunnel to reduce impacts on the junction. This change requires a minor realignment of the route through Kingsbury Water Park.
4	Realignment of the route between Ashby-de-la-Zouch and Diseworth, Leicestershire	The Secretary of State is minded to realign approximately 13km of the current route by a maximum of 170m to the east between Ashby-de-la-Zouch and Diseworth. This is to reduce impacts associated with crossing former open-cast mines and historic landfills in the area between Ashby-de-la-Zouch and Diseworth.
5	Realignment of the route at Trowell, Nottinghamshire	The Secretary of State is minded to realign the proposed route as it passes Trowell to avoid the need to permanently realign the M1.
6	Leeds corridor, Woodlesford to Leeds station	The Secretary of State is minded to change the height of the route for 8km on the approach into Leeds station so the line runs predominantly on a viaduct, rather than a combination of at ground level, cutting and embankment.

	Proposed design refinement	Description of proposed change
<b>New infrastructure</b>		
7	Temporary construction railhead and permanent maintenance facility at Ashley, Cheshire	The Secretary of State is minded to introduce two pieces of new infrastructure near Ashley. One is a temporary railhead south of the route to support construction of the new railway. The second is a permanent infrastructure maintenance base – rail (IMB-R), for storage of overnight maintenance trains, at a separate site to the west of Ashley.
8	Permanent maintenance facility at Austrey, North Warwickshire	The Secretary of State is minded to introduce a permanent infrastructure maintenance base for rail – (IMB-R) near Austrey in North Warwickshire.
9	Temporary construction railhead at Ashby-de-la-Zouch, Leicestershire	The Secretary of State is minded to introduce a temporary construction railhead near junction 13 of the A42 and the existing Leicester to Burton upon Trent rail line, to support the construction of the new railway.
10	Permanent train stabling facility at Heaton, Newcastle-upon-Tyne	The Secretary of State is minded to include a stabling facility within an existing railway depot at Heaton, near Newcastle-upon-Tyne, to store high speed trains serving the north.
<b>New scope</b>		
11	Passive provision for two junctions at High Legh, Cheshire	The Secretary of State is minded to include passive provision for two junctions to enable future use of the HS2 line into Manchester for potential NPR services between Manchester, Warrington and Liverpool; and a second to also allow HS2 services between London and Liverpool to use future NPR infrastructure.

**Table 1: Summary of each of the proposed design refinements**

## Locations of proposed design refinements

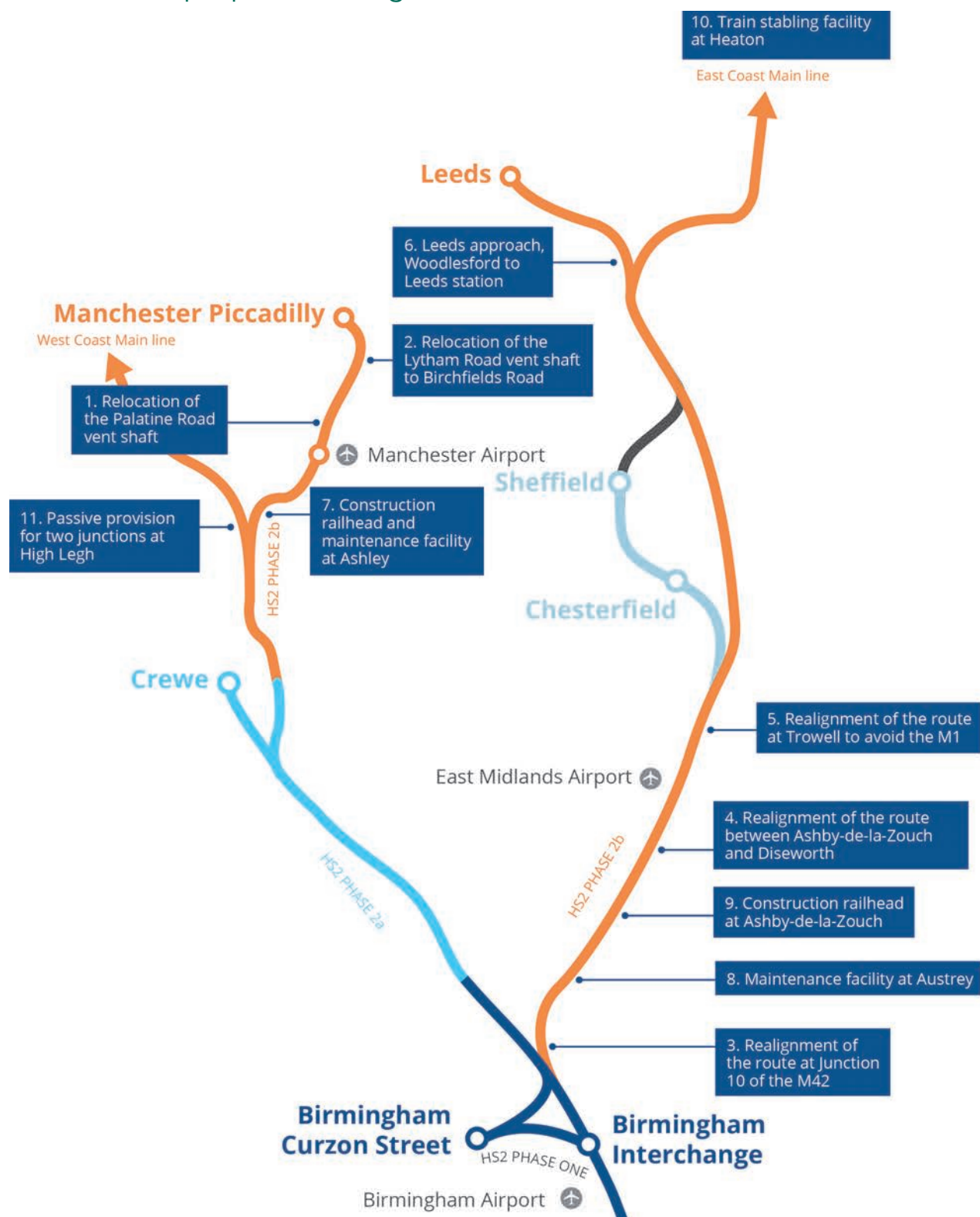


Figure 2: Locations of the proposed design refinements

## 2.1 Relocations and realignments

### Relocation of the Palatine Road tunnel vent shaft, West Didsbury, Manchester

Community area: MA07 | Davenport Green to Ardwick

#### Proposed change

**The Secretary of State is minded to relocate the vent shaft for the Manchester tunnel currently located within the Withington Golf Course to an alternative site within the golf course to reduce the impact on flood storage capacity in the area.**

#### Overview of the current design

- 2.1.1 The current design for the Manchester tunnel runs for 12.8km under the parish of Ringway and non-civil parish areas of Wythenshawe, Northenden, Withington, Longsight and West Gorton, emerging at Ardwick south-east of Manchester Piccadilly station.
- 2.1.2 Four vent shafts are needed along the length of the Manchester tunnel to:
- enable the smoke produced in the event of a fire to be extracted in a controlled manner, and to provide fresh air in order to create smoke-free evacuation routes;
  - provide access for routine maintenance and the emergency services; and
  - meet the comfort requirements of passengers and staff in tunnels by keeping the air quality and temperature within prescribed limits.<sup>4</sup>
- 2.1.3 The current design for the second of these shafts includes a headhouse and autotransformer station south of Ashfield Lodge on Withington Golf Course (see Figure 3 on page 22). The vent shaft would be approximately 54m in diameter and 27m deep.

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4 Shafts for ventilation and emergency access to tunnels are required approximately every three kilometres. Ventilation fans, lift machinery and emergency access doors would be housed in a 'headhouse' building located above the vent shaft. The final designs of tunnel headhouse buildings will be approved by local authorities in accordance with the planning regime established in the Phase 2b hybrid Bill.

- 2.1.4 At the surface above tunnel shafts buildings known as headhouses are required for control equipment, ventilation fans, lift machinery and emergency access doors. The final design and external appearance of the headhouses is yet to be determined, but will be approved by the relevant local authorities and will fit in with local surroundings.
- 2.1.5 At Palantine Road two vent shaft headhouses would be constructed. The first approximately 34m by 28m and the second 34m by 10m. Both would be approximately 6.5m high. The current design for the scheme in this location also includes an autotransformer station to provide power to the railway, located on the western side of the headhouses. The autotransformer station would be approximately 45m by 24m.
- 2.1.6 Access to the site would be via a purpose-built access road from Palatine Road (B5167) across Withington Golf Course to the site of the vent shaft.

## Issues identified with the current design

- 2.1.7 Further design development, environmental assessment and engagement have identified a number of issues with the current location of the Palatine Road vent shaft.
- 2.1.8 The most important of these issues is the impact of the vent shaft on the capacity of the Didsbury Flood Storage Basin and the flood management zones around the River Mersey. The Didsbury Flood Storage Basin is a key element in managing flood waters from the River Mersey and preventing flooding of properties along the Mersey Valley.
- 2.1.9 In response to the November 2016 Route Refinement Consultation, the Environment Agency and other stakeholders raised concerns about HS2 taking capacity from the Flood Storage Basin by constructing and operating the vent shaft within it. Since then, the Environment Agency has advised that in order to mitigate the increased risk of flooding caused by taking land from the Flood Storage Basin, HS2 would need to provide replacement flood storage capacity in the immediate vicinity of the vent shaft.
- 2.1.10 Although the current design does not show sites for replacement flood storage capacity, further work has demonstrated that if the vent shaft were to remain in its current location additional land would be required on Withington and Didsbury golf courses to provide replacement flood storage capacity.
- 2.1.11 To support the construction and maintenance of vent shafts, as well as provide access for maintenance staff and the emergency services, an access road is required from the local highway network. In the current design this access is provided by a road constructed from Palatine Road, across Withington Golf Course to the vent shaft. Due to the position of the vent shaft this would require further land to be taken from Didsbury Flood Storage Basin, which would also need to be compensated for.

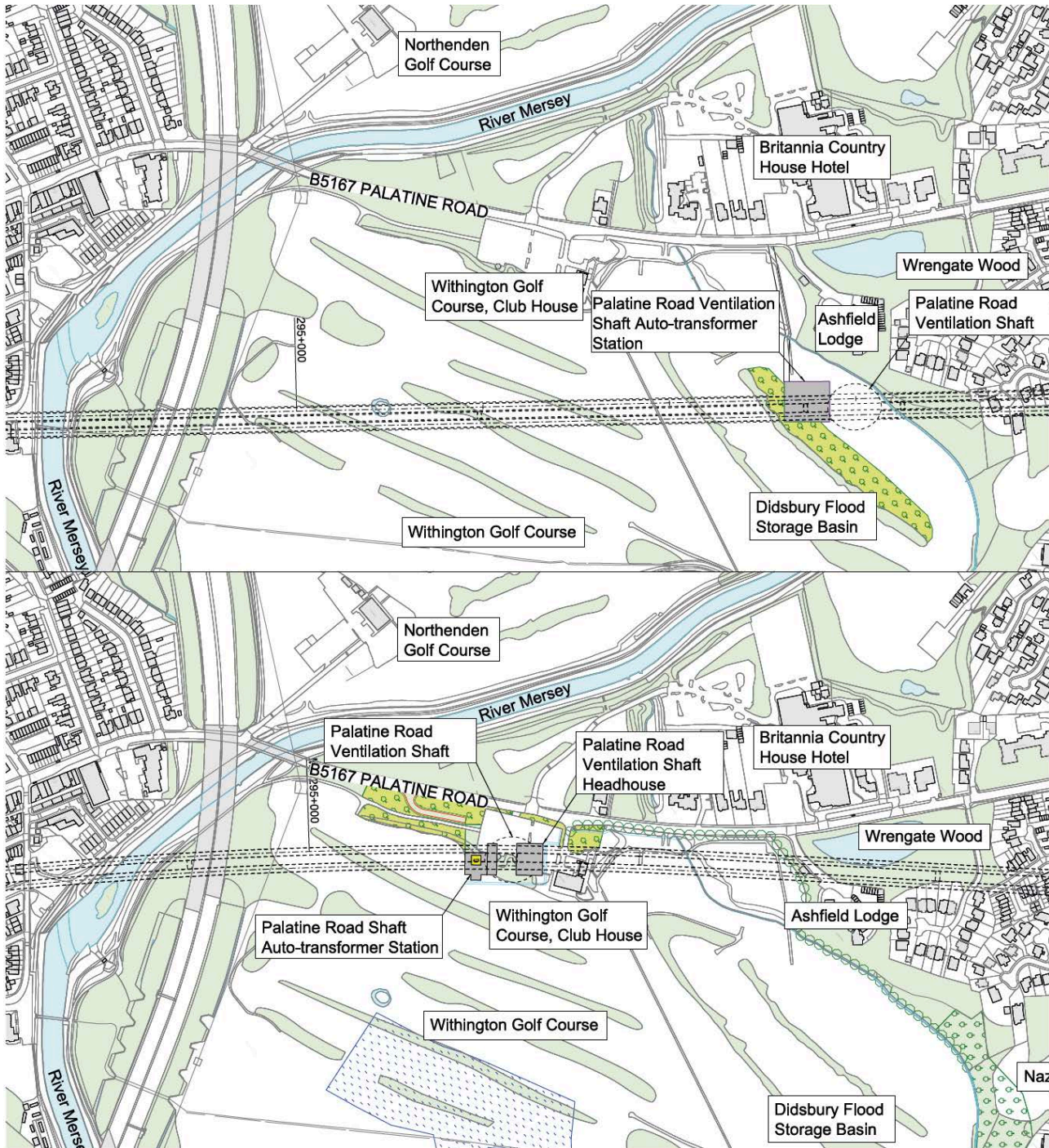
- 2.1.12 As well as the impact on flood storage, the current design has a negative impact on the operation of Withington Golf Course. The current design has the potential to result in the loss of up to three holes from the golf course during the construction phase and up to two once the railway is operational. Although the current design does not require land to be taken directly from Ashfield Lodge, located to the north of the vent shaft, construction of the vent shaft would cause disruption to residents.
- 2.1.13 As a result of these issues, HS2 Ltd has reviewed the design of the route in this area to determine if there are any viable alternatives that address the problems identified with the current design.

## Design refinement options

- 2.1.14 The identification of suitable alternative sites for the vent shaft is constrained by a number of factors, these include:
- the alignment of the tunnel;
  - the requirement for vent shafts to be regularly spaced along the length of tunnels; and
  - the limited availability of undeveloped sites above the tunnel in this predominantly urban area.
- 2.1.15 In addition to these general constraints, potential alternative sites for the Palatine Road vent shaft were further limited by the size of the site required to construct and operate this vent shaft. The current construction strategy for the Manchester tunnel assumes that the Tunnel Boring Machines (TBMs) used to bore the Manchester tunnel will be extracted from the Palatine Road vent shaft. To extract the TBMs requires a larger diameter vent shaft and a larger area for construction compounds during the construction phase.
- 2.1.16 No suitable alternative sites for the vent shaft could be found while maintaining the current alignment of the Manchester tunnel, so options were investigated for alternative tunnel alignments. Options for realigning the Manchester tunnel were constrained by HS2's track geometry requirements, the need to maintain the operating speed of the railway and the need to consider what impact moving the tunnel would have on the location of the vents shafts above it.
- 2.1.17 In order to facilitate a change in vent shaft location, HS2 Ltd explored vent shaft locations against a change to the horizontal alignment of the Manchester tunnel in the vicinity of Withington Golf Club. This change to the horizontal alignment of the tunnel has no impact on HS2 journey times and, combined with changes to the tunnel design elsewhere, would have the potential to shorten the overall length of the tunnel, reducing its cost and providing opportunities to avoid other impacts at the northern end.



## Description of the proposed change



**Figure 3: Plan showing the current design and proposed relocation of the vent shaft. For more detail see change one in Volume 2: Map book and visualisations.**

2.1.18 After reviewing the horizontal alignment of the Manchester tunnel the Secretary of State is minded to move the vent shaft, headhouse and autotransformer station further south-west within Withington Golf Course, closer to Palatine Road.

- 2.1.19 This location would move the vent shaft, headhouse and autotransformer station as far as practicable from the Didsbury Flood Storage Basin and, of the options investigated, would result in the least land being lost from the Flood Storage Basin. As a consequence, this would require the least amount of additional land to be taken in the immediate vicinity to re-provide flood storage capacity. As the vent shaft and associated construction compound would be closer to Palatine Road than the current design, it does not require an access road to be built across Withington Golf Course and helps in reducing land take from the Flood Storage Basin and provides more convenient access during the construction and operational phases.
- 2.1.20 The proposed change is preferred to the current design by the Environment Agency and moves construction works further away from Ashfield Lodge.
- 2.1.21 The proposed change is, however, likely to require the demolition of the club house at Withington Golf Course and the loss of most of the car park to enable construction of the vent shaft, autotransformer station and headhouse. Part of the 18th hole at the course would also be permanently required for the headhouse building.
- 2.1.22 Although the proposed change significantly reduces the amount of land required in the Flood Storage Basin compared to the current design, it still encroaches slightly and would require replacement flood storage capacity within Withington Golf Course, as well as replacement flood capacity on the adjacent Didsbury Golf Course. This would lead to the temporary loss of four holes on Didsbury Golf Course during work required to lower the existing ground level to create the replacement flood storage capacity. Further work is required with both Didsbury and Withington Golf Clubs to establish how the golf courses could be remodelled to accommodate the construction and operational phase impacts.
- 2.1.23 The Secretary of State recognises the proposed change leaves an impact on both Withington and Didsbury Golf Clubs. The Secretary of State expects HS2 Ltd to continue to engage with both Clubs and the Environment Agency on whether these residual impacts on the golf courses' operations can be avoided or reduced.

## Why the Secretary of State is minded to make this change

- 2.1.24 In order to reduce the impact on the Didsbury Flood Storage Basin and the volume of replacement flood storage capacity required, the Secretary of State is minded to relocate the Palatine Road vent shaft, headhouse and autotransformer station to the identified alternative site within the Withington Golf Course, closer to Palatine Road.

**Question: What are your views on the proposal to relocate the vent shaft, headhouse and autotransformer station within Withington Golf Course, moving it closer to Palatine Road?**

*Please indicate whether or not you support the proposed change, together with your reasons.*



## Relocation of the Lytham Road tunnel vent shaft to Birchfields Road, Fallowfield, Manchester

Community area: MA07 | Davenport Green to Ardwick

### Proposed change

**The Secretary of State is minded to relocate the vent shaft for the Manchester tunnel from the playing fields of Manchester Enterprise Academy on Lytham Road, to the car park of Fallowfield Retail Park on Birchfields Road.**

### Overview of the current design

2.1.25 The current design for the Manchester tunnel runs for 12.8km under the parish of Ringway and non-civil parish areas of Wythenshawe, Northenden, Withington, Longsight and West Gorton, emerging at Ardwick south east of Manchester Piccadilly station.

2.1.26 Four vent shafts are needed along the length of the Manchester tunnel to:

- enable the smoke produced in the event of a fire to be extracted in a controlled manner, and to provide fresh air in order to create smoke-free evacuation routes;
- provide access for routine maintenance and the emergency services; and
- meet the comfort requirements of passengers and staff in tunnels by keeping the air quality and temperature within prescribed limits.<sup>5</sup>

2.1.27 The current design for the fourth of these includes a vent shaft, headhouse and autotransformer station on a site in the grounds of Manchester Enterprise Academy (MEA) central school off Lytham Road. The vent shaft would be approximately 25m in diameter and 43m deep.

2.1.28 At the surface above tunnel shafts buildings known as headhouses are required for control equipment, ventilation fans, lift machinery and emergency access doors. The final design and external appearance of the headhouses is yet to be determined, but will be approved by the relevant local authorities and will fit in with local surroundings.

2.1.29 The headhouse located at the surface above the vent shaft would be approximately 30m by 29m and 6m in height.

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<sup>5</sup> Shafts for ventilation and emergency access to tunnels are required approximately every three kilometres. Ventilation fans, lift machinery and emergency access doors would be housed in a 'headhouse' building located above the vent shaft. The final designs of tunnel headhouse buildings will be approved by local authorities in accordance with the planning regime established in the Phase 2b hybrid Bill.

2.1.30 The current design also includes an autotransformer station to provide power to the railway located next to the headhouse. The autotransformer station would be approximately 49m by 12m.

2.1.31 Access to the site would be from Lytham Road.

## Issues identified with the current design

2.1.32 The open space off Lytham Road had previously been identified by HS2 Ltd as a suitable location for a vent shaft. At the time this site was originally selected, planning permission for MEA Central had not been granted. The school has now been built and it opened in 2017. If the vent shaft was kept in the current location there would be a direct impact on the school including a permanent loss of part of the school playing fields and car park, as well as a significant amount of disruption during the construction phase.

2.1.33 During the construction phase, access would be required to and from the construction compound for the vent shaft and autotransformer station. In the current design, it is presumed that heavy goods vehicles (HGVs) required for construction would access the site via a right turn off Birchfields Road onto Lytham Road, which is a small one-way residential road. To get construction vehicles from the site would require the removal of this one way system and the addition of traffic management measures. As well as impacting MEA Central, this would mean construction vehicles travelling past the adjacent Birchfield Primary School as well as residential properties along Lytham Road.

2.1.34 Residents and Manchester City Council have raised concerns about the suitability of this route and how construction vehicle movements could be safely managed alongside traffic for the school and to the properties on Lytham Road. Once the railway was constructed, access for maintenance and in case of an emergency would still be required. The number of vehicles associated with these activities would be lower than during the construction phase, however a permanent impact would remain.

2.1.35 As a result, HS2 Ltd has reviewed the design of the route in this area to determine if there are any viable alternatives that address the problems identified with the current design.

## Design refinement options

2.1.36 There are a number of constraints to identifying suitable sites for vent shafts, these include:

- the alignment of the tunnel;
- the requirement for vent shafts to be regularly spaced along the length of tunnels; and
- the limited availability of undeveloped sites in this predominantly urban area.



2.1.37 These requirements constrain the number of suitable alternative sites for the vent shaft.

2.1.38 Two potentially suitable alternative locations were investigated for the vent shaft, one at Manchester University playing fields and another at Fallowfield Road Retail Park. The Manchester University playing fields option off Moseley Road was not progressed. Although the site offered better access than the current design, it would impact on recreational facilities and the distance between the vent shaft on Lytham Road and the northern tunnel portal would be too great for safety and operational requirements.

## Description of the proposed change



Figure 4: Plan showing the current design and proposed relocation of the vent shaft. For more detail see change two in Volume 2: Map book and visualisations.

- 2.1.39 Having reviewed the potential alternative options, the Secretary of State is minded to move the vent shaft to a site on Fallowfield Retail Park. The proposed site is at the northern end of the retail park on land currently occupied by one of the retail park buildings, containing three retail units, and part of the car park. The site is approximately 200m further south of MEA Central school.
- 2.1.40 The proposed change would result in the permanent loss of land from the retail park. At this stage of design, assessments show this has the potential to require the demolition of three retail units. In addition to these potential demolitions, it is also likely that there will be additional impacts on other occupants of the retail park during construction due to their proximity to the works.
- 2.1.41 Access to this site during construction and operation would be via the A34 (Birchfields Road) which would be an improvement on the access arrangements in the current design both in terms of safety and the suitability of the road for the anticipated number of vehicle movements.
- 2.1.42 Although the proposed change reduces the impacts on residents on Lytham Road, the newly proposed location will have a permanent visual impact on properties on the western side of Birchfields Road. Construction of the vent shaft on the retail park site is also likely to result in some temporary impact on these properties due to their proximity to construction activities and associated traffic movements.
- 2.1.43 The proposed change would remove the potential impacts on MEA Central school, limiting these to temporary impacts associated with construction traffic using the A34 in the vicinity of the school.

### Why the Secretary of State is minded to make this change

- 2.1.44 In order to avoid a direct impact on the MEA Central school, the Secretary of State is minded to relocate the vent shaft, headhouse and autotransformer station to a site on the Fallowfield Retail Park.

**Question: What are your views on the proposal to relocate the vent shaft, headhouse and autotransformer station from the playing fields of MEA Central school on Lytham Road to the Fallowfield Retail Park car park on Birchfields Road?**

*Please indicate whether or not you support the proposed change, together with your reasons.*



## Realignment of the route at junction 10 of the M42, North Warwickshire

Community area: LA01 | Lea Marston to Tamworth

### Proposed change

**The Secretary of State is minded to replace the currently proposed cut and cover tunnel under junction 10 of the M42 with a bored tunnel to reduce impacts on the junction. This change also requires a minor realignment of the route through Kingsbury Water Park.**

### Overview of the current design

- 2.1.45 The current design, as set out in the Working Draft Environmental Statement (WDES) published in 2018, is for the railway to closely follow the route of the M42 in this area. The route includes a viaduct which runs over the edge of Kingsbury Water Park and a skewed crossing over the M42 near Kingsbury. The route then moves into a cutting between the M42 and Tamworth before passing under junction 10 of the M42 and the A5/Watling Street.
- 2.1.46 To enable the railway to pass under junction 10, the current design includes a cut and cover tunnel<sup>6</sup> and jacked box structure<sup>7</sup>. Construction of this infrastructure would require work to the roundabout at junction 10 and a temporary realignment of the M42.

### Issues identified with the current design

- 2.1.47 The current design requires a permanent realignment of the junction 10 roundabout, a temporary realignment of 1.2km of the M42 and construction of a skewed crossing of the M42 near Kingsbury to the south of junction 10. It would also cause disruption to the A5/Watling Street. Construction of the current design would have a considerable impact on the strategic road network for a period of approximately four and a half years.

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6 A cut and cover tunnel is constructed by excavating a cutting; constructing a box-type structure; and reinstating the ground over the top to its original level. This type of tunnel is generally used for short or shallow tunnels where the use of tunnel boring machines is not practical.

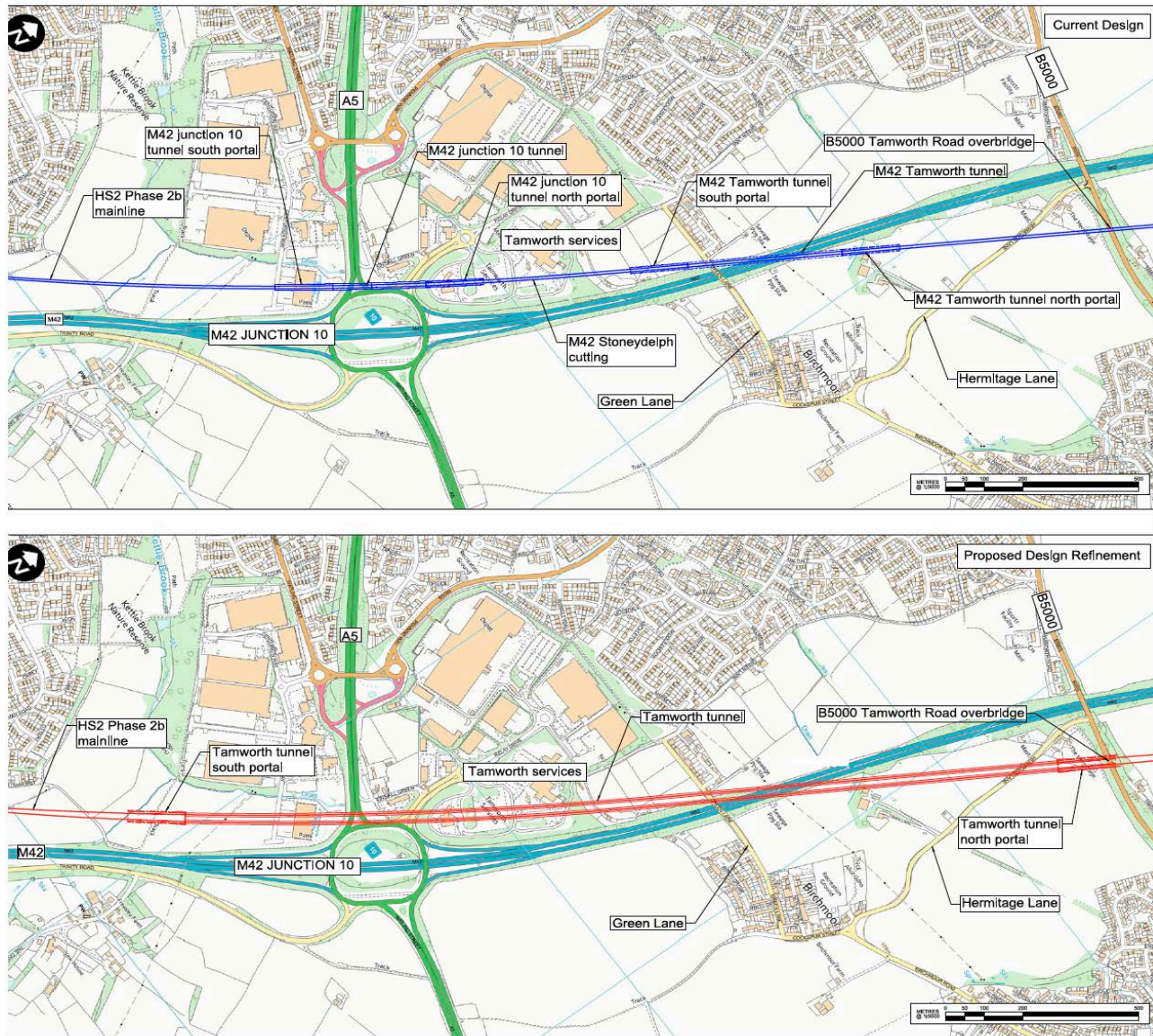
7 A jacked box is a concrete structure that can be installed horizontally using hydraulic jacks underneath an existing road or railway to avoid disruption to the road or railway during construction of, for example, an underpass.

- 2.1.48 The current design would also require the demolition of Tamworth service station at junction 10, a hotel, commercial premises at Kinsall Green and approximately 10 residential properties. The temporary realignment of the M42 would require Green Lane in Birchmoor to be closed for a period of three and a half years, with a 7km diversion being put in place.
- 2.1.49 The proposed location of the northern tunnel portal for the cut and cover tunnel would have a direct impact on the Hermitage Lane Business Park, and may require demolition of a warehouse.
- 2.1.50 Highways England, Warwickshire County Council, North Warwickshire Borough Council, Tamworth Borough Council and a number of businesses in the area have raised concerns about the impact of the current design, particularly in terms of the impact on properties and disruption to the strategic and local road network. In addition, local residents expressed concerns about the cumulative impact of construction traffic on existing traffic in the area and the level of disruption this could cause.

## Design refinement options

- 2.1.51 Consideration of feedback from a number of national and local stakeholders has led HS2 Ltd to reconsider the design of the scheme in this area to try and reduce impacts on junction 10, the strategic and local road network, and residential and business properties.
- 2.1.52 Two alternative options were considered. The first of these would involve the replacement of the cut and cover tunnel and the jacked box structure under junction 10 of the M42 with a 2km twin bored tunnel. This would avoid the complex construction works at junction 10 and the need for a temporary realignment of the M42.
- 2.1.53 The second option would involve a realignment of the HS2 route to the east of the M42. This would avoid the skewed crossing of the M42 to the south and reduce the interface of the route with junction 10 (although the route would still cross the A5 to the east of the junction 10 roundabout in a cut and cover tunnel). It would also avoid the need for a temporary realignment of the M42. This option would involve additional property impacts, island the community of Freasley between the M42 and the HS2 route, and require additional land take at Kingsbury Water Park. The provision of the cut and cover tunnel under the A5 would also result in significant disruption to the strategic and local road network, with the need for a temporary realignment of the A5. This option was not recommended.

## Description of the proposed change



**Figure 5: Plan showing the current design and proposed change at junction 10.**  
For more detail see change three in Volume 2: Map book and visualisations.

- 2.1.54 The proposed change replaces the cut and cover tunnel and jacked box structure under junction 10 of the M42 with a 2km twin bored tunnel. As shown on the plan above, the southern portal of the tunnel would be located to the south of junction 10 of the M42 and northern portal would be located at a point at which the HS2 alignment crosses the B5000.
- 2.1.55 The proposed scheme would diverge from the current alignment just south of Whateley, where the route would begin to deepen to allow it to go under junction 10 in a bored tunnel. The bored tunnel would be longer than the previously proposed cut and cover tunnel, meaning that the northern tunnel portal would no longer impact on



Hermitage Lane Business Park and would remove the need to realign Hermitage Lane avoiding the disruption to traffic this would cause.

- 2.1.56 The proposed change to the scheme to introduce a bored tunnel under junction 10 would:
- avoid direct impacts on the junction and the A5;
  - avoid the need to temporarily realign the M42 and the associated impacts on Birchmoor;
  - avoid the impacts on the service station, hotel and businesses in the vicinity of the junction; and
  - considerably reduce impacts on the strategic road network in the area.
- 2.1.57 Use of a bored tunnel would also reduce the number of demolitions compared to the current scheme design.
- 2.1.58 The potential sound, noise, vibration and air quality impacts of constructing a bored tunnel would also be less than for the previously proposed cut and cover tunnel.
- 2.1.59 The proposed change provides significant cost and programme savings and health and safety benefits during construction when compared to the current design.
- 2.1.60 As a result of the changes in the vertical alignment of the railway required for the bored tunnel, a set of crossovers<sup>8</sup> required for the operation of the railway need to be relocated. In the current design these crossovers are located in the Tamworth area. To create a straight section in the alignment at a constant gradient to accommodate these crossovers, the alignment needs to be moved approximately 20m east at Kingsbury Water Park.
- 2.1.61 This would increase the existing impact of the railway through the water park with more land required for construction than the current design. The Secretary of State expects HS2 Ltd to continue to work with Warwickshire County Council, the owners and operators of Kingsbury Water Park, to try and minimise the impact of this change.

## Why the Secretary of State is minded to make this change

- 2.1.62 The Secretary of State is minded to replace the currently proposed cut and cover tunnel under junction 10 of the M42 with a 2km bored tunnel in order to avoid direct impacts on junction 10 and the A5, avoid the need to temporarily realign the M42 and avoid direct impacts on the service station, hotel and businesses at junction 10.

### **Question: What are your views on the proposed replacement of the cut and cover tunnel under junction 10 of the M42 with a 2km bored tunnel?**

*Please indicate whether or not you support the proposed change, together with your reasons.*

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8 Track crossover – A pair of switches connecting two parallel rail tracks, allowing a train on one track to cross over to the other.



## Realignment of the route between Ashby-de-la-Zouch and Diseworth, Leicestershire

Community area: LA04 | Coleorton to Kegworth

### Proposed change

**The Secretary of State is minded to realign approximately 13km of the current route by a maximum of 170m to the east between Ashby-de-la-Zouch and Diseworth. This is to reduce impacts associated with crossing former open-cast mines and historic landfills at Lounge to the north of junction 13 of the A42.**

### Overview of the current design

- 2.1.63 The current route, as set out in the Working Draft Environmental Statement (WDES) published in 2018, would run along the eastern side the A42 from south of Ashby-de-la-Zouch to where the A42 joins the M1.
- 2.1.64 This section of the route would cross several historic open-cast coal mines at Lounge, which have subsequently been backfilled. Due to the topography in this area, the railway would be on high embankments along this section of the route.

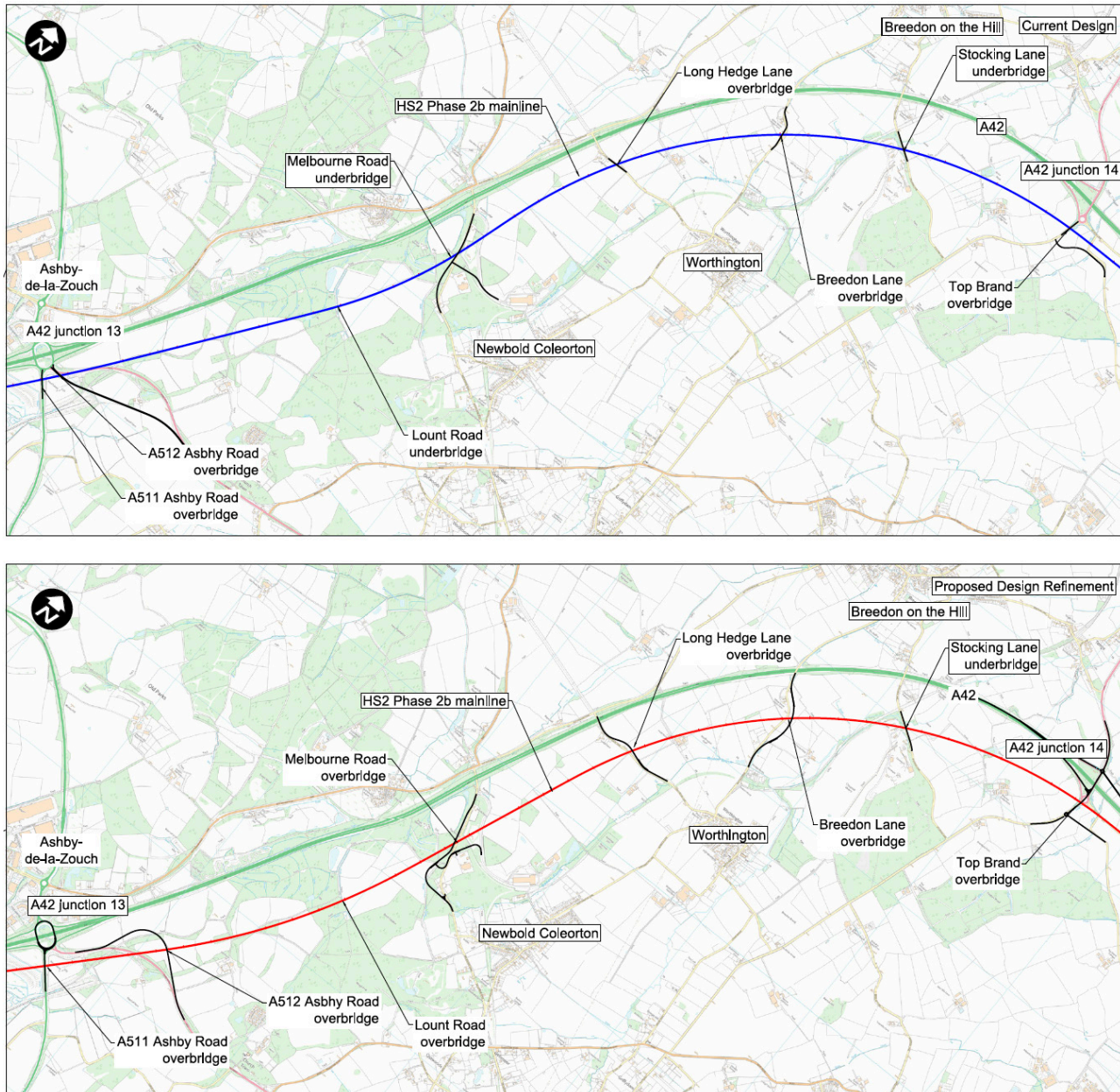
### Issues identified with the current design

- 2.1.65 Further design development has identified a number of issues with the current design. The most significant of these relates to the need for the route to be on high embankments over the areas of backfilled open-cast mines at Lounge, which requires significant ground improvement, excavation and remediation works.
- 2.1.66 In addition, the current design would directly impact Smoile Wood, a historic landfill site. Constructing the railway through this site would require additional measures to prevent disturbance of the waste and may require reconfiguration of the landfill management system.
- 2.1.67 As a result, HS2 Ltd has reviewed the design of the route in this area to determine if there are any viable alternatives that address the problems identified with the current design.

## Design refinement options

- 2.1.68 Two alternative options to the current design were identified and assessed. The first would involve lowering the route through the area to reduce the height of the embankments over the backfilled open-cast mines, thereby reducing the extent of ground improvement works required. Although this option would be cheaper than the current design, it would require a major change to the vertical alignment of the route, including the introduction of cuttings up to 34m deep, which would result in new risks associated with slope stability and drainage. It would also increase the volume of material to be excavated, increasing the duration of the construction programme and the number of construction vehicles on the local road network. This additional construction activity would result in increased air quality and noise impacts. This option was therefore not recommended.
- 2.1.69 The second alternative option would involve the realignment of the route to the east by up to 170m. This would reduce the extent and depth of open-cast mining crossed by the route and the need for ground improvements to reduce the geotechnical risks associated with the current design. This would also reduce the potential impact on the Smoile Wood landfill site.
- 2.1.70 The realignment would remove the need for high embankments or very deep cuttings, due to following a route with a less varied topography. This would reduce the amount of earthworks required to build the railway, the duration of the construction programme and impacts on the road network by reducing lorry movements. It would also take the alignment further away from junction 13 of the A42, reducing the impact on that the junction, and would provide a cost saving when compared against the current design.

## Description of the proposed change



**Figure 6: Plan showing the current design and proposed realignment. For more detail see change four in Volume 2: Map book and visualisations.**

2.1.71 The alternative option being proposed would move the horizontal alignment of the railway up to 170m to the east in the Newbold area whilst the alignment would move slightly further to the west near junction 14 of the A42.

2.1.72 The proposed realignment would move the route further away from the area of open-cast mining at Lounge and reduce the associated geotechnical risks, including the crossing of the Smoile Wood landfill.

2.1.73 In addition, reducing the height of the embankments and depths of cuttings along this section of the route would reduce the scale of work required to construct the railway and the number of vehicle movements needed for construction, providing both programme and cost savings. The operational railway would also have less visual impact on the surrounding landscape due to the reduced embankment heights.

2.1.74 The proposed change to the alignment would, however, introduce some additional impacts including:

- bringing the railway closer to three residential properties, including the Grade II listed Hall Farm and Breedon Lodge Farmhouse and Cottage;
- increased disturbance to the Lount Meadow Site of Special Scientific Interest (SSSI) and coal mining scheduled monuments at Smoile Farm, Birch Coppice and Rough Park;
- marginally increased impact on the proposed G-Park development site to the east of junction 13 of the A42; and
- running closer to junction 14 of the A42, potentially resulting in the need for changes to the junction and slip road.

2.1.75 The Secretary of State expects HS2 Ltd to engage with any directly affected parties in relation to the issues identified.

## Why the Secretary of State is minded to make this change

2.1.76 To reduce the risks and potential impacts associated with constructing and operating the railway through former open-cast mines and historic landfills to the north of junction 13 of the A42 at Lounge, the Secretary of State is minded to realign approximately 13km of the route between Ashby-de-la-Zouch and Diseworth.

### **Question: What are your views on the proposed change in the alignment between Ashby-de-la-Zouch and Diseworth?**

*Please indicate whether or not you support the proposed change, together with your reasons.*



## Realignment of the route at Trowell in Nottinghamshire

Community area: LA06 | Stapleford to Nuthall

### Proposed change

**The Secretary of State is minded to realign the current route to the east as it passes through Trowell to avoid the need to permanently realign the M1.**

### Overview of the current design

- 2.1.77 The current route, as set out in the Working Draft Environmental Statement (WDES) published in 2018, travels north from East Midlands Hub station on a 2.6km viaduct passing over the River Erewash, Erewash Canal, Stanton Gate, Stapleford Road (A6007), Erewash Valley railway line and the Radford and Trowell railway line before returning to embankment.
- 2.1.78 The current HS2 alignment requires a permanent realignment of 2.1km of the M1 between the River Erewash and Stapleford Road (A6007), moving the motorway by up to 90m to the west of its current location. The realignment of the motorway would also require the widening of the M1 Ilkeston Road Bridge, and the construction of new bridges to allow the realigned motorway to cross the Erewash Canal, the railway into Stanton Works, the Erewash Valley railway line, and River Erewash. In addition, Stapleford Road Bridge over the M1 would have to be rebuilt and a Public Right of Way (Nottinghamshire, Trowell Footpath No.5) would have to be realigned.

### Issues identified with the current design

- 2.1.79 The permanent realignment of the M1 required as a result of the current HS2 design would take three and a half years to complete and would lead to significant impacts on traffic using the motorway and the surrounding road network.
- 2.1.80 Stakeholders have expressed concerns about the impact of works to realign the M1 on the national, regional and local economy given the importance of this key transport corridor. The disruption caused by recent upgrade works to the M1 in this area has contributed to this concern. The East Midlands Councils' Mitigation Board expressed this view in their recent response to the WDES consultation.
- 2.1.81 The local community has also expressed concerns about the height of the viaduct through Trowell in the current design, and the associated noise and visual impacts.
- 2.1.82 There would also be safety risks associated with constructing the route within an operational motorway carriageway.

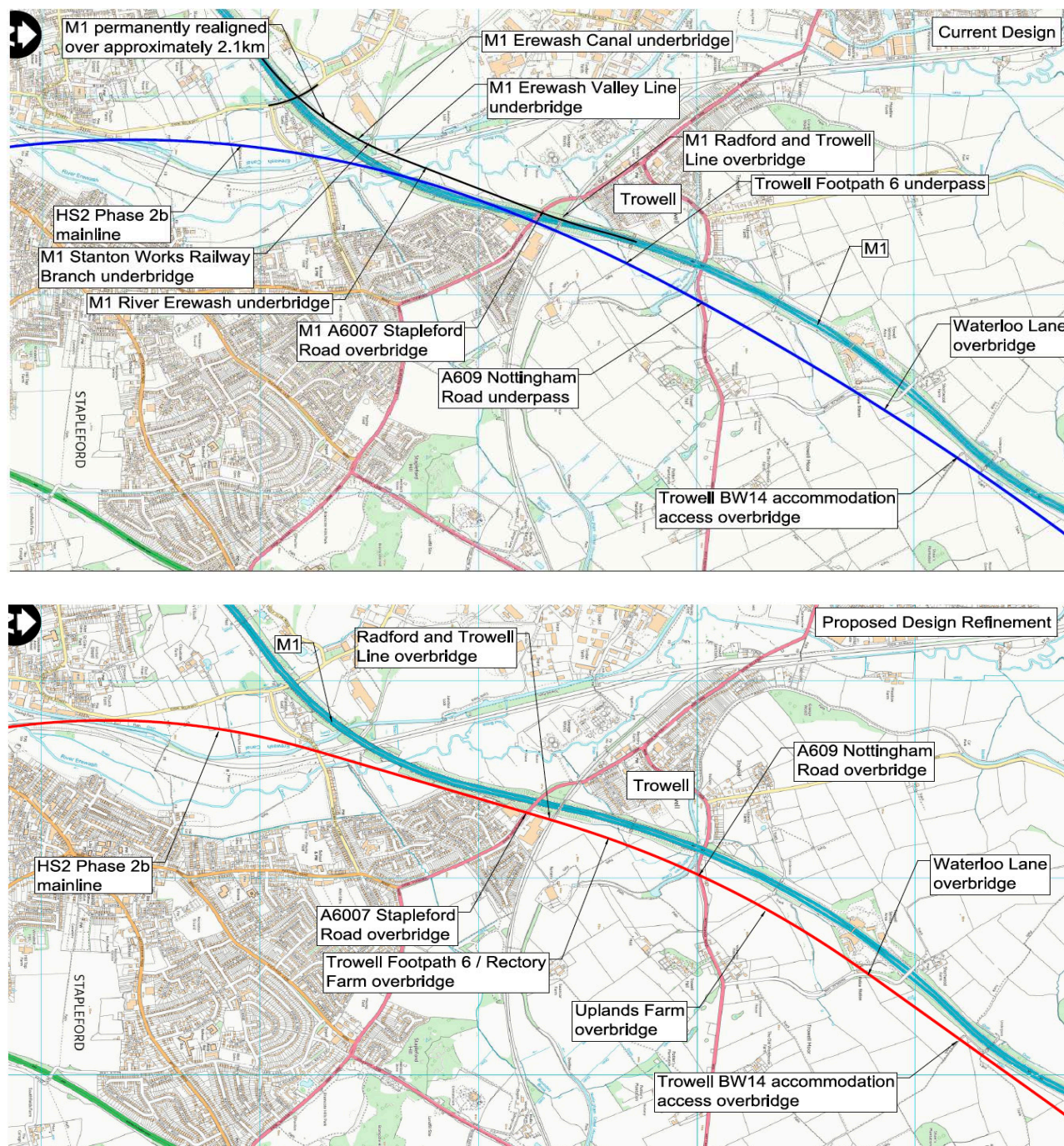
- 2.1.83 Based on the combination of issues identified above, HS2 Ltd has reviewed the current design to see if there are any viable alternatives that would avoid the need to permanently realign the M1 in this area.

## Design refinement options

- 2.1.84 HS2 Ltd assessed two alternative options in order to try to avoid the disruption, cost and construction programme implications associated with the need to permanently realign the M1. Both of these options would involve a realignment of the HS2 route by approximately 80m to the east of the current alignment, moving the route to the east of the existing M1.
- 2.1.85 One of the alternative options would then involve a vertical alignment similar to the current route (10-15 metres higher than the M1, and 15-20 metres above ground level), while the other alternative option would adopt a lower vertical alignment, similar to the level of the M1.
- 2.1.86 Both options would avoid the need for the M1 to be realigned, reducing the interface with the strategic and local road network at this point and the associated national, regional and local traffic disruption, and providing cost, risk, safety and programme benefits.
- 2.1.87 Both options would, however, increase the impact on property in the area. The option adopting a lower vertical alignment would lead to approximately 20 additional demolitions to the current design, whilst the option adopting the higher vertical alignment would require even more additional demolitions than the lower option.
- 2.1.88 The eastern alignment of both options would also potentially worsen construction impacts for residential properties to the east of the M1 in Trowell, although the significant programme reduction would mean that this impact would occur for a shorter period of time. There would also potentially be a minor worsening of operational noise impacts because the HS2 alignment is closer to residential properties and the M1 remains on its current alignment.
- 2.1.89 The option of adopting a lower vertical alignment would result in a shorter viaduct (both against the current scheme and the alternative option adopting a higher alignment), and a reduction in height of approximately 20m from the current scheme. This would reduce the overall visual and landscape impacts associated with the current design, helping to address some of the significant stakeholder concerns that have been raised to date.
- 2.1.90 The lower alignment option was identified by HS2 Ltd as the most viable alternative to the current design given the reduction of major interfaces with the M1 and the resultant reduction in disruption, cost, risk and programme timetable and the potential for improved environmental mitigation due to the lower HS2 alignment.



## Description of the proposed change



**Figure 7: Plan showing the current design and proposed realignment at Trowell.**  
For more detail see change five in Volume 2: Map book and visualisations.

2.1.91 The proposed change being consulted on would involve realignment of the current HS2 route between Derby Road in Long Eaton and the approach to a tunnel at Strelley (a distance of around 5km). It would mean moving the alignment of the route as it passes Trowell by approximately 80m to the east in order to avoid the M1.

- 2.1.92 The railway would be on viaduct for much of this section to allow the line to pass over the River Erewash, the Erewash Canal, Stanton Gate, Stapleford Road (A6007), the Erewash Valley railway line and the Radford and Trowell railway line before moving onto a combination of embankment and cutting through Trowell.
- 2.1.93 The proposed change would avoid the need to realign the M1. Reducing the impact on this strategically important transport corridor and the associated impacts on the local road network would reduce the potential effect on the national, regional and local economy. It would also avoid the effect associated with constructing around 2km of new motorway on new ground to the west of the current motorway alignment. This would significantly reduce the cost and construction programme associated with the current design. Adopting a lower vertical alignment would also reduce the overall visual and landscape impacts associated with the current design of the railway.
- 2.1.94 There are new impacts associated with the proposed change. These include increased property impacts, with approximately 20 additional demolitions, the majority of which would be on Tiree close and Iona Drive.
- 2.1.95 In addition, the proposed realignment would bring the railway closer to residential properties at Islay Close, Iona Drive, Buttermead Close and Trowell Park Drive. This would likely increase the impacts of the construction and operation of the railway on people living in this area. However, in the case of the construction phase impacts, it should be noted that the proposed change would result in a shorter construction programme, reducing the duration of these impacts.
- 2.1.96 The proposed realignment would lead to a reduction in the potential impact on the Stanton Gate Local Nature Reserve but would have a direct impact on the Moorbridge Lane Local Wildlife Site due to more earthworks being required in the site. There would also be a reduction in the disturbance of the River Erewash by avoiding the realignment of the M1.
- 2.1.97 The Secretary of State is aware of the additional impacts on the community of Trowell, particularly the additional demolitions and has asked HS2 Ltd to continue to engage with the local community and stakeholders so that further opportunities to avoid, reduce or mitigate impacts are considered in ongoing design development.

## Why the Secretary of State is minded to make this change

- 2.1.98 The Secretary of State is minded to realign the route as it passes through Trowell to remove the need to realign the M1 and reduce the disruption, costs, risks, construction programme and overall visual and landscape impacts associated with the current design.

### **Question 10: What are your views on the proposal to realign the route as it passes Trowell to avoid the need to realign the M1?**

*Please indicate whether or not you support the proposed change, together with your reasons.*



## Leeds corridor, Woodlesford to Leeds Station

Community area: LA17 | Stourton to Hunslet and LA18 | Leeds Station

### Proposed change

**The Secretary of State is minded to change the height of the route for 8km on the approach into Leeds station so the line runs predominantly on a viaduct, rather than a combination of at ground level, cutting and embankment.**

### Summary of the current design

- 2.1.99 In the current design the Leeds Spur branches away from the HS2 mainline south-east of Oulton at the Moss Carr junction. The Leeds Spur then heads north-west before entering a 2km bored tunnel to the south of Woodlesford. The tunnel then passes under Woodlesford before emerging between Network Rail's Hallam Line and the Aire and Calder Navigation Canal approximately 1km to the west of Woodlesford.
- 2.1.100 The existing Hallam Line would be realigned southwards for 2.5km from where the Woodlesford tunnel begins to rise towards the surface at Stourton. This would require the construction of a new crossing under the M1 for the Hallam Line.
- 2.1.101 From Stourton, the HS2 alignment and the Hallam Line would run in parallel for 3.5km, diverging north of junction 4 of the M621 where HS2 runs through the Southbank area to the new HS2 station. This section of the route would require works to 12 bridges across the Hallam Line and the closure of Jack Lane.

### Issues identified with the current design

- 2.1.102 Engagement with stakeholders, ongoing environmental assessment and design development has highlighted the complexity of the current design and potential extent of impacts resulting from the construction of a Leeds Spur. A number of issues with this proposal have been identified including:
- disruption to the existing Hallam Line during construction, including impacts on both passenger and freight services;
  - disruption to the existing local and strategic highway networks, including impacts on private and business users, in addition to public transport;
  - number and size of utility diversions required;
  - restrictions likely to be applied to the HS2 construction programme due to limited, or restricted access to the highway network, and rail network; and
  - the number and duration of construction traffic movements, including HGVs on the local and strategic highway network.

2.1.103 In response to the issues identified above, HS2 Ltd investigated alternative options for the approach to Leeds.

## Design refinement options

2.1.104 The current horizontal alignment for HS2 into Leeds is heavily constrained. The approach to Leeds Station runs through an urban area and the need to minimise impacts on people and businesses, while avoiding existing infrastructure, means there are a limited number of alternatives to the current horizontal alignment confirmed by the Secretary of State in July 2017.

2.1.105 A number of alternative vertical alignments for the route into Leeds were considered to address the issues identified with the current design. The first option followed a broadly similar horizontal alignment as the current design to the east of the M1 and maintained the current length of the Woodlesford tunnel. Then, unlike the current design, the route would run mainly on a viaduct from a point to the west of the M1 crossing and onwards to Leeds HS2 Station. This option did not avoid the need to realign the Hallam Line, this includes the construction of a new structure under the M1 for the Hallam Line which would have to be constructed from the M1 itself. This option would reduce the number of highway works required west of the M1 to Leeds HS2 Station though would not address some of the major issues associated with the current design. For these reasons, this option was not progressed.

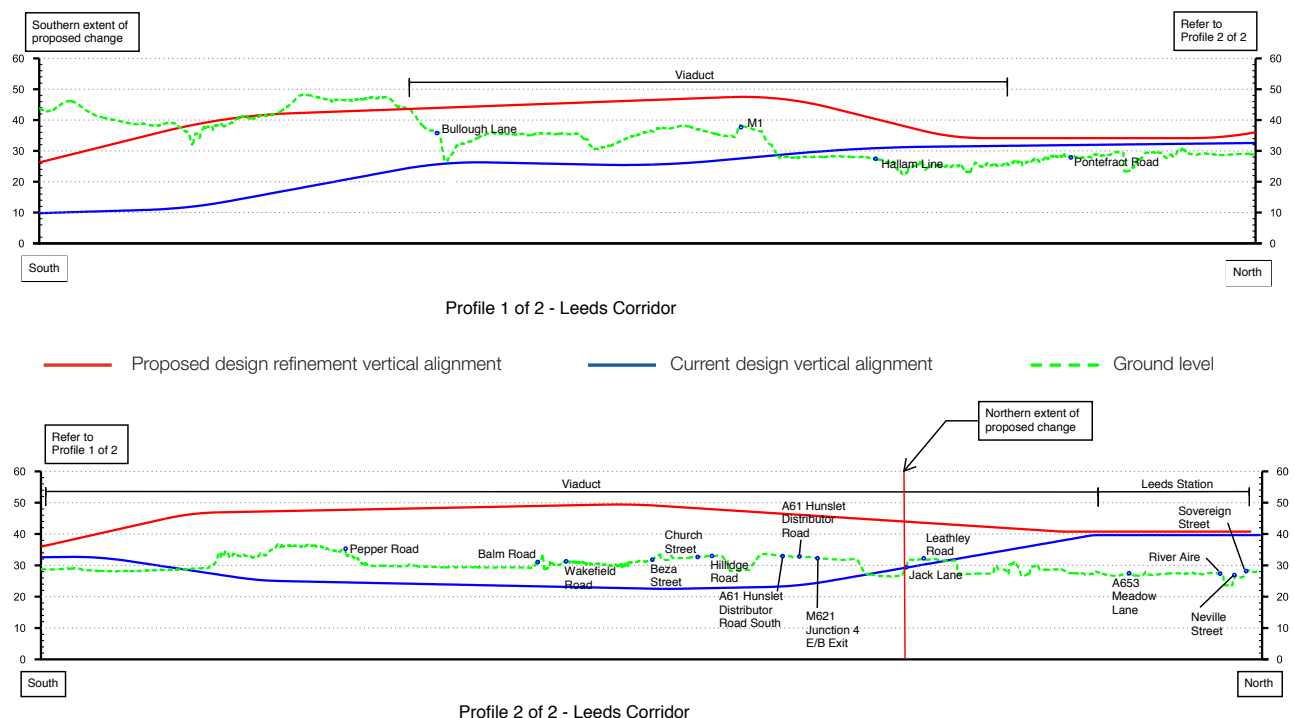
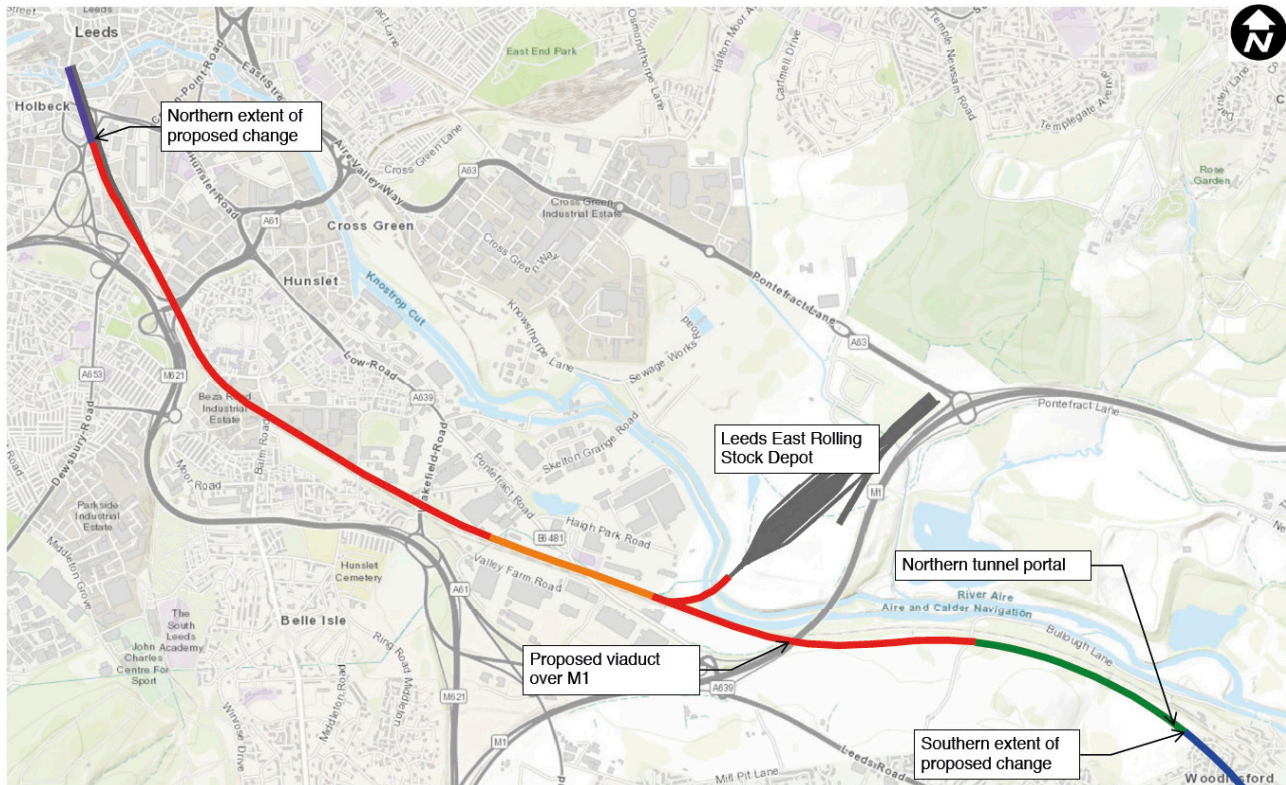


Figure 8: Profiles to illustrate two alternative options to the current design considered for the approach to Leeds station.

## Description of the proposed change



**Figure 9: Plan showing the proposed alignment of approach to Leeds station. For more detail see change six in Volume 2: Map book and visualisations.**

- 2.1.106 The proposed change would see the Woodlesford tunnel shortened so that it emerges closer to the village of Woodlesford. The Leeds Spur would then climb onto a viaduct through the northern edge of Rothwell Country Park, continue on a viaduct to a point east of the M1 crossing, crossing over the top of the Hallam Line. The route would be constructed on embankment for 400m between Pontefract Road and the connection into the east of Leeds Rolling Stock Depot. Then the route would continue on a viaduct for 3.3km into Leeds Station crossing above the local and strategic highway network, with a typical clearance of 5.7m from existing road level to the underside of the viaduct.
- 2.1.107 The proposed change avoids the need to realign the Hallam Line and the associated new box structure under the M1. The proposed change potentially avoids the need to reconstruct nine bridges between the M1 and the Southbank, significantly reduces the number of utility diversions and potentially avoids the need to close Jack Lane. This would reduce the amount of disruption during construction of the railway, remove some of the constraints in the construction schedule and would bring about a cost saving.

- 2.1.108 The proposed change will increase the visual impacts of the scheme on communities from Woodlesford to central Leeds and requires more construction works in Rothwell Country Park. Although the proposed change brings the northern portal of the Woodlesford tunnel and construction compounds closer to residents in Woodlesford, further assessment of the current design has shown that if the Woodlesford tunnel length was maintained there would need to be a vent shaft constructed at approximately the same point. This means that even if the current design with a longer Woodlesford tunnel were to be retained, there would be construction and operational impacts closer to residents in Woodlesford than those reported in the WDES.
- 2.1.109 Further work is required to establish what level of impact the proposed change will have on the rail supported businesses located along the Network Rail corridor, which were separated from the current design. The Secretary of State expects HS2 Ltd to continue to engage with business owners here to ensure as many as possible can remain in situ.

### Why the Secretary of State is minded to make this change

- 2.1.110 The Secretary of State is minded to change the height of the route for 8km on the approach to Leeds station so the line runs predominantly on a viaduct rather than a combination of at ground level, cutting and embankment.

#### **Question: What are your views on the proposal to change the height of the route on the approach into Leeds?**

*Please indicate whether or not you support the proposed change, together with your reasons.*

## 2.2 New infrastructure

### New infrastructure

- 2.2.1 This section of the consultation document includes details of the following proposed changes:

Proposed new infrastructure	Page number
Temporary construction railhead and permanent maintenance facility at Ashley, Cheshire	47
Permanent maintenance facility at Austrey, North Warwickshire	51
Temporary construction railhead at Ashby, Leicestershire	54
Permanent train stabling facility at Heaton, Newcastle-upon-Tyne	57

- 2.2.2 The first part of this section provides a summary of the purpose of this new infrastructure, before sections describing each of the proposed changes.

### Temporary construction railheads

- 2.2.3 The installation of the rail systems for the Phase 2b scheme will start after the civil engineering installation of structures, earthworks and tunnels is complete. Elements of the rail systems include track laying, overhead line equipment, signalling and communications equipment and testing and commissioning.
- 2.2.4 To construct the rail systems elements for Phase 2b, temporary construction railheads will be required. These will need to be connected to the conventional railway and the HS2 mainline, and are referred to as ‘railheads’.
- 2.2.5 A connection to the conventional railway is essential because certain rail systems materials, such as continuous welded rail cannot reasonably be delivered by road. Other rail systems materials, such as aggregates, overhead line equipment and cables could be delivered by road, but given the large amounts of materials required, it will be beneficial to deliver these by rail where possible, to reduce the number of construction vehicles using the public road network.



- 2.2.6 A railhead will usually act as the main construction compound for managing the rail systems installation, and needs to have the space and facilities to be able to receive, handle and store enough materials to maintain an efficient rail systems installation programme.
- 2.2.7 Core functional requirements of a railhead include: a connection to the conventional railway network to a line that can accommodate freight trains to deliver and remove material; good connection to the road network; connection, preferably in both directions, to the HS2 mainline; and suitable space to load and unload trains as well as to store, trains and materials.
- 2.2.8 Rail systems installation is generally carried out in a ‘linear’ manner, working away from the railhead, using newly installed track to deliver materials further along the route. This limits the efficient range of the railhead to a distance of approximately 50km (based on experience of other high speed rail projects).
- 2.2.9 For the eastern leg, this means that more than one railhead is being proposed. On the western leg, due to its shorter length, one railhead is currently being proposed.
- 2.2.10 During the design development process, consideration has been given to the location of railheads at both a strategic and local level. Appraisals of the options have been carried out to select optimal strategic locations based on the spacing and functional requirements set out above. Local appraisals have also been carried out to determine the most appropriate site and layout within that broader area.
- 2.2.11 Following this process, three railhead locations have been identified to support the delivery of the eastern leg of Phase 2b and one railhead location identified to support the delivery of the western leg.
- 2.2.12 Two of the railhead locations were reported in the Phase 2b working draft Environmental Statement in late 2018.
- 2.2.13 The Secretary of State is consulting on proposals to include two further railheads in the scheme, one on the western leg at Ashley in Cheshire, and one on the eastern leg at Ashby-de-la-Zouch in Leicestershire.

## Permanent infrastructure maintenance bases

- 2.2.14 Once the new railway has been built, infrastructure maintenance bases (IMB-Rs) will be used for the storage of trains which will maintain the railway overnight.
- 2.2.15 During the day, operations at IMB-Rs will include planning, management and preparation for maintenance activities, such as loading maintenance trains. Once the passenger service draws to a close in the evening, maintenance trains will leave the IMB-Rs and travel to wherever maintenance is required on the railway. The majority of actual maintenance works will be carried out away from the IMB-Rs and along the

railway. The maintenance trains will then return to the IMB-Rs before passenger services start again in the morning.

2.2.16 The identification of suitable locations for IMB-Rs is influenced by a number of factors including:

- the need for these facilities to be distributed at strategic locations along the route;
- connection to the conventional railway network to a line that can accommodate freight trains to deliver and remove material;
- good connection to the road network;
- the ability to construct a direct connection to the HS2 mainline; and
- suitable space to load and unload trains as well as to store equipment, trains and materials.

2.2.17 The IMB-R at Stone in Staffordshire, on Phase 2a of HS2, is proposed as the main maintenance facility for the western leg of Phase 2b. However, further assessment of the maintenance requirements for Phase 2b, has shown the need for an additional smaller maintenance facility further north on the western leg. The Secretary of State is consulting on a proposal to locate this facility near Ashley in Cheshire.

2.2.18 The Secretary of State is also consulting on a proposal to include an IMB-R on the eastern leg at Austrey, North Warwickshire.

## Permanent HS2 train stabling facilities

2.2.19 Stabling facilities for HS2 trains serving the north are needed to store trains overnight where it is operationally impractical for them to be returned to the on-route rolling stock depots (RSDs). Cleaning and light maintenance would be carried out at the stabling facilities.

2.2.20 One off-route stabling facility is needed for each leg of HS2. The Secretary of State is consulting on the provision of one of these facilities at the existing Network Rail depot at Heaton, which is located 3km north-east of Newcastle Central station. This would serve the stabling needs of the eastern leg of Phase 2b.

## Temporary construction railhead and permanent maintenance facility near Ashley, Cheshire

Community area MA06 | Hulseheath to Manchester Airport

### Proposed change

The Secretary of State is minded to introduce two pieces of new infrastructure near Ashley. One is a temporary railhead south of the route alignment to support construction of the new railway. The second is a permanent infrastructure maintenance base – rail (IMB-R) at a separate site north of the route and to the west of Ashley.

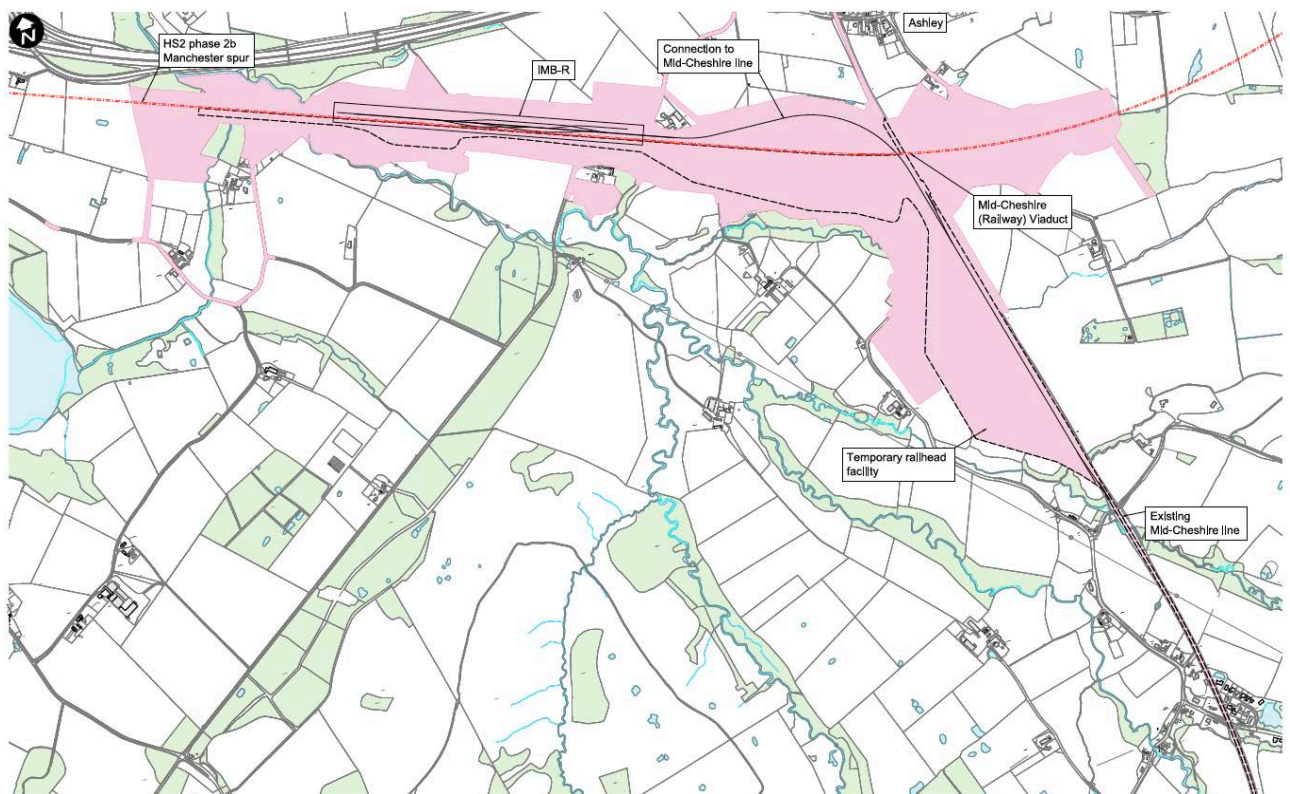


Figure 10: Plan showing the proposed location of temporary railhead and permanent IMB-R near Ashley. For more detail see change seven in Volume 2: Map book and visualisations.

## Railhead

### Identification of the proposed site

- 2.2.21 Further design development has identified the need for temporary railheads across the eastern and western legs at strategic junctures to support the construction of Phase 2b.
- 2.2.22 Based on consideration of the construction strategy and requirements set out on page 44 above, HS2 Ltd has identified that the most suitable location for a railhead on the western leg is between the Manchester Spur and the existing Mid-Cheshire Line in the vicinity of Ashley.
- 2.2.23 A railhead in this location would have a connection to the existing railway via the Mid-Cheshire Line, is well placed to support rail systems construction activities along the Manchester Spur and has good access to the strategic road network through its proximity to the M56.

### Design refinement options

- 2.2.24 Three sites were considered as potential locations for a railhead in the vicinity of Ashley. The first of these was on the eastern side of the Mid-Cheshire Line and on the southern side of the Manchester Spur (known as Option 1). The second was on the western side as the Mid-Cheshire Line, but on the northern side of the HS2 Manchester Spur (referred to as the 'Baseline' option). The third was also located on the western side of the Mid-Cheshire Line, but to the south of the HS2 Manchester Spur (Option 2).
- 2.2.25 All of the potential options for railheads in this area would have a potential noise impact on Ashley Village during the construction phase of HS2. However, Option 1 would have a potential noise impact on residents in Thorns Green, as well as Ashley village. Option 1 also requires more earthworks than Option 2, bringing with it higher anticipated noise, air quality and cost impacts. For these reasons, Option 1 was not progressed.
- 2.2.26 The option referred to as the 'Baseline' option was not progressed as, compared to Option 2, it brought construction impacts closer to Ashley village, with higher noise and air quality impacts. It is also more expensive and required a longer construction programme due to a requirement for more earthworks than Option 2.
- 2.2.27 Although Option 2 is likely to have an additional impact on two farms compared to the other options, it is likely to have the lowest noise and visual impacts on Ashley, requires the smallest overall site to construct the railhead, requires fewer earthworks, is likely to lead to a shorter railhead construction programme, making it less disruptive to residents and is cheaper than the alternatives.
- 2.2.28 For these reasons the Secretary of State is minded to include Option 2 in the scheme.

### Impacts of the proposed site

- 2.2.29 The railhead will consist of ten temporary rail sidings with a connection to the Mid-Cheshire Line, welfare facilities, car parking, office space and internal roads. The proposed site of the railhead is approximately 400m south-west of Ashley.
- 2.2.30 There are a number of potential impacts associated with constructing and operating a railhead at this site. Part of the proposed railhead site would be located within Erlam's Meadow Local Wildlife Site and Site of Biological Interest. The site is also within the Impact Risk Zone of Rostherne Mere with a number of waterbodies crossing the site needing further investigation to understand the full impacts. The railhead could also have a major visual impact on the local landscape and impacts on the land and property of two farms. The construction of the railhead would also introduce additional construction vehicles on roads in the area while the railhead is constructed. This could in turn bring about further noise and air quality impacts to the area.

### IMB-R

#### Identification of the proposed site

- 2.2.31 On Phase One and Phase 2a of HS2, IMB-Rs have been included in the design of the scheme submitted to Parliament to support the efficient maintenance of the railway in the operational phase. As design development on Phase 2b has progressed, further work has been undertaken to identify suitable sites for an IMB-Rs.
- 2.2.32 The IMB-R on the western leg is proposed at a site approximately 300m south-west of Ashley village. The site will consist of two sidings up to 300m in length to stable maintenance trains, a small amount of storage space and a car park for 10 vehicles.
- 2.2.33 If it had been feasible, this IMB-R would have been placed on the same site as that currently proposed for the temporary railhead. Once the railhead had finished being used for the construction phase, a portion of that site would have been converted into an IMB-R with the remaining area of the railhead site being returned to its former use.
- 2.2.34 However, it has not been feasible to use part of the site proposed for the railhead in this area as an IMB-R. This is due to the inclusion of passive provision for the junction to support a potential NPR Manchester to Liverpool route (see pages 61–66). The inclusion of passive provision means that a permanent, flat, rail connection from HS2's Manchester Spur into the IMB-R could not be built without also raising this connection onto another viaduct. For this reason, a design with the IMB-R on the site of the temporary railhead was not progressed.
- 2.2.35 The proposed location of the IMB-R is compatible with passive provision for the Manchester to Liverpool junction, does not require a third viaduct over the Blackburn/Birkin Brooks and allows a connection to Network Rail to be provided.



### Impacts of the proposed site

2.2.36 There are several potential impacts associated with the construction and operation of an IMB-R at this location. These would be:

- additional temporary and permanent land take in the area for the construction and operation of the IMB-R;
- additional construction vehicle movements required during the construction phase to build the IMB-R; and
- construction phase impacts (sound, noise and vibration, as well as visual impacts) brought closer to Ashley village. Previously, works for HS2 were confined to the southern side of the HS2 route, whereas the IMB-R is proposed on the northern side of the railway.

2.2.37 The Secretary of State expects HS2 Ltd to mitigate these impacts as far as reasonably practicable, for instance introducing earthworks to screen the IMB-R from the village of Ashley.

### Why the Secretary of State is minded to make this addition

2.2.38 The Secretary of State is minded to include the proposed temporary railhead and a permanent maintenance facility near Ashley to facilitate the construction and maintenance of the western leg of the proposed railway.

### **Question: What are your views on the proposed location of the temporary railhead and permanent maintenance facility near Ashley?**

*Please indicate whether or not you support the proposed new infrastructure, together with your reasons.*

## Permanent maintenance facility near Austrey, North Warwickshire

Community Area: LA02 | Birchmoor to Austrey

### Proposed change

The Secretary of State is minded to introduce a permanent infrastructure maintenance base for rail – (IMB-R) near Austrey in North Warwickshire to facilitate night time maintenance of the railway.

### Description of proposed new infrastructure

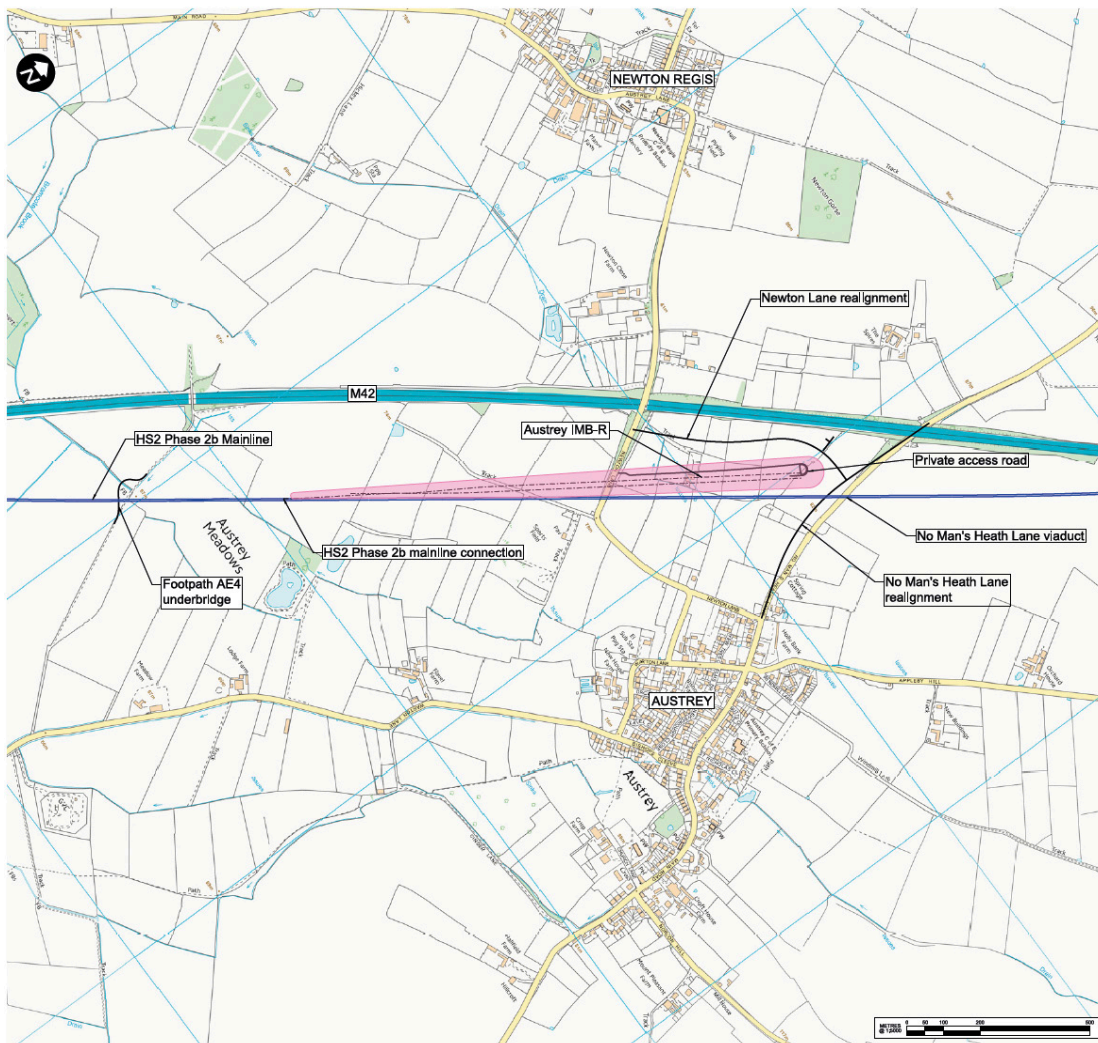


Figure 11: Plan showing the proposed location of permanent IMB-R near Austrey. For more detail see change eight in Volume 2: Map book and visualisations.

### Identification of the proposed site

- 2.2.39 An early version of the Phase 2b scheme included the provision of rail loops for the storage of maintenance trains at Toton. Due to subsequent changes in the layout of the proposed East Midlands Hub Station, these maintenance loops needed to be relocated. It was therefore necessary to find another location for this maintenance facility on the southern section of the eastern leg.
- 2.2.40 HS2 Ltd looked at alternative options for the location of the IMB-R, including two potential sites to the east of junction 12 of the A42, two sites at Austrey, one to the north and one to the south and a site at the proposed Ashby railhead at junction 13 of the A42.
- 2.2.41 The potential sites to the east of junction 12 of the A42 were discounted for a number of reasons, including the need for increased earthworks and associated construction vehicle movements to develop the site. Changes in the horizontal and vertical alignment of the railway would also be required as it headed north between junction 12 and 13 of the A42 to provide the straight track at constant gradient that the maintenance facility requires.
- 2.2.42 The potential site at the proposed Ashby railhead that would be in place during the construction phase of the project would result in changes to the horizontal and vertical alignment of the scheme up to junction 14 of the A42. These alignment changes would be required to again provide a straight length of track at a constant gradient. This option would result in an increase in the volume of earthworks and associated construction vehicle impacts, the permanent loss and severance impacts to Rough Park Ancient Woodland, disturbance to Lount Meadows SSSI and bring the route closer to scheduled monuments at Birch Coppice and Rough Park. This option was therefore also discounted.
- 2.2.43 Of the two options considered at Austrey, an option to the south would have an impact on the Bramcote Brook floodplain, would increase ecological impacts at Bramcote Brook and would result in the HS2 mainline having increased visual impacts due to the need to replace the currently proposed No Man's Heath underbridge with an overbridge.
- 2.2.44 The option of an IMB-R to the north of Austrey would enable the IMB-R to be at the existing ground level with the sidings screened by the HS2 mainline. This option would also make use of land that is currently islanded by the mainline and the A42. No alignment change would be required for the HS2 mainline.
- 2.2.45 Following a detailed assessment of the alternative options, HS2 Ltd identified that the most suitable location for the IMB-R to serve the southern section of the Phase 2b eastern leg would be the proposed site to the north of Austrey.

### Impacts of the proposed site

- 2.2.46 The proposed maintenance facility near Austrey would consist of two 825m sidings, welfare facilities for staff, a storage area, and a car park for 10 vehicles. Lighting would also be required to enable the site to operate safely. The facility would be located in a cutting between the M42 and the proposed HS2 mainline and be approximately 10m lower than the HS2 mainline.
- 2.2.47 The main works associated with constructing the maintenance facility would involve the creation of a flat area next to the proposed HS2 main line on which the sidings and connection to the mainline would be located. Access to the site during operation would be from No Man's Heath Lane.
- 2.2.48 The main impacts of the proposed IMB-R would occur during construction of the maintenance facility and from the use of the permanent land required for the facility, which is currently arable land. However, the land on which the proposed IMB-R would be located is already required for the construction phase of the HS2 mainline. Any additional construction related impacts are likely to be minimal in the context of the construction of the HS2 mainline through the area.
- 2.2.49 As with Phase One and Phase 2a, the Secretary of State expects HS2 Ltd to seek to reduce the operational impacts associated with this kind of infrastructure through mitigation, such as the provision of earthworks screening and planting.

### Why the Secretary of State is minded to make this addition

- 2.2.50 The Secretary of State is minded to introduce a permanent infrastructure maintenance base near Austrey to facilitate the maintenance of the railway in the southern section of the Phase 2b eastern leg when it is operational.

### **Question: What are your views on the proposed location of a maintenance facility near Austrey?**

*Please indicate whether or not you support the proposed new infrastructure, together with your reasons.*



## Temporary construction railhead near Ashby-de-la-Zouch, Leicestershire

Community Area: LA03 | Appleby Parva to Ashby-de-la-Zouch

### Proposed change

The Secretary of State is minded to introduce a temporary construction railhead near junction 13 of the A42 and the existing Leicester to Burton upon Trent rail line, to support the construction of the HS2 railway.

### Description of the proposed new infrastructure

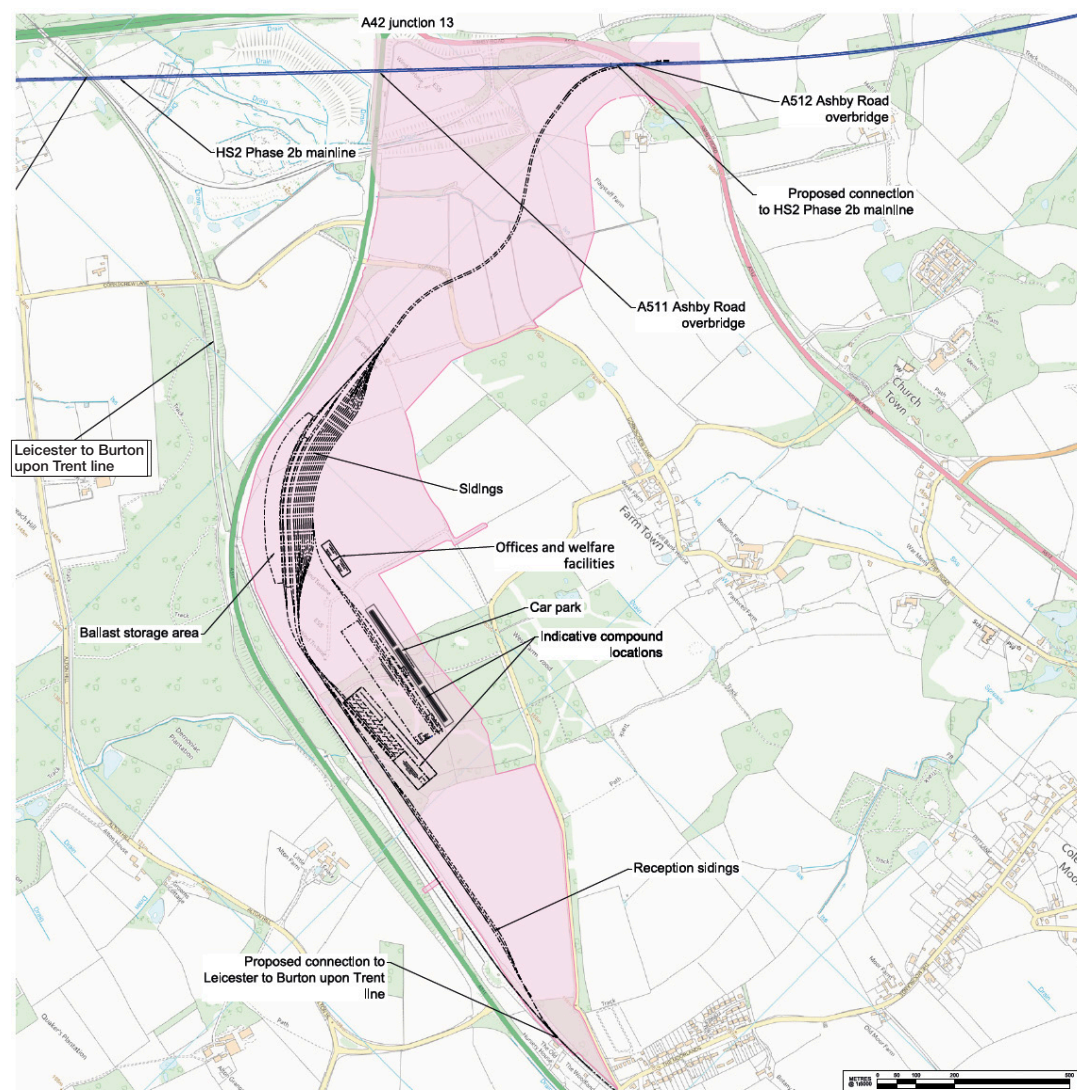


Figure 12: Plan showing the proposed location of temporary railhead near Ashby-de-la-Zouch. For more detail see change nine in Volume 2: Map book and visualisations.



### Identification of the proposed site

- 2.2.51 Further design development has identified the need for temporary railheads across the eastern and western legs at strategic junctures to support the construction of Phase 2b.
- 2.2.52 Based on the strategic considerations and requirements set out on page 46, HS2 Ltd has identified a site near Ashby-de-la-Zouch near junction 13 of the A42 as the most practical location for a temporary railhead to support the construction of the southern section of the eastern leg of Phase 2b.
- 2.2.53 A number of alternative sites were considered. However, the proposed site at Ashby has proximity to the existing Leicester to Burton upon Trent rail line and the strategic road network via junction 13 of the A42, and is strategically located to support the construction of the southern section of the eastern leg of Phase 2b. None of the other sites considered met the requirements for a railhead as well as this site.

### Impacts of the proposed site

- 2.2.54 The proposed railhead near Ashby-de-la-Zouch is a temporary facility that would be required during the construction phase of the project. Where possible, the land would be returned to its existing use after the railway has been built, and some of the area would be used for mitigation planting once Phase 2b is operational.
- 2.2.55 The proposed site would be mainly in a cutting, covering an area of approximately 3.2km between the connection to the existing Leicester to Burton upon Trent line and land to the west of The Moorlands at Sinope.
- 2.2.56 The railhead would provide:
- southbound and northbound connection to the HS2 route;
  - connection to the existing Leicester to Burton upon Trent railway line.
  - storage and workshop areas;
  - car parking, office and welfare facilities;
  - road access from the A511;
  - ten stabling sidings; and
  - ballast storage area.
- 2.2.57 The main impacts associated with the railhead would be as a result of its construction and use to support the construction of the railway.

- 2.2.58 It is anticipated that the site would be required for approximately seven years to support the works to construct the railway in this part of the route. During this period, there would be a temporary loss of arable land and potential severance impacts on Flagstaff Farm and West Farm. It will also require the demolition of one residential property.
- 2.2.59 The village of Sinope is around 300m to the east of the proposed railhead. The residents of Sinope would potentially be affected by construction and operation of the railhead.
- 2.2.60 There would also be impacts on woodland and grassland in the area, including at West Farm Wood; on the setting of Grade II listed Hall Farm and the railhead would cross a tributary of Coleorton Brook.
- 2.2.61 As with the introduction of temporary construction-related infrastructure on Phase One and Phase 2a, HS2 Ltd will seek to reduce the impacts associated with the construction and operation of the railhead including through the use of earthworks screening and planting.

### Why the Secretary of State is minded to make this addition

- 2.2.62 The Secretary of State is minded to include the proposed temporary railhead near Ashby-de-la-Zouch in the Phase 2b scheme to help facilitate the construction of the southern section of the eastern leg of the proposed railway.

### **Question: What are your views on the proposed location of a temporary railhead near Ashby-de-la-Zouch?**

*Please indicate whether or not you support the proposed new infrastructure, together with your reasons.*

## Permanent HS2 train stabling facility at Heaton, Newcastle-upon-Tyne

### Proposed change

The Secretary of State is minded to include a train stabling facility at Heaton, near Newcastle, to store high speed trains serving the north-east of England.

### Description of the proposed new infrastructure



**Figure 13: Plan showing the proposed location of train stabling facility at Heaton.** For more detail see change ten in Volume 2: Map book and visualisations.

2.2.63 The off-route stabling facility will be needed for HS2 in order to store trains overnight that would be serving the north-east of England. Cleaning and light maintenance would also be carried out at the stabling facilities. It is proposed that this facility be located at the existing Network Rail depot at Heaton, which is located 3km north-east of Newcastle Central station.

## Identification of the proposed site

2.2.64 The Tyne and Wear area was broadly identified as the potential location for the off-route eastern leg train stabling facility in Volume 4 of the WDES.

2.2.65 For a site to be potentially suitable, it needed to meet the following requirements:

- a large, flat site;
- as close as feasible to Newcastle Central station, to minimise empty train movements;
- preferably brownfield rather than greenfield site; and
- accessible to workforce and local transport network.

2.2.66 Three potentially suitable locations for the stabling facility were identified. In assessing these locations, HS2 Ltd considered the balance between a range of factors, including operational suitability, impact on the environment and local community, engineering complexity and cost.

2.2.67 One of these potential locations was the former railway facility at Park Lane Gateshead, which is 1km south-east Newcastle Central station. This was discounted because the site was too small to provide all the facilities required without introducing significant temporary and permanent impacts on the existing road network, residential properties and businesses.

2.2.68 Another of the potential locations was at the existing Tyne Yard Depot Gateshead, which is 8km south of Newcastle Central station. This was discounted because of the significant construction works required, disruption to Network Rail, the local road network and utilities during the construction period, in addition to greater operational complexity.

2.2.69 A site at the existing Network Rail depot at Heaton, which is located 3km north-east of Newcastle Central station, was identified as the most suitable option. The site at Heaton would require less construction works than the site at Tyne Yard, would involve a shorter construction programme with less disruption to existing infrastructure and would be cheaper to construct. This site is therefore being proposed for inclusion in the Phase 2b scheme.

## Impacts of the proposed site

2.2.70 The existing depot would be extended and modified so new sidings could be constructed on the eastern part of the depot to provide the capacity required to store up to 11 HS2 units (200m long electric trains). In addition, a welfare facility, car parking and cycle provision and hardstanding for waste bins would be required.



No additional land is required outside the existing depot to develop the proposed stabling facilities for HS2 trains.

- 2.2.71 Some of the existing tracks on the approach to the depot would need to be reconfigured so HS2 trains could access the new sidings. In addition, some of the existing sidings and the internal depot layout would be remodelled to accommodate HS2 trains, including the demolition of an existing train shed.
- 2.2.72 Road access for construction would be through use of the existing site access via Benfields Road.
- 2.2.73 The primary impacts of the proposed site will be associated with the construction of the depot, rather than the operational phase of the railway.
- 2.2.74 There is the potential for minor temporary impacts during construction of the new stabling facility on nearby businesses and properties, as well as on local roads. These are likely to include impacts on air quality (from construction dust and vehicle movements) and visual and noise impacts on nearby sensitive receptors, including Walkergate Park, Benfield School, a number of recreational facilities located at Benfield Business Park, bungalows located on Benfield Road and local allotments.
- 2.2.75 Due to the location of the site, the potential effects from the operation of the proposed stabling facility for HS2 trains are expected to be limited to minor impacts upon nearby businesses, properties and community facilities. Any such effects would, however, be similar to those currently experienced due to the proximity to the existing operational rail depot and railway line.
- 2.2.76 HS2 Ltd is aware of the potential impacts during construction on the Walkergate Park, a specialist neurorehabilitation and neuropsychiatry facility. The Secretary of State expects HS2 Ltd to work closely with the centre to mitigate potential impacts and engage with Nexus and London North East Railways and Northern to understand more about the wider rail industry effects of utilising the site.

## Why the Secretary of State is minded to make this addition

- 2.2.77 The Secretary of State is minded to include the proposed train stabling facility at Heaton to provide overnight storage for HS2 trains serving the eastern leg of the proposed railway.

### **Question: What are your views on the proposal to include a train stabling facility at Heaton?**

*Please indicate whether or not you support the proposed new infrastructure, together with your reasons.*



## 2.3 New scope

2.3.1 This section of the consultation document covers the following proposed changes:

Proposed new scope	Page number
Passive provision for two junctions at High Legh	61

## Passive provision for two junctions at High Legh, Cheshire

Community areas: MA03 | Pickmere to Agden and Hulseheath and MA06 | Hulseheath to Manchester Airport

### Proposed change

**The Secretary of State is minded to include passive provision for two future grade separated junctions in the HS2 design: one to allow the future use of the HS2 line into Manchester as part of Northern Powerhouse Rail (NPR), for services between Manchester, Warrington and Liverpool; and the second to also allow HS2 services between London and Liverpool to use future NPR infrastructure. Decisions on future service patterns and NPR infrastructure have not yet been made.**

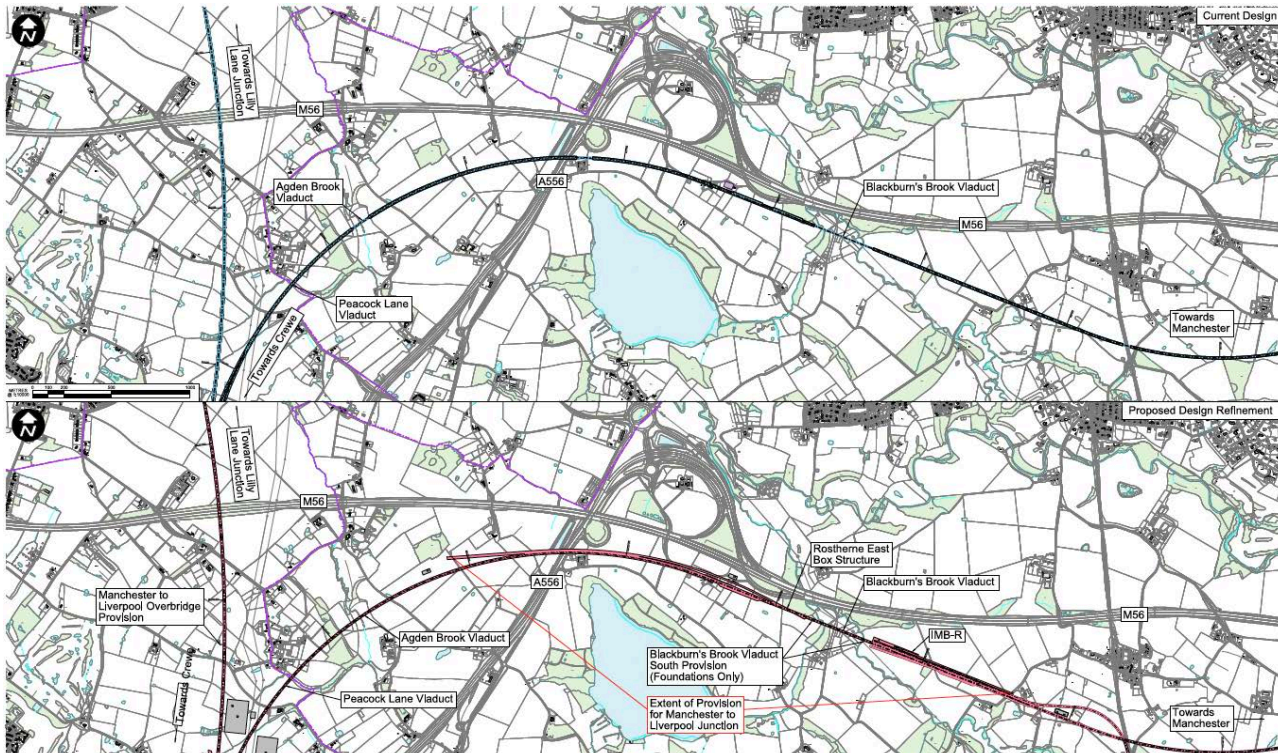
### Introduction

- 2.3.2 As set out in the introduction (see paragraphs 1.21–1.32 above), in April 2018 TfN consulted on a Draft Strategic Transport Plan which was formally adopted by TfN in February 2019 and includes their vision for NPR. The Government is consulting on junctions with HS2 to allow future NPR lines to connect Manchester to Liverpool and London to Liverpool.
- 2.3.3 In order to allow these junctions to be constructed later without disrupting HS2 services once the railway is operational, passive provision needs to be included in the Phase 2b hybrid Bill.
- 2.3.4 The Secretary of State has decided to consult on the passive provision for these junctions now to get feedback as early as possible on the emerging designs and to ensure they are included in the Phase 2b hybrid Bill.

### Description of the proposed new infrastructure

- 2.3.5 The junctions proposed here have been designed as ‘passive provision’. Passive provision refers to the minimum works to be included in the Phase 2b hybrid Bill now, such that, as and when future NPR lines are connected to them, the works to deliver the NPR lines will cause minimum disruption to the operation of HS2.
- 2.3.6 Passive provision includes the civil engineering and earthworks within approximately 50m of HS2 infrastructure required to create a junction in future with NPR lines. As passive provision for these future junctions is being delivered under the Phase 2b hybrid Bill, they have been designed to HS2 Ltd’s technical standards.

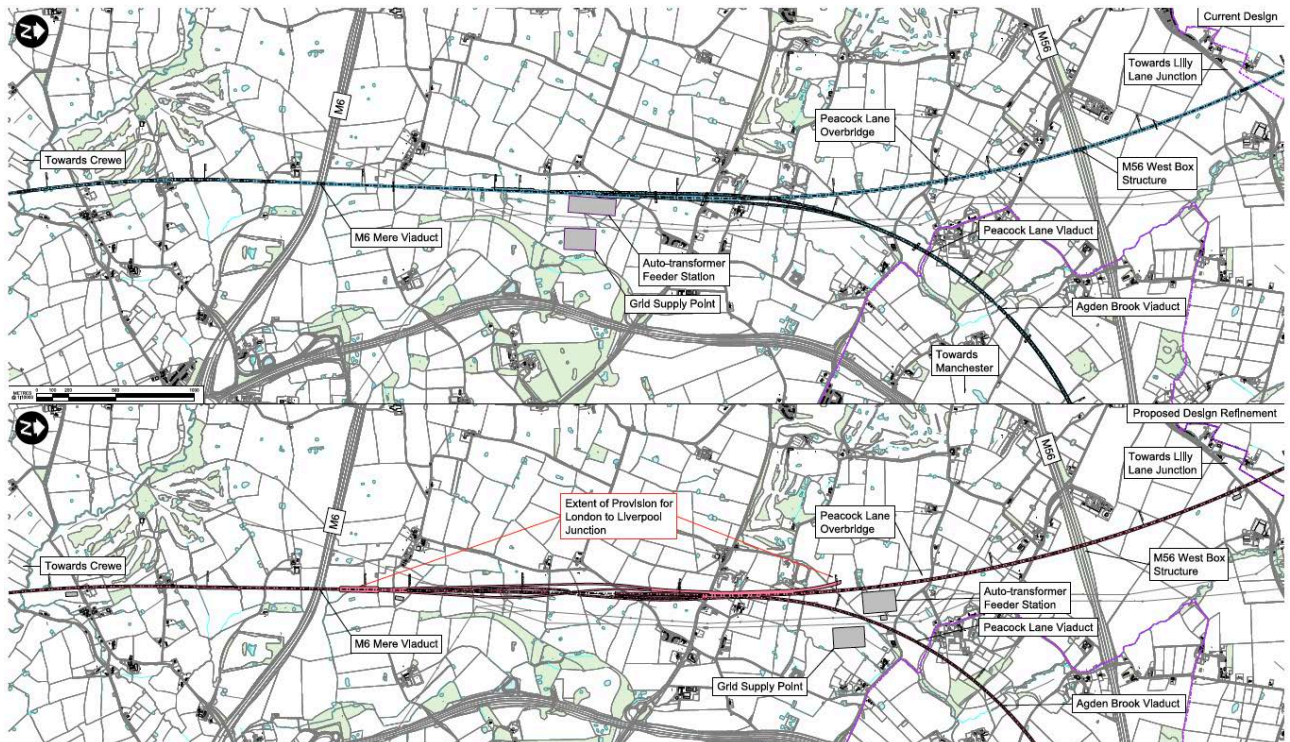
### 2.3.7 The details of the proposed changes are:



**Figure 14: Passive provision for the Manchester to Liverpool junction. For more detail see change 11 in Volume 2: Map book and visualisations.**

- Manchester to Liverpool junction:** it is proposed that the earthworks and civil engineering structures required to support a junction with NPR are added to the HS2 Manchester Spur in the vicinity of Ashley and extended west, under the A556 to a point near Millington Lane. This also requires an overbridge to be constructed across the HS2 mainline near Agden Lane. Under this proposal, the HS2 Manchester Spur remains in the same location, while a future Manchester to Liverpool line would cross over the Manchester Spur near Birkin Brook at a height of approximately 14m.





**Figure 15: Passive provision for the London to Liverpool junction. For more detail see change 11 in Volume 2: Map book and visualisations.**

- London to Liverpool junction:** it is proposed that the existing cutting south of Hoo Green is widened by up to 25m to allow two additional tracks to be laid at a later date for a potential new London to Liverpool line. This would also require the HS2 mainline south of the M6 to be moved by up to 70m eastwards. Earthworks and civil engineering structures would be provided to support the London to Liverpool line to cross over the HS2 mainline and HS2 Spur near Hoo Green Lane. This would increase the height of infrastructure in this area by up to 15m.

- 2.3.8 In addition to the works directly associated with providing passive provision for NPR services, the autotransformer feeder station (ATFS) and grid supply point would be moved from the sites shown in the current design. These pieces of infrastructure are required to provide power to the railway. In the current design the ATFS is located south of Hoo Green and the A50. The proposed relocation would place the ATFS further north between the HS2 mainline and the HS2 Spur towards Manchester. The grid supply point would be located to the east of the HS2 Manchester Spur line.
- 2.3.9 The Government is yet to make decisions on the NPR lines that will connect to these junctions. However, it is necessary to make changes to the design of HS2 for these junctions so they can be included in the Phase 2b hybrid Bill and avoid precluding NPR lines joining HS2 in future. The designs for these junctions do not pre-determine future choices the Government will make about the NPR network, for instance on how it could connect Manchester, Liverpool and Warrington.

## Identification of the proposed site

- 2.3.10 One of NPR's key strategic aspirations is to provide improved connectivity between Liverpool and Manchester Piccadilly via Manchester Airport. Using spare capacity on the HS2 line into Manchester would be vastly preferable on cost and impact grounds to seeking to build a further new approach. To do this, a future NPR route to Liverpool would need to connect with HS2 at a point west of Manchester Airport station. TfN has provided advice to the Government, in line with their statutory duty to advise the Secretary of State on transport plans for the North of England, that any potential new NPR services between Liverpool and Manchester Piccadilly should use as much of HS2 as possible, including the proposed HS2 tunnel into Manchester.
- 2.3.11 Separately, DfT considers that if there were a new NPR route to be constructed that linked Manchester and Liverpool as set out above, then there would also be merit in creating a connection to that new route for use by London services.
- 2.3.12 In line with the emerging vision for NPR as set out in TfN's Strategic Transport Plan, the Government has asked HS2 Ltd to examine options for connections between the planned HS2 line and any potential new route towards Liverpool that might be constructed. HS2 Ltd has recommended to DfT and TfN that the proposals described in this chapter are the most appropriate sites for the junctions between HS2 and a potential future NPR route to Liverpool. The selected locations have the benefit of allowing any future NPR route to also serve Warrington, but without at this stage prescribing how that is done.

## Impacts of the proposed change

- 2.3.13 The inclusion of passive provision for two new junctions would cause new and different impacts in the area. However, incorporating these into the Phase 2b design now would reduce the potential impacts and cost of creating the NPR network at a future date.
- 2.3.14 The inclusion of these changes would:
- modify and add to permanent structures in the areas around the junctions, specifically earthworks, overbridges and structures to support future lines, leading to increased landscape and visual impacts;
  - require more and different land during the construction and operational phases of HS2, including some woodland;
  - lead to an increase in construction vehicles using roads in the vicinity of the junctions in order to build this additional infrastructure, with potentially increased air quality, sound, noise and vibration impacts; and



- with passive provision for a future Manchester to Liverpool line, construction phase impacts are brought closer to Rostherne Mere SSSI and RAMSAR site.

2.3.15 The Secretary of State expects HS2 Ltd to continue to work to reduce these impacts as far as reasonably practicable and seek further ways of managing the construction phase to minimise disruption to local communities.

2.3.16 Although the extent of the works provided in the hybrid Bill for these junctions only include passive provision, the Secretary of State understands that the alignment of future lines to Liverpool in the vicinity of High Legh will be a particular concern for local residents. If a decision is taken in future to build a new line between Liverpool and Manchester, this would be subject to further consultation. For more information on the support available for property owners affected by the passive provision for the potential NPR junctions, please see paragraph 1.33–1.36.

## Why the Secretary of State is minded to make this change

2.3.17 The Secretary of State has received advice from TfN on the need to consider a new junction from HS2 that could facilitate future development of services between Manchester, Manchester Airport, Warrington and Liverpool. The Secretary of State accepts that advice from TfN, and also considers that a second junction should be provided that would allow for HS2 London-Liverpool services to also make use of the NPR route.

2.3.18 The provision for potential connections between the planned HS2 network and proposed NPR network at this stage in the design process is more efficient and cost effective and will have a reduced environmental impact than incorporating such changes at a later date.

2.3.19 The Secretary of State is minded to include passive provision for these junctions in the Phase 2b hybrid Bill as:

- this provides the earliest possible opportunity for the public to comment on the emerging design for these connections;
- by including this in the hybrid Bill, this reduces the risk of disruption to HS2 services that could be caused by the construction and operation of NPR in future; and
- it is more cost efficient to deliver the interfaces between HS2 and possible future lines now than have to adapt HS2 infrastructure that has already been constructed and is in use.

2.3.20 The Secretary of State is therefore minded to include passive provision for the proposed Manchester to Liverpool and London to Liverpool junctions in the design as it provides future proofing for NPR and HS2 services.

**Question: What are your views on the proposals to include passive provision for Manchester to Liverpool and London to Liverpool junctions near High Legh?**

*Please indicate whether or not you support the proposed change, together with your reasons.*

## 3. How to respond and next steps

### How to respond

- 3.1.1 The deadline for responding to the 2019 Design Refinement Consultation is 11:45pm on 6 September 2019. Please ensure that you send your response before that date to ensure that it is included in our analysis and consideration.
- 3.1.2 Email and online responses can be submitted until 11:45pm on the final day of the consultation. Postal responses must be posted on or before the final day of the consultation.
- 3.1.3 Please only use the channels listed below when responding to this consultation. We cannot guarantee that responses sent to any other addresses will be considered as part of this consultation.
- 3.1.4 You can access the consultation documents and the online response form at: [www.gov.uk/government/consultations/hs2-phase-2b-design-refinement-consultation](http://www.gov.uk/government/consultations/hs2-phase-2b-design-refinement-consultation).
- 3.1.5 You can respond to this consultation in the following ways:

**Online:** You can respond to the consultation at <https://ipsos.uk/designrefinement2b>

**Email:** You can email your response to [designrefinement2b@ipsos-mori.com](mailto:designrefinement2b@ipsos-mori.com)

**Post:** You can post your response to us using  
FREEPOST HS2 PHASE 2B DESIGN REFINEMENT.

Please note that you do not need include any more information on the envelope than the full FREEPOST address on a single line. No stamp is required.

### Helpdesk

- 3.1.6 If you have any questions about the information in this document or about the consultation, please get in touch via the HS2 Helpdesk on 08081 434 434 or via [hs2enquiries@hs2.org.uk](mailto:hs2enquiries@hs2.org.uk). You can also request a copy of this consultation document in large print, braille or audio from the Helpdesk.
- 3.1.7 Please do not send your consultation to Helpdesk. Instead use the channels set out above.

## Events

3.1.8 We are holding a series of information events in June and July 2019 to support the consultation. Members of the HS2 team will be available at these events to help answer questions about the proposed changes to the scheme and Phase 2b in general.

3.1.9 A full schedule of events can be found at [www.hs2.org.uk/phase2b](http://www.hs2.org.uk/phase2b)

## What will happen next?

3.1.10 Following the close of consultation on 6 September 2019, the feedback received will be analysed by Ipsos MORI who will produce an independent report on the findings of the consultation.

3.1.11 On the basis of this report, HS2 Ltd will provide advice to the Secretary of State who will then make a decision about whether to include each proposal in Phase 2b. This decision will be made with consideration to both HS2 Ltd's advice and the Ipsos MORI report.

3.1.12 Subject to the Secretary of State's decision to include each change in the scheme submitted as part of the hybrid Bill, HS2 Ltd will use feedback to the consultation to inform the evolving design of each element.

3.1.13 There may be additional changes to the scheme that Secretary of State decides to consult on before the submission of the hybrid Bill. Such a consultation would be carried out and promoted in a similar manner to this consultation.

3.1.14 In addition, HS2 Ltd will update stakeholders and communities about the design included in the Bill. The submission of the hybrid Bill to Parliament will start a further stage of consultation, carried out by Parliament, on the Environmental Statement for Phase 2b.

## Confidentiality and data protection

- 3.1.15 Information provided in response to this consultation, including personal information, may be subject to publication or disclosure in accordance with the access to information regimes. These are primarily the Freedom of Information Act 2000 (FOIA), the Environmental Information Regulations (EIR) 2004, the Data Protection Act (DPA) 2018, and the General Data Protection Regulation (GDPR) 2016.
- 3.1.16 Please be aware that, under the FOIA and the EIR, there is a statutory Code of Practice with which public authorities must comply and which deals with, amongst other things, obligations of confidentiality.
- 3.1.17 In view of this, if you wish your response to be considered in confidence, it would be helpful if you could explain to us why you regard the information you have provided as confidential. Space is provided on the response form for this consultation to do this.
- 3.1.18 If we receive a request for disclosure of the information we will take full account of your explanation, but we cannot give an assurance that confidentiality can be maintained in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not, in itself, be regarded as binding on the Department for Transport or HS2 Ltd.
- 3.1.19 The Department for Transport, HS2 Ltd and Ipsos MORI will process your personal data in accordance with the DPA 2018 and GDPR. We may share your personal information with our partner agencies and government, when doing so enables us to fully consider your response. If you change your mind about us using your personal information you have a right to have the relevant information deleted. If this is the case please email [hs2dataprotection@hs2.org.uk](mailto:hs2dataprotection@hs2.org.uk).
- 3.1.20 To view HS2 Ltd's full privacy notice please visit [www.hs2.org.uk/privacy-notice](http://www.hs2.org.uk/privacy-notice).



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