



Department  
for Transport

# HS2 Phase 2a

## Strategic Outline Business Case

### Financial Case

**Moving Britain Ahead**

December 20156

The Department for Transport has actively considered the needs of blind and partially sighted people in accessing this document. The text will be made available in full on the Department's website. The text may be freely downloaded and translated by individuals or organisations for conversion into other accessible formats. If you have other needs in this regard please contact the Department.

Department for Transport  
Great Minster House  
33 Horseferry Road  
London SW1P 4DR  
Telephone 0300 330 3000  
General enquiries <https://forms.dft.gov.uk>  
Website [www.gov.uk/dft](http://www.gov.uk/dft)



© Crown copyright 2016

Copyright in the typographical arrangement rests with the Crown.

You may re-use this information (not including logos or third-party material) free of charge in any format or medium, under the terms of the Open Government Licence v3.0. To view this licence visit <http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3> or write to the Information Policy Team, The National Archives, Kew, London TW9 4DU, or e-mail: [psi@nationalarchives.gsi.gov.uk](mailto:psi@nationalarchives.gsi.gov.uk).

Where we have identified any third-party copyright information you will need to obtain permission from the copyright holders concerned.

# Contents

1. Introduction	4
Background	4
Scope	4
2. Costs and Funding	6
Cost Estimate	7
Approach to Contingency and Risk	8
Managing Costs and Risk In Future	9
3. Affordability	11
Summary of Affordability in Development Phase	11
Summary of Affordability in Construction Phase	11
4. Assurance of Costs	13

# 1. Introduction

- 1.1 This document sets out the Financial Case for accelerating delivery of the section of HS2 Phase Two between the West Midlands (at the point at which Phase One joins the West Coast Main Line) and Crewe. This is referred to as Phase 2a.

## Background

- 1.2 Phase 2a is a 37 mile (60 km) stretch of track starting at Fradley at its southern end. The northern end connects with the West Coast Mainline (WCML) south of Crewe to allow HS2 services to join the WCML and serve Crewe.
- 1.3 The Financial Case is one of the five cases making up the Government's Strategic Outline Business Case (SOBC) for Phase 2a. The five cases are:
- Strategic Case
  - Economic Case
  - Financial Case
  - Commercial Case
  - Management Case
- 1.4 The SOBC stage of developing a major project outlines a high level indicative view of what the project is intended to deliver, the benefits of this, and costs in delivering the project. As the project moves through the business case development stage to a final investment decision at the Full Business Case, scope, costs and schedule are refined to give greater confidence in delivery. Therefore, at this stage, the design and train service specification remain indicative but are intended to give Government sufficient confidence in the intentions and outputs of the project to proceed beyond the SOBC.
- 1.5 The strategic objectives and rationale for Phase 2a are set out in the Strategic Case of the SOBC.

## Scope

- 1.6 The Financial Case sets out:
- The expenditure through the Spending Review period i.e. 2016/17 to 2020/21
  - The affordability of investment plans
  - The financial benefits of delivering the route between Fradley and Crewe six years sooner
  - The funding arrangements currently in place for HS2 Limited

- 1.7 Whilst the Strategic Case will set out the policy and strategic context for acceleration to Crewe, the Financial Case addresses long term and in-year affordability. It is therefore concerned with a year-by-year profile of costs for the 2015 Spending Review period, the extent to which there is agreed funding in place to meet those projected costs and the extent to which this is affordable. This contrasts with the Economic Case, which examines the costs and benefits of HS2 in appraisal terms and converts these into net present values (NPVs) for the purposes of producing a benefit-cost ratio (BCR).

## 2. Costs and Funding

- 2.1 In the 2015 Spending Review (SR15), Government restated the long-term funding envelope for the HS2 programme at £55.7bn in 2015 prices. This budget is for delivery of the full HS2 scheme including rolling stock.
- 2.2 The SR15 settlement sets a year by year funding allocation for HS2 as a whole for a period of 5 years (2016/17 to 2020/21). Following the precedent set by Phase One, we will capitalise all expenditure following second reading of the Bill – our prudent assumption is that this will be from April 2018. Table 1 sets out an indicative level of funding for Phase 2a.

Table 1: HS2 SR15 Phase 2a Settlement

£m, nominal	2016/17	2017/18	2018/19	2019/20	2020/21	Total Period
C-DEL <sup>1</sup>	27	29	76	102	172	406
R-DEL <sup>2</sup>	54	42	-	-	-	96.00
T-DEL <sup>3</sup>	81	71	76	102	172	502

- 2.3 As set out above, the SR15 settlement provides an indicative funding allocation for Phase 2a of c. £500m. The indicative Phase 2a allocation over the SR15 period is given in nominal terms (i.e. the allocation assumes forecast inflation for the SR15 settlement period)
- 2.4 The SR15 settlement for Phase 2a includes 40% optimism bias, which has been applied in line with Green Book guidelines. At this stage of the project, there is insufficient maturity in design to develop a Quantified Risk Assessment (QRA) for this phase of the programme. The process for how HS2 has developed this is set out later in this Financial Case.
- 2.5 In order to derive the nominal SR15 funding allocation, an appropriate project specific inflation factor has been applied to the cost estimate. This takes into account inflation indices relevant to the HS2 programme.

<sup>1</sup> Capital Departmental Expenditure Limit

<sup>2</sup> Resource Departmental Expenditure Limit

<sup>3</sup> Total Departmental Expenditure Limit

## Cost Estimate

- 2.6 The cost estimate for Phase 2a is at a higher level of maturity than Phase One was, given an equivalent stage of the business case process. This is because HS2 Limited have been able to take advantage of past experience, and learn lessons from the Phase One process.
- 2.7 HS2 Limited has awarded Professional Services Contracts (PSCs) to provide technical services across a range of disciplines. These technical services will better inform the cost estimates for the next stage of the business case, as well as informing the risks that will assist in developing a QRA to allow contingency to be calculated at various confidence levels.
- 2.8 The Commercial Case provides further information on work which is due to start once the PSCs have been mobilised to better understand the environmental, ground works and system requirements for Phase 2a. Following this process there will be an improved understanding of the risks which in turn will better inform the risk and contingency approach to the route.
- 2.9 Until this work is complete, HS2 will continue to use Optimism Bias to inform the cost estimate in line with HMT and DfT guidance. This approach is consistent with the majority of major projects of this nature where Optimism Bias is applied to counter any optimism that may have materialised within the initial cost estimates for the programme.
- 2.10 As the Phase 2a design matures and the scheme moves through the business case process, HS2 Limited expects to be in a position to complete QRA to inform further estimates. This will allow HS2 Limited to develop more detailed assessments of contingency requirements that correlate to those currently stipulated for Phase One of the programme.
- 2.11 In the 2013 Spending Review (SR13), it was envisaged that Phase Two would be delivered through a single hybrid Bill. We are now planning to have one Bill for Phase 2a, and a second for the remaining scope of Phase Two. Acceleration of the Phase 2a route results in some additional costs due to the need to develop an additional Bill and manage it through Parliament. HS2 Limited's latest cost estimate therefore includes an additional £50m to run this process, thus delivering this element of the programme sooner.
- 2.12 The Phase One train service specification assumes that of the three services per hour each way between London and Manchester, two are routed via Crewe (but do not stop) and so in Phase 2a use the extended high speed line. One is routed via Stoke (again without stopping) and does not therefore utilise the faster journey speeds on offer with the extended high speed line in Phase 2a.
- 2.13 Our analysis demonstrates that if all three HS2 services from Manchester were routed via Crewe then this would lead to an extra £148 million of benefits and £114 million of revenue gain. When the third service is re-routed via Crewe there is an increased chance of possible congestion on the line between Crewe and Manchester, and more detailed work is required to fully understand the impacts. On a conservative basis, we have therefore assumed in our latest cost estimate an additional infrastructure cost of £200 million (£147m, Net Present Value) to facilitate this routing.
- 2.14 The Economic Case considers the cost and benefits of accelerating the Phase 2a route between West Midlands and Crewe sooner than originally intended. The

analysis shows that any increase in costs are offset by the benefits gained as a result of accelerating this route.

- 2.15 Since SR13, HS2 Limited has undertaken further design work to reflect the view of the Phase Two consultation responses. The responses received gave rise to a number of suggested refinements to the route which the Secretary of State has agreed and are detailed in the Phase 2a command paper. These refinements also included recommended design changes in light of the improved design work on Phase One.
- 2.16 We expect to capitalise the cost for the accelerating the route to Crewe based on a prudent assumption of the expected second reading of the Bill. This does not impact the cost estimate, but affects the balance of capital and resource funding needed to develop and deliver the route.

## Approach to Contingency and Risk

- 2.17 At this stage of the project, 40% Optimism Bias (OB) has been applied to Phase 2a which HS2 Limited has derived using the guidance set out in HM Treasury's Green Book (Appraisal and Evaluation in Central Government (Treasury Guidance 2011)), and the 'Supplementary Green Book Guidance'.
- 2.18 The approach that HS2 has taken to develop the OB levels currently employed is set out in the following steps:
- Application of the guidance across all assets on route sections, elements and assets contained within the Phase 2a cost estimate, based on a blended proportion of the OB. This will apply the Upper Bound OB percentages to the Phase 2a Capital Estimate treating as a Benchmark all Civil Elements as Standard & non-Standard Civils and Building Elements as Standard / non-Standard Buildings.
  - Refine the generic application of the guidance by looking at the Phase 2a estimate on an asset by asset basis to determine a reflective assessment of which 'Project Type' is appropriate for each asset based on known Phase Two specific complexities.
  - This approach will enable a 'pin pointed' application of Optimism Bias where those assets with the greatest level of complexity in their design or site conditions, have a higher provision for Optimism Bias applied, while at the same time not over inflating the budget for those assets with greater budget certainty (as is the case when applying a generic Optimism Bias percentage). This process therefore assesses the impact of Project Specific 'Project Type' assessment whilst still applying the Upper Bound Optimism Bias percentages from the Supplementary Green Book Guidance.
- 2.19 Following this process, a number of mitigations have been identified and this allows for a reduction in the OB developed.
- 2.20 A number of wider risks to the current cost estimates remain. For instance, any scope changes made during the passage of the hybrid Bill could add cost and therefore reduce the amount of contingency available. A Cost and Risk Group, comprising officials from DfT, HMT, HS2 Limited and Infrastructure UK (IUK) has been established and will continue to work together to ensure that any additional cost pressures brought about by scope changes are minimised.



2.21 In developing the cost estimate for the accelerated route, a number of key assumptions and exclusions have been made.

- Key Exclusions:
  - a. Crewe Hub station – A new Hub station at Crewe is not part of the existing budget envelope for Phase Two. While further work, including on costs and funding, must be completed before decisions can be taken on whether to proceed, the Government supports the vision for a Crewe Hub. The Government intends to make further announcements on the scheme in 2016, and any proposal to take any Crewe Hub scheme forward will be subject to public consultation. Such a proposal will need to be affordable, offer value for money, and bring benefits to Crewe and the entire region including Cheshire, Warrington, Stoke-on-Trent and Staffordshire.
  - b. Costs for wider connectivity (however some capacity improvements for the classic network are provided for to facilitate integration between classic rail services, and HS2);
- Key Assumptions:
  - a. Provision is made for additional infrastructure costs of £200 million (£147m, Net Present Value) to facilitate the routing of three services per hour from London to Manchester via Crewe, should we decide to run that service specification
  - b. During construction, the works will not disrupt the business of any railway companies to the extent that compensation would require to be paid, other than through or to Network Rail under traditional industry access mechanisms. The only physical interface with the existing rail network will be a single new junction south of Crewe.

2.22 The key funding assumption remains that HS2 will be publicly funded. However, we will continue to investigate private financing and third party funding in order to reduce the costs to the taxpayer. As we develop the Business Case for Phase 2a further, we will also continue to explore opportunities to reduce costs and to capture any upside risks which may drive improvements in the affordability and value for money of Phase 2a and the HS2 programme overall. The Cost & Risk Group provides the Programme Board with assurance on whole life affordability of the HS2 Programme including cost, risks and opportunities. More information on programme governance can be found in the Phase 2a Management Case.

## Managing Costs and Risk In Future

2.23 DfT and HS2 Limited both intend to deliver the most cost effective design for the railway and ensure that the best value is achieved within the agreed funding envelope of £55.7bn (2015 prices)

2.24 HS2 Limited has identified a number of initiatives within the cost estimate, and the likelihood of their success of achieving possible savings. These include areas of value engineering, implementing the efficiency challenge programme and initiatives which will be developed in light of international best practice.

2.25 These arrangements form part of a wider oversight regime for delivering HS2 and managing costs. This includes:

- The Development Agreement, which sets out the shared values and objectives of the organisations, the scope of the project, governance arrangements, cost control procedures and respective roles and responsibilities;
- A dedicated High Speed Rail Programme Board which has representation from HMT and IUK which oversees the overall HS2 programme and reports progress to DfT's Board and to Ministers;
- Management reporting and controls to enable DfT as sponsor to have visibility of programme costs and exposure against risk limits, and agreed trigger points where intervention or escalation is needed. HS2 Limited is currently seeking ISO 9001 certification, which if successful, will demonstrate that the company has a capable and continually improving management information system;
- Cross departmental oversight between DfT, HMT and IUK on the progress of the project against the cost programme and levels of risk exposure through a remitted Cost and Risk Group; and
- The establishment of an Efficiency Challenge Programme to actively monitor and progress identified initiatives to reduce the delivery cost of the programme through efficient ways of working.

## 3. Affordability

- 3.1 This section of the Financial Case looks at the long-term affordability of the proposed route. In the 2015 Spending Review (SR15), Government restated the long-term funding envelope for the HS2 programme at £55.7bn in 2015 prices. The SR15 envelope includes funding for Phase 2a and contingency. The economic case for Phase 2a considers additional sensitivities including higher levels of contingency for the scheme.
- 3.2 Whilst the total envelope for the project has been established at £55.7bn, at this stage of development it would be inappropriate to allocate a fixed budget for Phase 2a. However, for appraisal purposes, we have used a cost estimate of £3.72bn (in 2015 prices) for Phase 2a. This is reflected in the economic case.
- 3.3 HMT has been closely involved in the development of the overall HS2 project. Treasury officials sit on the High Speed Rail Programme and Investment Board and the Cost and Risk Group. HMT Ministers' agreement is also required at key decision points such as the route consultation and the deposit of the hybrid Bill.
- 3.4 The case for HS2 has been calculated on the basis of the project being fully publicly funded and therefore the Financial Case works on this fundamental assumption. However, DfT continues to explore the scope to draw in third party funding to lessen the exposure of the tax payer, and also continues to consider the potential for private financing to play a role in helping reduce the up-front costs falling on the tax payer.

### Summary of Affordability in Development Phase

- 3.5 As set out previously, accelerating the route to Crewe requires an additional hybrid Bill: funding to cover this has formed a central part of our SR15 Resource DEL<sup>4</sup> settlement. The cost of developing a hybrid Bill for the remaining elements of Phase Two (i.e. completion of the route north of Crewe to Manchester, and the eastern leg of Birmingham to Leeds) will form an integral part of the funding allocated at SR15.
- 3.6 Preparation of an additional hybrid bill for the route to Crewe requires additional resource, and a transition plan is currently being developed within HS2 Limited which will set out the likely resource requirements to deposit the bill before the end of July 2017.

### Summary of Affordability in Construction Phase

- 3.7 HS2 can be considered affordable providing the overall costs of the programme do not increase above the funding envelope established at SR15 and providing future Spending Reviews allocate sufficient funding as the programme progresses.

---

<sup>4</sup> Departmental Expenditure Limit

- 3.8 There are, however, risks to note. The costs relate to the current scheme scope and do not include wider risks such as the risk of additional scope being added during the bill phases, additional costs associated with over-site development or connectivity around stations, or of delays to the hybrid Bill timetable. Some of these potential costs are within the Department's control and some could also have potential benefits which as a result offset additional costs incurred. Where additional scope is added to the programme, the Department would look to secure further funding to secure benefits that arise.
- 3.9 Although capital budgets have been provided up to 2020/21, HS2 is likely to require significant capital from 2021 to 2025 to reflect the parallel construction of Phase One, Phase 2a and the remaining scope of Phase Two, as well as the procurement of rolling stock. Having established a funding envelope of £55.7bn (2015 prices) for HS2, DfT and HMT Ministers will still need to make decisions regarding investment priorities during this time.
- 3.10 Previous experience of major projects suggests that there can be significant changes to the profile of expenditure, even whilst remaining within the total overall budget. This can be due to a number of factors, for example, the need to bring forward work to exploit supply chain capacity or deferring work due to adverse weather.
- 3.11 Through the acceleration of the works for Phase 2a, there are potential benefits from delivering this 6 years earlier than planned. By constructing early we can help smooth the profile of spend, and from a cost perspective, costs incurred sooner will be subject to less inflation. This can help manage spending of the public purse, and also benefit the economy by spreading the investment made in HS2 over an extended period.
- 3.12 There are also potential benefits to be had in securing better value from the market by procuring services by phases. The Commercial Case details the approach to procurement, but through accelerating Phase 2a delivery, we believe that we will be able to secure better value for money by staging the procurements for the various activities and integrating them with Phase One.

## 4. Assurance of Costs

- 4.1 The Department commissioned HS2 Limited in December 2014 to develop a cost estimate for the HS2 programme with the assumption that delivery of one section of HS2 Phase Two between the West Midlands (at the point at which Phase One joins the West Coast Main Line) and Crewe would be accelerated.
- 4.2 As part of this commission, the Department requested that this cost estimate be appropriately assured to guarantee that the cost estimates had a level of rigour attached, appropriate to the level of design. This was seen as an essential part of ensuring that the investment decision for Phase 2a had appropriate scrutiny for suitability and accuracy.
- 4.3 In developing the cost estimate, the Phase Two team within HS2 Limited developed the cost estimate (1st Line of Defence), providing review and challenge within the team, and subsequently seeking 2nd Line of Defence assurance through the central cost management team. This team is a dedicated resource within HS2 Limited, which owns HS2 Limited's cost estimation approach, methodology and systems, and which provides assurance to HS2 Limited by providing scrutiny over the cost estimates themselves and the way they have been developed.
- 4.4 The 3rd Line of Defence was provided by the Department's independent project representative (P-REP), which undertook a further review and provided views on issues and concerns regarding the cost estimate.