



HIGH SPEED TWO

PHASE 2a INFORMATION PAPER

A1: DEVELOPMENT OF THE PROPOSED SCHEME

This paper outlines the development of the Proposed Scheme since 2012.

It will be of particular interest to those potentially affected by the Government's proposals for high speed rail.

This paper was prepared in relation to the promotion of the High Speed Rail (West Midlands-Crewe) Bill which is now enacted. It was finalised at Royal Assent and no further changes will be made.

If you have any queries about this paper or about how it might apply to you, please contact the HS2 Helpdesk in the first instance.

The Helpdesk can be contacted:

by email: HS2enquiries@hs2.org.uk

by phone (24hrs): 08081 434 434
08081 456 472 (minicom)

or by post: High Speed Two (HS2) Limited
2 Snowhill, Queensway
Birmingham
B4 6GA

Version 1.1

Last updated: 11 February 2021

A1: DEVELOPMENT OF THE PROPOSED SCHEME

1. Introduction

- 1.1. High Speed Two (HS2) is the Government's proposal for a new, high speed north-south railway. The proposal is being taken forward in phases: Phase One will connect London with Birmingham and the West Midlands. Phase 2a will extend the route to Crewe. Phase 2b will extend the route to Manchester, Leeds and beyond. The construction and operation of Phase One of HS2 is authorised by the High Speed Rail (London – West Midlands) Act 2017.
- 1.2. HS2 Ltd is the non-departmental public body responsible for developing and promoting these proposals. The company works to a Development Agreement made with the Secretary of State for Transport.
- 1.3. In July 2017, the Government introduced a hybrid Bill¹ to Parliament to seek powers for the construction and operation of Phase 2a of HS2 (the Proposed Scheme). The Proposed Scheme is a railway starting at Fradley at its southern end. At the northern end it connects with the West Coast Main Line (WCML) south of Crewe to allow HS2 services to join the WCML and call at Crewe Station. North of this junction with the WCML, the Proposed Scheme continues to a tunnel portal south of Crewe.
- 1.4. The work to produce the Bill includes an Environmental Impact Assessment (EIA), the results of which are reported in an Environmental Statement (ES) submitted alongside the Bill. The Secretary of State has also published draft Environmental Minimum Requirements (EMRs)², which set out the environmental and sustainability commitments that will be observed in the construction of the Proposed Scheme.
- 1.5. The Secretary of State for Transport is the Promoter of the Bill through Parliament. The Promoter will also appoint a body responsible for delivering the Proposed Scheme under the powers granted by the Bill. This body is known as the 'nominated undertaker'. The nominated undertaker will be bound by the obligations contained in the Bill and the policies established in the EMRs. There may be more than one nominated undertaker.
- 1.6. These information papers have been produced to explain the commitments made in the Bill and the EMRs and how they will be applied to the design and construction of the Proposed Scheme. They also provide information about the Proposed Scheme itself, the powers contained in the Bill and how the Proposed Scheme have been reached.

¹ The High Speed Rail (West Midlands – Crewe) Bill, hereafter 'the Bill'.

² For more information on the EMRs, please see Information Paper E1: Control of Environmental Impacts.

2. Overview

- 2.1. This Information Paper describes the preparation of proposals for Phase Two of HS2 in 2012, of subsequent proposals for the acceleration of Phase 2a and the development of the Proposed Scheme.

3. Evolution of the Proposed Scheme

- 3.1. The key milestones in the evolution of the Proposed Scheme have been as follows³:
 - January 2009: HS2 Ltd is established. The company has a remit to provide advice to Government on options for a rail route from London to the West Midlands, stations and links to High Speed One⁴ and the existing rail network. HS2 Ltd was also asked to examine the potential for extensions to Greater Manchester, West Yorkshire, the North East and Scotland;
 - January 2012: the Secretary of State for Transport published the Command Paper "High Speed Rail: Investing in Britain's Future – Decisions and Next Steps", together with supporting documents. The Command Paper confirmed the Government's intention to develop a Y network. The Y network was to be brought forward in two phases, with powers sought initially for a London-West Midlands high speed line;
 - January 2013: Publication of "High Speed Rail: Investing in Britain's Future Phase Two - the Route to Leeds, Manchester and Beyond"⁵. The Secretary of State for Transport also announced the Government's intention to proceed with the planning and design of Phase Two, and published initial preferred routes for Leeds and Manchester. Published alongside this was the initial preferred scheme sustainability summary, the initial preferred route plan and profile maps. Also published were HS2 Ltd's March 2012 advice to Government⁶:
 - options for Phase Two of the high speed network;
 - options for Phase Two of the high speed network appraisal of sustainability;
 - record of stakeholder engagement for Phase Two of the High Speed Rail network;

³ For a chronological summary of the options considered for each element of the Proposed Scheme and the reasons for the choice, see HS2 London-West Midlands Environmental Statement, Volume 5 Alternatives Report (CT-002-000), HS2 Ltd. November 2013, which also includes references to the source documents.

⁴ The railway between St Pancras in London and the Channel Tunnel. It connects with the international high speed routes between London and Paris, and London and Brussels.

⁵ Department for Transport (2013), *High speed rail: investing in Britain's future phase two - the route to Leeds, Manchester and beyond*, <https://www.gov.uk/government/publications/high-speed-rail-investing-in-britains-future-phase-two-the-route-to-leeds-manchester-and-beyond>

⁶ Department for Transport (2013), *HS2 Phase Two initial preferences* <https://www.gov.uk/government/collections/hs2-phase-two-initial-preferred-route>

- HS2 cost and risk model report;
 - options for phase two of the high speed rail network approach to design;
 - three Phase Two engineering options reports (West Midlands to Manchester, West Midlands to Leeds and Heathrow); and
 - selecting an initial preferred scheme for HS2 Phase Two refinement work since March 2012.
- July 2013: Launch of public consultation on the proposed route for Phase Two detailing the route from the West Midlands to Manchester, Leeds and beyond. Consultation documents included supporting technical information (including maps) the Sustainability Statement and quick reference factsheets⁷;
 - September 2013: HS2 Ltd published an analysis of the potential scale, range and distribution of regional economic impacts associated with the substantial improvements to the rail network brought about by HS2 (both Phase One and Phase Two) and the use of freed-up capacity on the conventional rail network⁸;
 - October 2013: Publication of the Economic Case for HS2 and Strategic Case for HS2;
 - November 2013: The Secretary of State for Transport announced that Sir David Higgins had been tasked with reporting on how to reduce the cost of HS2; how its benefits could be delivered earlier and at a lower cost; and how to ensure that HS2 delivers benefits like jobs and growth⁹;
 - March 2014: Publication of “HS2 Plus” – a report by David Higgins, which recommended the accelerated delivery of the Phase 2a route to Crewe¹⁰;
 - October 2014: Publication of “Rebalancing Britain: From HS2 towards a national transport strategy”, a second report by the Chairman of HS2 Ltd Sir David Higgins¹¹. This highlighted the need for greater consideration of transport connectivity across the north of England. It described HS2 as a new spine for the national rail network, and as an important catalyst for a national transport strategy;
 - November 2015: A number of reports and documents were published, including:

⁷ HS2 Ltd (2013), Phase Two Route Consultation, <http://webarchive.nationalarchives.gov.uk/20141027142236/http://www.hs2.org.uk/phase-two/route-consultation/document-library>

⁸ HS2 Ltd (2013), *HS2 Regional Economic Impacts*.

⁹ Department for Transport (2013) <https://www.gov.uk/government/news/sir-david-higgins-to-drive-down-cost-of-hs2>

¹⁰ HS2 Ltd (2014), HS2 Plus – A report by David Higgins. <https://www.gov.uk/government/publications/hs2-plus-a-report-by-david-higgins>

¹¹

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

- Strategic Case and Economic Case for HS2 Phase 2a, as part of the Strategic Outline Business Case;
 - High Speed Two: East and West, The next steps to Crewe and beyond paper. This included the decision on the Phase 2a route, following consideration by Government of the responses to consultation;
 - HS2 Phase 2a Strategic Outline Business Case documents Strategic Case, Economic Case and Rail Alternatives to Phase 2a¹²;
 - High Speed Rail: Investing in Britain's future. Consultation on the route from the West Midlands to Manchester, Leeds and beyond¹³ consultation response analysis report by Ipsos MORI. This reported on the outcome of the consultation on the proposed route for Phase Two;
 - HS2 Phase Two Response to HS2 Phase Two Consultation: Appraisal of Sustainability (Question 7). This report provided an HS2 Ltd response to feedback from question 7 of the Phase Two consultation, regarding the Appraisal of Sustainability; and
 - High Speed Rail: Preferred Route to Crewe. Sustainability Report. Phase Two Post-Consultation Update: West Midlands to Crewe.
- Together, these documents formed the basis of the route announcement of the Proposed Scheme.
 - November 2015: Launch of the High Speed Rail (West Midlands - Crewe) Property Consultation;
 - January 2016: Publication of the remaining documents that form part of the Phase 2a Strategic Outline Business Case: Financial Case, Management Case and Commercial Case.
 - March 2016: Publication of the draft HS2 Phase Two: West Midlands to Crewe EIA and EQIA Scope and Methodology Reports for consultation.
 - September 2016: Launch of the HS2 Phase 2a: West Midlands to Crewe Design Refinement Consultation and publication of several reports and documents, including:
 - the revised HS2 Phase Two: West Midlands to Crewe EIA Scope and Methodology Report; and
 - the working draft EIA and EQIA Reports for HS2 Phase 2a: West Midlands to Crewe, for consultation.

¹² Department for Transport (2015), Phase 2a publications. <https://www.gov.uk/government/collections/hs2-phase-two-from-the-west-midlands-to-leeds-and-manchester#department-for-transport-phase-2a-publications>

¹³ Ipsos MORI (2014), *High Speed Rail: Investing in Britain's future. Consultation on the route from the West Midlands to Manchester, Leeds and beyond.* <https://www.gov.uk/government/consultations/hs2-phase-two-proposed-line-of-route-from-west-midlands-to-manchester-and-leeds>

- July 2017: Deposit of the Bill, along with the ES and associated documents, and publication of the outcome of the HS2 Phase 2a: West Midlands to Crewe Design Refinement Consultation.
- 3.2. At each stage in the development of the Proposed Scheme the design, cost, construction and operational feasibility have been examined in more detail, in parallel with the development of the economic and environmental appraisals and preparation of mitigation packages. As the work has progressed, stakeholder and community consultation has increased. There have also been continuous discussions with public and private agencies and affected property owners on topics that affect them directly. Where feasible, comments received during these engagement activities have resulted in changes being made to the proposals.

4. Requirements, objectives and selection criteria

- 4.1. The Proposed Scheme has been developed in pursuit of Government's objectives for rail capacity, connectivity and sustainability. As set out in the Strategic Case¹⁴ the objectives for HS2 are:

"to provide sufficient capacity to meet long term demand, and to improve resilience and reliability across the network;

to improve connectivity by delivering better journey times and making travel easier."

"Any solution must:

- minimise disruption to the existing network;
- use proven technology that we know can deliver the desired results;
- be affordable and represent good value to the taxpayer;
- minimise negative impacts on local communities and the environment."

Option selection criteria

- 4.2. HS2 Ltd has been preparing and refining proposals for a new high speed line from London to the West Midlands and the North since the beginning of 2009. At the same time the Government has been considering and comparing the emerging HS2 network with the strategic alternatives. In both strands of work a wide range of options were studied, and these were assessed against selection criteria derived from three sources:

- the Government's transport and economic objectives to provide for long-term demand;

¹⁴ The Strategic Case for HS2, DfT, October 2013

- The Treasury Green Book requirements to ensure that public funds are spent on activities that provide the greatest benefits to society, and that they are spent in the most efficient way¹⁵; and
 - national sustainability objectives and environmental policies and requirements.
- 4.3. For the more specific selection of options for the route, the appraisal criteria were grouped under eleven headings:
- strategic fit;
 - construction feasibility;
 - operational feasibility – trains (HS2 and Network Rail);
 - operational feasibility – operations (stations, depots etc.);
 - operational feasibility – passengers;
 - demand;
 - costs;
 - environment (using EIA topic areas);
 - safety;
 - commitments; and
 - development opportunities.

5. Remit and approach

- 5.1. The original remit to HS2 Ltd for Phase Two was set out in a letter from the Secretary of State for Transport on 11 January 2012, which stated:

"Hs2 Ltd should continue its current work on developing routes from the West Midlands to Leeds, with a connection to the East Coast Main Line (ECML), and to Manchester, with a connection onto the West Coast Main Line (WCML), and a spur to Heathrow. It should report to me on this work, to include appropriate engineering designs and sustainability appraisal and the implications for the whole Y network. Hs2 Ltd should prepare materials and provide advice to develop and inform my intended informal consultations necessary to develop this phase of the Government's proposals for high speed rail."

¹⁵ HM Treasury (2003), *The Green Book*. Appraisal and Evaluation in Central Government, Her Majesty's Stationery Office, London.

5.2. The advice in response to this remit was set out in the Options for Phase Two of the high speed rail network report¹⁶. This report sought to meet the remit by setting out:

- station options for each of the remitted cities and regions and Heathrow;
- consideration of providing access to the major airports in these regions with Manchester Airport the most significant consideration;
- line of route options from the West Midlands to Manchester and from the West Midlands to Leeds and a spur from the Phase One route to Heathrow;
- connections to the WCML and ECML including how Scotland will be served from the Phase Two connections;
- options for serving cities and regions off the base high speed rail network;
- proposed locations for train maintenance facilities and stabling;
- appropriate engineering, sustainability, economic and social appraisals; and
- a re-confirmation of the technical specification for high speed rail.

6. Technical specifications and train speeds

- 6.1. HS2 Ltd developed a technical specification for the design and operation of the railway based on factors such as ensuring a safe and secure network and compliance with European and UK national railway standards. These technical specifications were reviewed as the design developed. The most significant element of the technical specification that affects the choice of the HS2 route is the maximum design speed, as any curves in the line need to be shallower for higher speeds and this requirement could reduce the scope for modifying the alignment locally, for instance to avoid environmentally sensitive areas.
- 6.2. HS2 has been designed for speeds of up to 250mph (400kph). When it comes into operation, the trains will run at speeds of up to 225mph (360kph), a speed similar to routes being developed elsewhere in Europe for which there is proven technology.

7. Development of Phase Two

- 7.1. Following the remit for Phase Two in 2012, the section of HS2 now referred to as Phase 2a was developed as part of the wider options for a second phase of HS2.
- 7.2. The route proposals from the West Midlands to Manchester included:
- A station to serve Manchester City Centre;

¹⁶ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/68965/options-for-phase-two-of-the-high-speed-rail-network.pdf

- An interchange location providing access to the major airports in this region;
 - A connection to the WCML at Golborne; and
 - provision of Infrastructure Maintenance and Rolling Stock Depots.
- 7.3. Early designs of the line of route in this area suggested that the best corridors for the route between Lichfield and Manchester were those that passed Crewe. This was for a number of reasons such as regional connectivity, shorter journey times to key markets in Manchester and the North, and fewer sustainability impacts (demolitions and engineering complexities).
- 7.4. Figure 1 below shows the range of route corridors that were considered for the route between the West Midlands and Manchester. These route corridors included those past Crewe, routes through Stoke-on-Trent and routes through the Peak District/Churnet Valley. Route corridors through Stoke-on-Trent and the Peak District were dismissed for reasons including a reduction in benefits, less regional connectivity, sustainability impacts and engineering challenges.
- 7.5. Those routes coloured and listed in geographical groupings in Figure 1 were not short listed for further development. Those shown in grey and listed as “All Other Routes” were taken forward to a shortlisting stage.

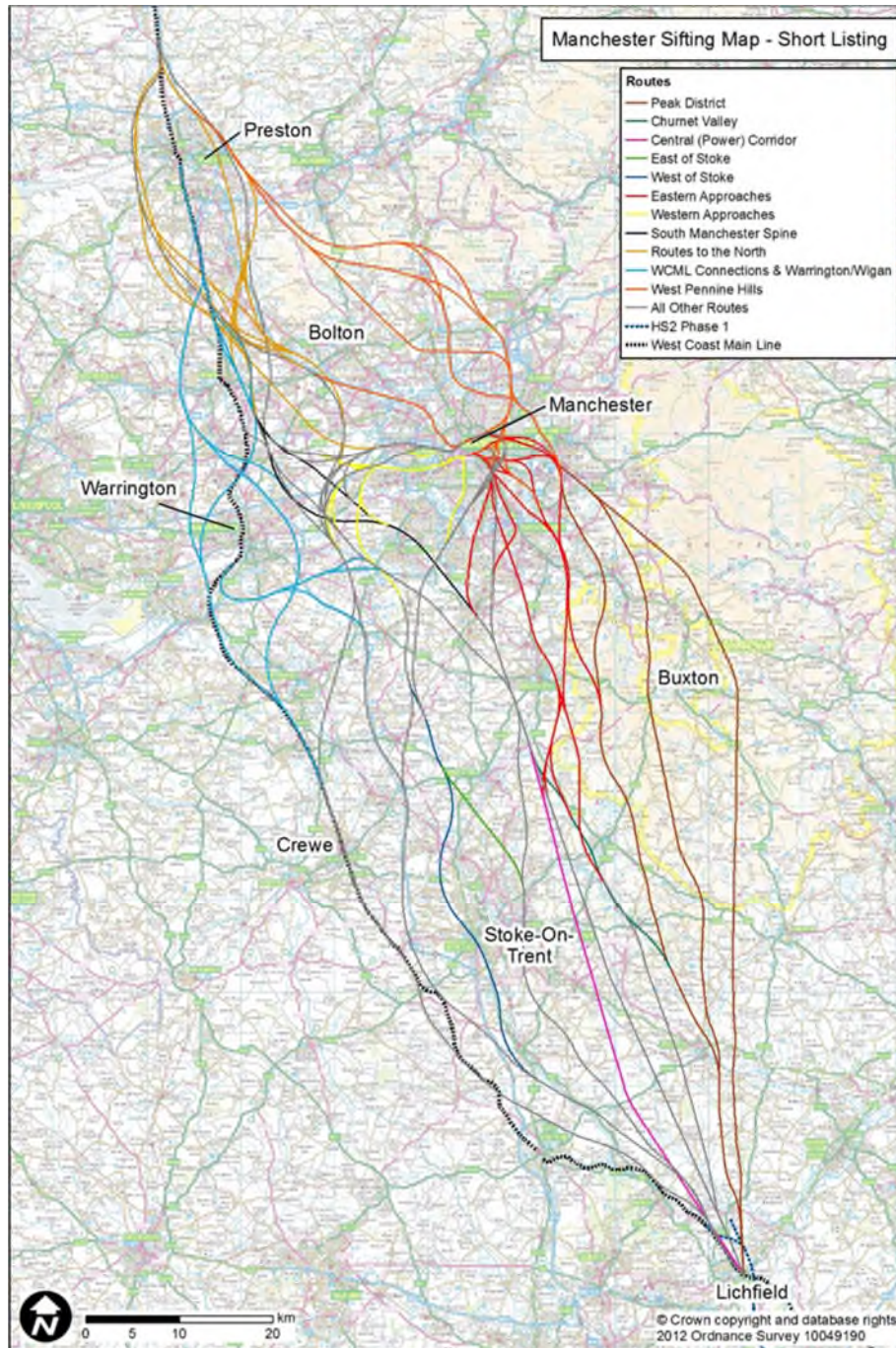


Figure 1 Route options between West Midlands and Manchester

- 7.6. The route corridors for the Phase Two route in this area were refined further into two main corridors between Lichfield and Newcastle-under-Lyme, and three main corridors between Newcastle-under-Lyme and Manchester. In addition, consideration was given to the requirement to access stations in Manchester city centre at the northern end of the route alignments. Figure 2 below shows the main route corridor options north and south of Newcastle-under-Lyme, and the options for accessing Manchester city centre from these routes.

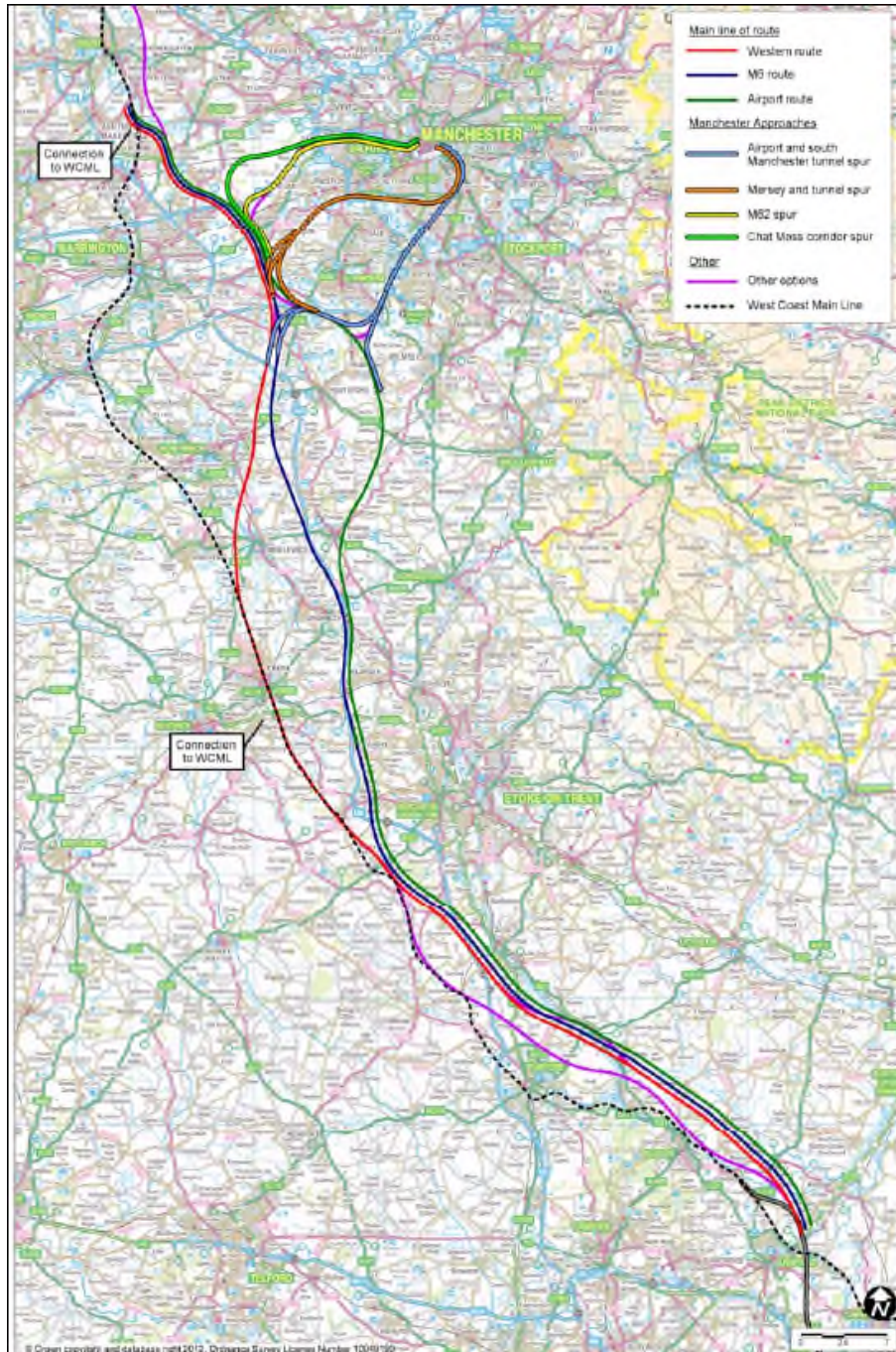


Figure 2 Options for route between West Midlands and Manchester

- 7.7. The two main route alignments between Lichfield and Newcastle-under-Lyme were referred to as follows:
- Northern option with variant: This route would head north-west from the junction with Phase One, passing Rugeley and to the south of Weston, before heading to the west of Newcastle-under-Lyme. The variant would skirt to the south of Weston.

- Southern option: This route would head north west from the junction with Phase One, passing Rugeley and to the north of Cannock Chase and north of Stafford, before heading to the north of Newcastle-under-Lyme.
- 7.8. These three route alignments from Newcastle-under-Lyme to Manchester were referred to as follows:
- Western Route: This followed the WCML alignment towards Crewe, passing under the town in a tunnel, before heading north. The route would then pass across the Cheshire Plain to the south of Manchester. It would also pass to the west of Manchester and towards a connection with the WCML at Goldborne.
 - M6 route: This route would continue along the M6 corridor, passing to the west of Knutsford before connecting to a station in Manchester and the WCML west of Manchester.
 - Airport route: This route would also continue along the M6 corridor, passing to the east of Knutsford, and to the south west of the Airport, before joining the path of the M6 route to the south west of Manchester.
- 7.9. Following this work, HS2 Ltd recommended that a combination of the northern option between Lichfield and Newcastle-under-Lyme and from there to Crewe and on to Golborne using the Western Route (connecting to Crewe station) would offer a combination of lower costs, similar sustainability performance and scope to serve wider markets.
- 7.10. The full detail on the route corridors and alignments considered is set out in the 2012 report "Options for Phase Two of the high speed rail network"¹⁷.
- 7.11. Following the advice given by HS2 Ltd to the Secretary of State on the route options outlined above, a decision was taken on the alignment of the route. The Preferred Route between the West Midlands and Manchester was announced by the Secretary of State, and a consultation was undertaken by Hs2 Ltd in 2013 to ensure the public were given the opportunity to share their views on the route. Figure 3 below shows the line of route as consulted on.

¹⁷ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/68965/options-for-phase-two-of-the-high-speed-rail-network.pdf

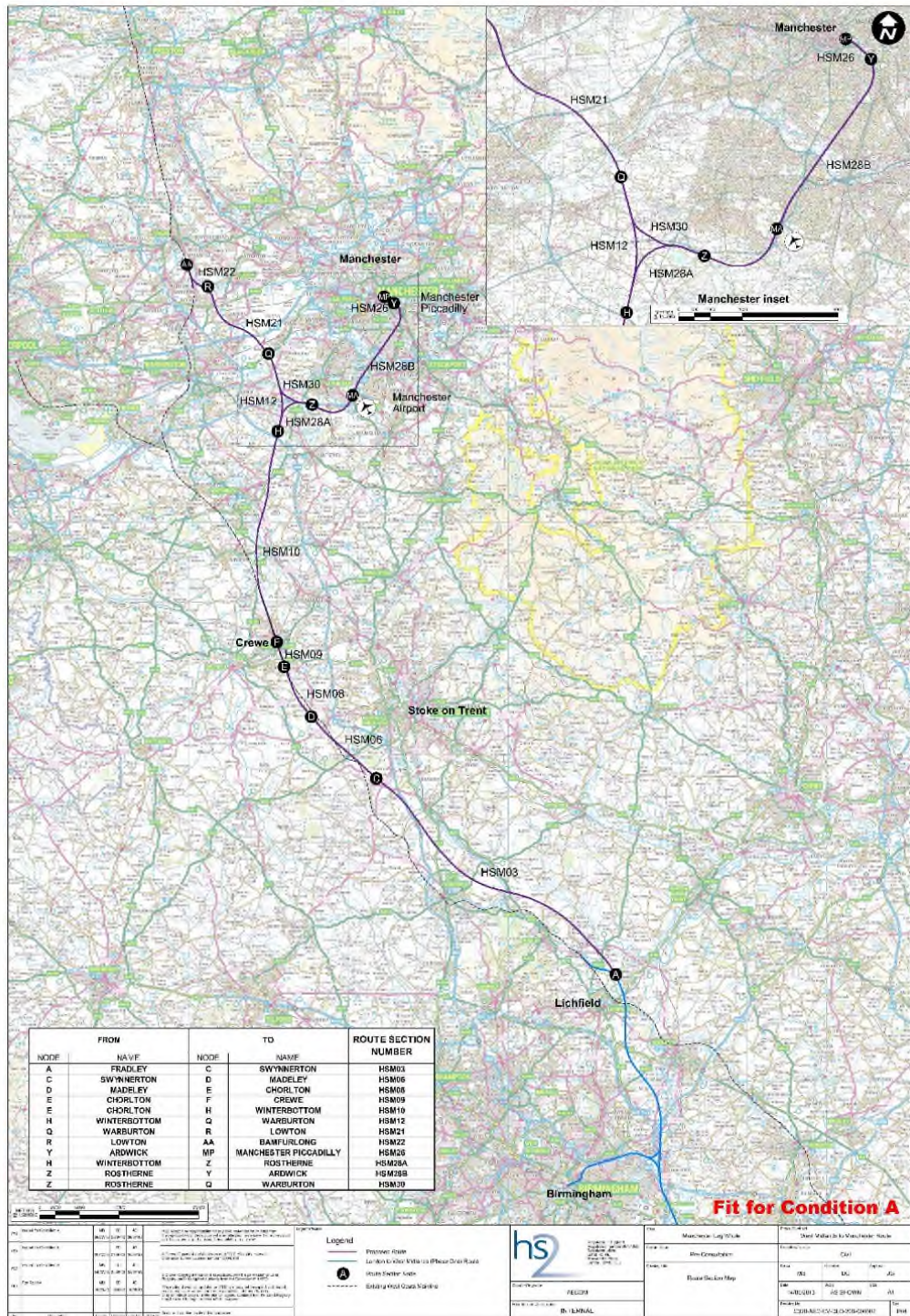


Figure 3 Western Leg of Phase Two as consulted on in 2013

8. Acceleration of Phase 2a

- 8.1. In 2014, Sir David Higgins recommended (in two reports, HS2 Plus and Rebalancing Britain) accelerating delivery of the section of the Phase Two route from the West Midlands to Crewe.

- 8.2. By opening the section of Phase Two to Crewe by 2027 instead of 2033 as originally planned, the benefits of HS2 will be brought to the North sooner.
- 8.3. In the November 2015 Command Paper High Speed Two: East and West, The Next Steps to Crewe and Beyond, the Government, having considered a number of options for accelerating delivery of part of the Phase Two route, announced its intention to bring forward the route to Crewe, and set out the preferred line of route for the Proposed Scheme.
- 8.4. The preferred line of route included amendments made in response to the 2013/2014 consultation, as well as the development of scheme wide design requirements.
- 8.5. The Government considered whether there were alternative sections of Phase Two that could be brought forward to become operational in 2027. Alternative sections studied were:
 - between Sheffield and Leeds;
 - the Western Leg all the way to Manchester; and
 - between Birmingham and the East Midlands.
- 8.6. The following criteria were used to determine which alternative sections of Phase Two could be brought forward:
 - connectivity to Phase One;
 - delivery of clear connectivity and journey time benefits;
 - readiness of the design; and
 - ability to accelerate delivery to complete by 2027.
- 8.7. The Proposed Scheme has a number of advantages over other sections of Phase Two as a standalone Scheme. It connects directly with Phase One allowing high speed trains to run on to Crewe from London on a dedicated high speed network. Additional rolling stock (over that used for Phase One) is not required. It improves journey times between London and the key markets of Manchester and the North West. It also has the potential both to relieve some pressure on bottlenecks of the WCML and to improve reliability and performance. By connecting to the conventional rail network at Crewe, the Proposed Scheme can also benefit from the existing rail connectivity at Crewe. It does not pass through any major urban areas, nor require the delivery of new stations, meaning that it can be developed and built relatively quickly.
- 8.8. The principal reason for not proceeding with the three alternatives was because, unlike the Proposed Scheme, it would not have been possible to construct those alternatives by 2027, failing to bring some of the benefits of Phase Two sooner. The main reasons for not proceeding with the three alternatives are as follows:

- section of Phase Two between Sheffield and Leeds: this section of the route is more complex as it involves the construction of a new station. Given the complexities of this section of route and the ongoing work required, the Government were not confident that this could be delivered to the required standards as quickly as the route between the West Midlands and Crewe (which does not include any new stations);
- the western leg all the way to Manchester and the WCML link at Golborne: the section of route north of Crewe to Manchester is more complex than the section to the south (i.e. the Proposed Scheme). It travels through an area of complex geology; includes new stations and junctions¹⁸; and potentially requires links with Northern Powerhouse Rail. Further work is also required to consider how the scheme can best be integrated with the growth and development plans of Greater Manchester. Therefore, it was decided that these route sections could not be designed and built in time to open by 2027; and
- between Birmingham and the East Midlands: construction of the route between Birmingham and the East Midlands is not as straightforward as the route between West Midlands and Crewe (i.e. the Proposed Scheme). The location and design of the route and a hub station have also been subject to a further work in order to ensure that HS2 delivers the greatest benefits possible to the East Midlands. This included exploring alternative sites for an East Midlands hub station. Although all this work on these alternatives has concluded, options which may have enabled delivery of the route by 2027 could not have been developed in the time available.

9. The Proposed Scheme

- 9.1. Following the decision to accelerate Phase 2a, work has been undertaken to design and assess the Proposed Scheme. The Proposed Scheme, for which powers are now sought in the Bill as deposited in Parliament in July 2017, is described below.
- 9.2. The Proposed Scheme will comprise a high speed railway line from the end of the Phase One route at Fradley, to Crewe. It will run north-east of Stafford and south-west of Stone, passing through a mainly rural area in Staffordshire and Cheshire East, where a number of small settlements are located.
- 9.3. The route of the Proposed Scheme will connect with the Manchester spur that forms part of Phase One at Fradley, to the north-east of Lichfield. It will continue northwards across the River Trent floodplain, over a series of embankments and viaducts, passing south-east of Kings Bromley over Bourne Brook, the A515 Lichfield Road and the A513 Rugeley Road on viaduct. The route will continue

¹⁸ Since consideration of these alternatives, it has now been concluded that new stations and junctions will be required on this section of the Phase Two route.

over the River Trent and will run 500m west of Blithbury through multiple cuttings. It will then pass between the villages of Stockwell Heath and Colton and over Moreton Brook on viaduct.

- 9.4. The route will continue in cutting with a retaining wall past Mayfield Children's Home, which occupies the Grade II listed Moreton House, and will emerge onto embankment. The route will cross the A51 Lichfield Road and will run on viaduct over the existing Macclesfield to Colwich Line, adjacent to the Great Haywood Marina, cross the Trent and Mersey Canal and then cross the River Trent, for a second time. The route will then continue on embankment, crossing Lionlodge Covert, an area of deciduous woodland and designated Local Wildlife Site.
- 9.5. The route will run adjacent to Ingestre Park and through Ingestre Park Golf Club in cutting, with Pasturefields Salt Marsh Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI) approximately 900m to the north of the route of the Proposed Scheme. The route will then run through an area used for car parking and camping in the southern part of the Staffordshire County Showground in cutting, passing under the A518 Weston Road. It will then continue through Hopton passing through a landscaped retaining wall screened by a false cutting¹⁹ and will then continue in cutting. The route will then pass Marston on embankment, and continue past Yarlet in cutting running beneath the A34 Stone Road.
- 9.6. The route will continue on a series of embankments and cuttings, broadly following the M6 and crossing Filly Brook and the Norton Bridge to Stone Railway on viaduct.
- 9.7. The route will then cross Yarnfield Lane, where an infrastructure maintenance facility referred to as the Stone Infrastructure Maintenance Base - Rail (IMB-R) will be located. Railway access tracks to connect the route with the IMB-R will run along the western side of the route, with a connection to the Norton Bridge to Stone Railway. The route will then cross the M6 on viaduct near Stone and Yarnfield.
- 9.8. The route will pass to the north of Swynnerton on an embankment. Continuing north, the route will pass Swynnerton Old Park in cutting, passing under the A519 Newcastle Road. It will continue into the Meece Valley on embankment and then cross Meece Brook on viaduct, before passing through higher ground west of Whitmore.
- 9.9. The route will pass under the A53 Newcastle Road to the south-east of Whitmore Heath, where it will then enter a short section of cut-and-cover tunnel. This will be followed by a twin bore tunnel under the settlement of Whitmore Heath. The route will pass through Whitmore Wood Ancient Woodland in cutting with a retaining wall on the north-east side to reduce the loss of ancient woodland. The route will enter the River Lea valley on an

¹⁹ A means of screening a linear feature (e.g. a railway) by forming embankments on both sides of the feature.

embankment, then cross the WCML, the Stoke to Market Drayton Railway (also known as the Silverdale line of the Stoke to Market Drayton Railway), the River Lea and the Madeley Chord railway on viaduct. The route will then continue on embankment, passing several historical heritage assets, including the Grade II listed Hey House and Old Madeley Manor Scheduled Monument.

- 9.10. The route will continue towards the village of Madeley passing under the A525 Bar Hill Road before entering a twin bore tunnel, at Bar Hill Ancient Woodland. North of Madeley the route will continue in a shallow cutting before crossing the River Lea and associated floodplain and Checkley Brook on a viaduct.
- 9.11. The route will then run on embankment before transitioning into a shallow cutting, passing under Checkley Lane and will then continue northwards crossing over the realigned Den Lane.
- 9.12. The route will then continue in cutting and will pass under the realigned Newcastle Road before terminating in a retained cutting at a headwall²⁰ to the south of Crewe. This will form the boundary between the Proposed Scheme and Phase 2b.

HS2 spurs

- 9.13. As well as the main Phase 2a route, the Proposed Scheme will also include two spurs that will allow trains to transfer between the HS2 main line and the existing WCML northbound towards Crewe (northbound spur) and southbound towards London (southbound spur).
- 9.14. A number of options have previously been considered and consulted upon in 2016 as part of the proposed Phase 2a Design Refinements. The Bill design has been further refined following consideration of the consultation responses.
- 9.15. The spurs will diverge from the HS2 main line on both sides at the point where the HS2 main line passes into the Crewe South cutting, to the north-east of Grange Farm. The southbound spur will initially run along the east side of the HS2 main line and the northbound spur will initially run along the west side.
- 9.16. The northbound spur will then cross over the HS2 main line on viaduct. The two spurs will then converge on the east side of the HS2 main line, 500m north of the Blakenhall viaduct. The spurs will continue together for 3km before connecting into the existing WCML, 200m north of the Newcastle Road overbridge.
- 9.17. To facilitate the connection of the spurs to the WCML, modifications will be required to the existing WCML infrastructure in the South Cheshire area. This will include a new section of the WCML to incorporate the realignment of an existing northbound track along this line and an extension of the existing connection lines to the Basford Hall sidings.

²⁰ A headwall is the wall where the route of the Proposed Scheme terminates.

- 9.18. A number of rail systems modifications will also be required along the WCML and to enable a new island platform at Crewe Station. This will include new track works, realignment of existing tracks, new switches and crossings, the relocation or addition of overhead line equipment, and modifications to signalling, telecommunications, power and other related equipment.

New platform at Crewe station

- 9.19. To accommodate the additional rail services, the existing Cardiff to Manchester Piccadilly services will be diverted via the Manchester Independent Lines tunnel at Crewe. A new island platform will be constructed at Crewe Station to accommodate this service. This will be constructed as part of the Proposed Scheme.

Refinement of the route

- 9.20. This section lists the key changes made to the design of the Proposed Scheme since publication of the working draft EIA report (all dimensions are approximate):
- the infrastructure maintenance depot (IMD) previously proposed at Crewe will now be located near Stone on the site of the construction railhead, in the form of the IMB-R. The maintenance loops proposed at Pipe Ridware are no longer required²¹;
 - the Crewe South portal will be located 340m south of the location previously proposed, and 960m south of the A500 Shavington Bypass which is no longer directly affected;
 - revisions to the lengths and heights of viaducts and embankments on various sections of the route;
 - revisions to the depths of cuttings at various points along the route;
 - introduction of a retaining wall at the southern porous portal of Madeley tunnel and associated modification to Madeley cutting;
 - development of mitigation, including: noise barriers, landscape bunds²², compensatory planting, replacement ponds, and green bridges along the route of the Proposed Scheme;
 - removal of a 1.4km section of the WCML modifications located near Lower Den Farm;
 - introduction of an additional platform (110m in length) at Crewe Station to accommodate rail services;

²¹ For more information, see Information Paper F3: Infrastructure Maintenance and Rail Systems Construction Facilities.

²² A bund is an earthworks structure designed to provide either visual screening or noise attenuation to receptors in close proximity.

- revisions to roads and public rights of way (PRoW) works: including the realignment of some roads and provision of additional overbridges and underbridges;
- revisions to the size and locations of balancing ponds and provision of additional balancing ponds where required;
- a power connection from National Grid Rugeley substation to Newlands Lane auto-transformer feeder station to provide power to the Proposed Scheme (4km in length, with 1.7km underground and 2.3km via overhead line);
- revisions to the location of some tunnel portal buildings; and
- revision to the number and locations of proposed auto-transformer and auto-transformer feeder stations.

9.21. The Proposed Scheme now includes six borrow pits²³, four in the Fradley to Colton community area, one in the Whitmore Heath to Madeley community area and one in the South Cheshire community area, to provide sufficient material of an appropriate quality to construct railway embankments.

10. Interfaces with the Proposed Scheme

Interface with Phase One

- 10.1. The route of the Proposed Scheme will connect to Phase One of HS2 at Fradley. The High Speed Rail (London – West Midlands) Bill 2013 received Royal Assent on 23 February 2017 and initial works have commenced. The significant environmental effects of Phase One of HS2 are reported in the ES deposited with the Phase One Bill and supplementary ES.
- 10.2. As a result of the Proposed Scheme a number of changes to the Phase One design will be required at the interface. Any new or different significant environmental effects arising from these changes are described in the ES for the Proposed Scheme.

Interface with Phase 2b

- 10.3. Development of Phase 2b is continuing and will require a separate hybrid Bill at a later date. The ES for the Proposed Scheme does not include an assessment of potential effects at the interface between the Proposed Scheme and Phase 2b or any cumulative effects that could arise from the construction and operation of both schemes. These will be considered as part of the Phase 2b environmental assessment.

²³ For more information, see Information Paper D12: Borrow Pits

Interface with Crewe Hub

- 10.4. HS2 Ltd continue to work with Network Rail, the DfT, Cheshire East Council (CEC) and other stakeholders in the development of proposals for an enhanced transport hub at Crewe ('Crewe Hub').
- 10.5. For more information, please see Information Paper F1: Crewe.

11. More information

- 11.1. More detail on the Bill and related documents can be found at: www.gov.uk/HS2