National Audit Office

Report
by the Comptroller
and Auditor General

Department for Transport and HS2 Ltd

Progress with preparations for High Speed 2

HC 235 SESSION 2016-17 28 JUNE 2016

Our vision is to help the nation spend wisely.

Our public audit perspective helps Parliament hold government to account and improve public services.

The National Audit Office scrutinises public spending for Parliament and is independent of government. The Comptroller and Auditor General (C&AG), Sir Amyas Morse KCB, is an Officer of the House of Commons and leads the NAO, which employs some 810 people. The C&AG certifies the accounts of all government departments and many other public sector bodies. He has statutory authority to examine and report to Parliament on whether departments and the bodies they fund have used their resources efficiently, effectively, and with economy. Our studies evaluate the value for money of public spending, nationally and locally. Our recommendations and reports on good practice help government improve public services, and our work led to audited savings of £1.15 billion in 2014.

National Audit Office

Department for Transport and HS2 Ltd

Progress with preparations for High Speed 2

Report by the Comptroller and Auditor General

Ordered by the House of Commons
to be printed on 27 June 2016

This report has been prepared under Section 6 of the National Audit Act 1983 for presentation to the House of Commons in accordance with Section 9 of the Act

Sir Amyas Morse KCB
Comptroller and Auditor General
National Audit Office

24 June 2016

HC 235 | £10.00

This report examines whether the Department for Transport is managing the High Speed 2 programme effectively.

11132 06/16 NAO

Contents

Key facts 4

Summary 5

Part One
Background to the
High Speed 2 programme 10

Part Two
The costs of High Speed 2 19

Part Three
The programme schedule
and delivery readiness 27

Part Four
Preparations for delivering benefits 34

Appendix One
Our audit approach 43

Appendix Two
Our evidence base 45

The National Audit Office study team consisted of:
Hedley Ayres, Jola Groves, Oscar Ramos and William Rollo, under the direction of Rebecca Sheeran.

This report can be found on the National Audit Office website at www.nao.org.uk

For further information about the National Audit Office please contact:

National Audit Office
Press Office
157–197 Buckingham Palace Road
Victoria
London
SW1W 9SP

Tel: 020 7798 7400

Enquiries: www.nao.org.uk/contact-us

Website: www.nao.org.uk

Twitter: @NAOorguk

Key facts

2026
target opening date for phase 1

60%
the Department and HS2 Ltd's level of confidence that phase 1 of the programme will be delivered by 2026. HS2 Ltd are reviewing the schedule with the aim of increasing this to 80%

£55.7bn
agreed funding for the High Speed 2 programme (including infrastructure and rolling stock) in 2015 prices

£417 million	estimated additional funding requirement, including contingency, for work to enable over-site development at Euston station
2033	target opening date for the full railway
2,600	petitions processed during the passage of the hybrid bill for phase 1
£7 billion	savings required to bring the costs of phase 2 within the agreed funding at the time of the 2015 spending review
£9 billion	potential phase 2 savings identified by the Department, HS2 Ltd and a Cabinet Office led review since the 2015 spending review. The Department has asked HS2 Ltd to incorporate the efficiencies and cost savings in its next cost estimate
32%	of planning and development milestones delivered late on the programme so far
1.8:1	current benefit–cost ratio for the full programme excluding wider economic impacts
2.2:1	current benefit–cost ratio for the full programme including wider economic impacts

Summary

1 High Speed 2 is a highly ambitious programme to create a new high speed rail service between London to Manchester and Leeds, via Birmingham. The Department for Transport (the Department) is the sponsor of the £55.7 billion programme (2015 prices) and HS2 Ltd, a company wholly owned by the Department, is responsible for developing, building and maintaining the railway.

2 The programme is split into three phases. Phase 1 between London Euston and the West Midlands is due to begin construction in 2017 and open in 2026. Phase 2a, between the West Midlands and Crewe is expected to open in 2027, with phase 2b, completing the full network to Manchester and Leeds, due to open in 2033.

3 The Department's objectives for High Speed 2 are to enable economic growth by increasing capacity to meet existing and future rail passenger demand, and to improve connectivity between UK towns and cities. The Department also aims to encourage additional investment to drive regeneration, particularly in areas around stations.

4 We reported on early preparations for High Speed 2 in 2013, focusing on the business case, programme management and the estimated costs of the programme. Since then, the Department and HS2 Ltd have made significant progress. They have issued tender documents for major civil engineering contracts on phase 1, and plan to announce the preferred route for phase 2b later in 2016.

Scope of the report

5 This report looks at the key risks to be managed to protect value for money, and provides an update on the forecast costs and progress against the programme schedule. The report also looks at progress with preparations for delivering the benefits of the programme. We expect to return to look at the programme as it develops.

Key findings

6 **The Department and HS2 Ltd have taken steps to address weaknesses in the business case identified in our 2013 report**. The strategic context and the objectives of High Speed 2 are clearer than when we last reported and the business case includes more detail about the scale of potential future capacity shortages – particularly on the west coast main line (paragraphs 1.3 and 4.3).

7 **The Department and HS2 Ltd are on course to gain the legislative powers to start building phase 1 of the railway by December 2016 which represents a significant achievement**. The Department and HS2 Ltd have had to process some 2,600 petitions. To achieve this the Department extended the original timetable for gaining Royal Assent for phase 1 by 21 months. It is sensible that the proposed legislative timetables for phases 2a and 2b are similar in length to the more realistic revised timetable for phase 1. However, the longer legislative timetable has put greater pressure on the opening of phase 1 by 2026 (paragraphs 3.3 to 3.5 and 3.13).

8 **The 2026 target opening date for phase 1 is at risk**. HS2 Ltd have made good progress with some major procurements for phase 1. However, a range of indicators suggest that the schedule is under pressure. For example, HS2 Ltd is only 60% confident that it will complete phase 1 by December 2026. The Department's view is that this is too low, and it has asked HS2 Ltd to revisit the programme schedule in order to increase confidence in delivery to 80%, without increasing costs. It has asked HS2 Ltd to assess the impact of extending the timetable for opening phase 1 by up to 12 months (paragraphs 3.13 to 3.16).

9 **The Department set HS2 Ltd a schedule for achieving delivery readiness that was too ambitious**. In 2013, the Committee of Public Accounts raised concerns about the ambitious timetable for High Speed 2. HS2 Ltd is building its capability at the same time as starting to deliver the programme. There are a large number of major decisions which need to be made over the next few years, including a decision on the route for phase 2b. It is important that HS2 Ltd builds and embeds the organisational capability, and produces fully assured plans to enable it to complete work on schedule, and to gain the delegated authority to deliver the programme efficiently. The Department and HS2 Ltd delayed the first of three formal review points – which tested HS2 Ltd's readiness to deliver – by ten months. By May 2016, HS2 Ltd had the capability it had originally planned to reach by July 2015, but did not pass the first review point due to concerns about cost and schedule (paragraphs 3.6 to 3.10 and Box 3).

10 **A shift from public funding to private finance for trains and depots would increase the risk to opening phase 1 in 2026**. The Department will need to agree its overall strategy for trains and depots, which is expected in autumn 2016, before approving a decision on financing. The Department and HS2 Ltd have commissioned three studies since 2012 to test the value for money of different financing options. All have concluded that public funding provides best value for money and the lowest risk to the programme schedule. The privately financed Intercity Express and Thameslink train procurements took four to five years to negotiate. The target date for awarding a contract for High Speed 2 trains is late 2019, around 3 and a half years away, so any decision to move to private financing now would risk delaying the opening of phase 1. The Department currently plans to publicly fund the trains and depots with the option to seek a private buyer once the procurement is complete (paragraphs 3.11 to 3.12 and Figure 9).

11 **The programme faces cost pressures**. For phase 1 of the programme the current forecast cost slightly exceeds available funding by £204 million, and there is less contingency to deliver phase 1 than the Department and HS2 Ltd were aiming for at this stage. At the 2015 spending review, the estimated cost of phase 2 exceeded available funding by £7 billion. Work by the Department, HS2 Ltd, and a review commissioned by the Cabinet Office has identified potential to save around £9 billion on phase 2. £2 billion of these savings have been agreed, and the Department has asked HS2 Ltd to look at incorporating the remaining potential savings into its next cost estimate. Cost estimates for phase 2 are at a much earlier stage of development than phase 1 and some elements are currently unfunded. The cost estimates for phase 2 may move up or down as a detailed baseline cost, similar to that in place for phase 1, is developed (paragraphs 2.3 and 2.8 to 2.12).

12 **There is a risk that the combined impact of cost and schedule pressures result in reduced programme scope, and lower the benefit–cost ratio**. The benefit–cost ratio for phase 1 assumes that the programme is delivered well within its available funding. The 2013 economic case suggests that if costs are closer to, or exceed, available funding, which, given cost and schedule pressures, is a possibility, then the benefit–cost ratio, including wider economic impacts, would fall from 1.7 to around 1.5. If the programme is delayed, then benefits would be deferred. To help manage costs, the Department has asked HS2 Ltd to explore options for reducing the programme scope in ways that do not have a significant impact on programme benefits (paragraph 2.16).

13 **The £55.7 billion funding package does not cover funding for all the activity needed to deliver the promised growth and regeneration benefits.** The funding covers the cost of building the railway and buying new trains and maintenance depots in order to deliver the capacity and connectivity benefits assessed in the economic case for High Speed 2. Local authorities, in partnership with others such as Local Enterprise Partnerships, are responsible for driving regeneration and local growth benefits, and there is a risk that these wider benefits will not materialise if funding cannot be secured. The main exception is Euston where the Department plans to carry out works to enable further development above the High Speed 2 station at Euston, with an estimated funding requirement of £417 million, including contingency (paragraphs 4.7 to 4.8).

14 **The Department and HS2 Ltd have developed a structured plan for delivering regeneration benefits at an early stage**. Plans are more advanced than they were on, for example, High Speed 1, where benefits have not materialised as expected. The Departments for Communities and Local Government and Business, Innovation & Skills, and local authorities are working well together, given the early stage of the programme (paragraphs 4.11 and 4.12).

15 Effective integration of High Speed 2 with the wider UK rail system is challenging and poses risks to value for money. In the coming years the Department will need to address a number of issues including how High Speed 2 services will complement or compete with other rail services, and how High Speed 2 will interact with proposed improvements in the north. Failure to fully understand these interactions and make decisions in the right sequence will make delivering the programme more challenging. It could also mean decisions are made now which reduce benefits or increase costs across the network in future. The Department is now developing a long-term vision for the whole rail system (paragraphs 4.9 to 4.11).

Conclusion on value for money

16 Since we reported in 2013 the Department and HS2 Ltd have made significant progress in preparing to deliver the programme. However, HS2 Ltd has struggled to meet the overly ambitious timetable set for it by the Department for buidling delivery readiness, while also developing the programme. This will add to the challenge of delivering an already ambitious programme over the next few years. The programme is now facing cost and schedule pressures and, in response, the Department and HS2 Ltd are considering the impact of extending the phase 1 schedule by up to twelve months. Unless the Department and HS2 Ltd make forthcoming decisions promptly, with greater realism about timetables and full understanding of the trade-offs between costs, schedule and benefits, including the impact on the wider network, value for money will be at risk.

Recommendations

a **The Department's accounting Officer should continue to periodically assure himself of the deliverability of the programme schedule as the programme progresses. In the near term the Department and HS2 Ltd should ensure that the programme schedule for phases 2a and 2b is based on lessons learned from the challenge of balancing cost and schedule in the detailed design of the phase 1 schedule.**

b **The Department should assess whether the pace at which the programme is planned to move over the next few years allows key recommendations and decisions to be supported by full assurance, and to allow governance bodies sufficient time to consider fully the implications of their decisions.**

c **The Department should establish a clear, thorough and realistic process by which HS2 Ltd will gain the delegated authority it needs to deliver the programme efficiently, and for the Department to be able to focus on sponsoring and overseeing phase 1.**

d **The Department and HS2 Ltd should quantify the impact that proposed and future changes to the existing plans for phase 2 will have on core benefits, and the wider strategic aims of the programme, and communicate the expected impacts clearly and promptly to all affected stakeholders.**

e **HS2 Ltd and the Department should ensure that the rationale behind its key future decisions about High Speed 2, including the implications for the wider network, are clearly communicated to all stakeholders in order to allow the rail industry as a whole to prepare for the future.**

Part One

Background to the High Speed 2 programme

1.1 This part of the report sets out the key features of the High Speed 2 programme (the programme), including:

- the planned route;
- the programme objectives;
- funding and high-level programme schedule; and
- the delivery and governance structure

The route

1.2 High Speed 2 is a programme to construct a new high speed railway between London Euston, and Leeds and Manchester, splitting to form a Y-shape in the midlands. Current plans are for trains to call at 10 new high speed rail stations (see **Figure 1**):

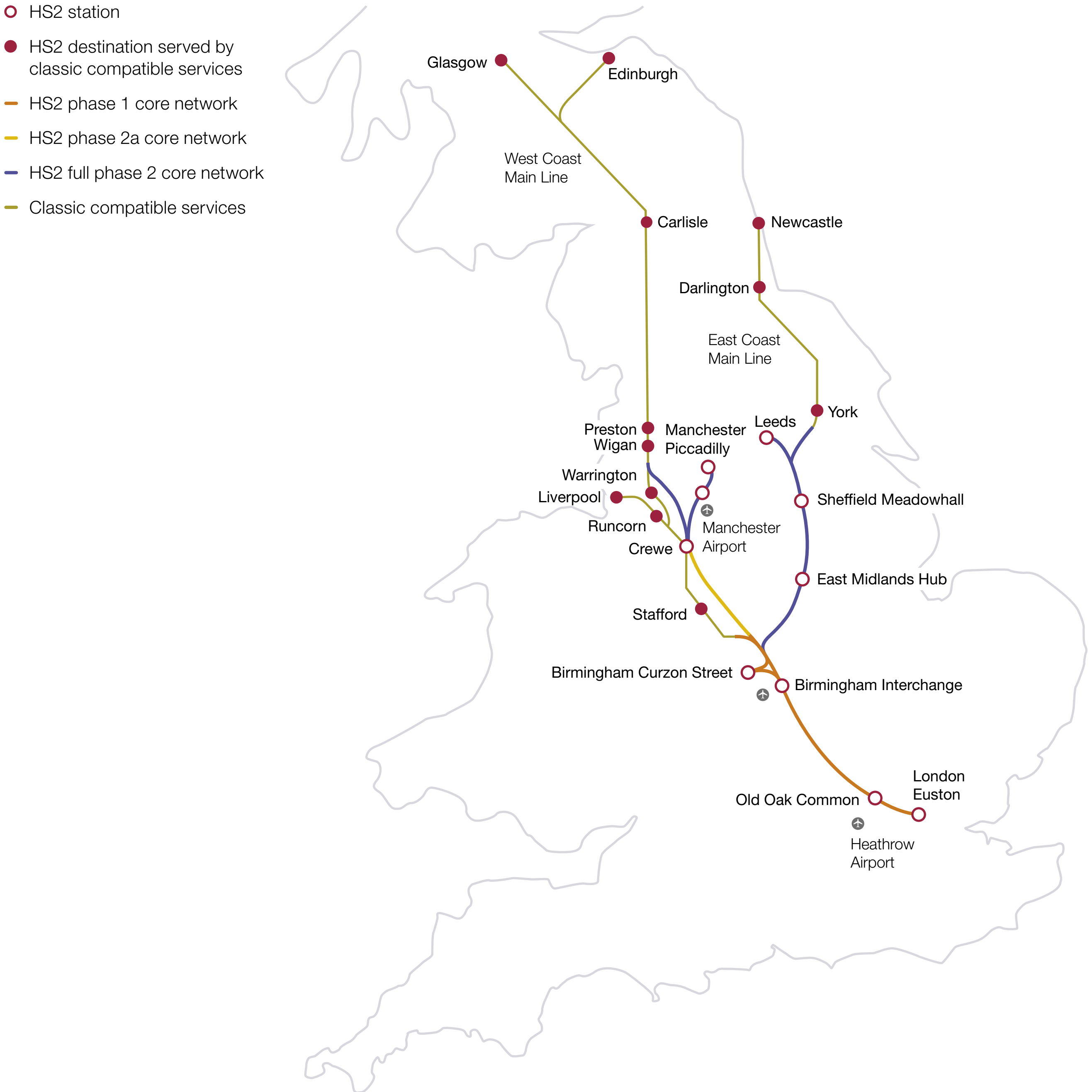
Programme objectives

1.3 The strategic context and the objectives of High Speed 2 are clearer than when we last reported, following the update of the business case for High Speed 2 in 2013 and the further supplement to the October 2013 Strategic Case published in November 2015. The Department and HS2 Ltd have presented a more convincing case about the scale of potential future capacity shortages – particularly on the west coast main line, including appraising alternative options for increasing capacity to meet projected demand. The revised 2013 business case places High Speed 2 in the policy context of the government's investment in infrastructure to promote and sustain economic growth. The Department and HS2 Ltd have set out two main objectives for the programme:

- provide sufficient capacity to meet long-term demand, and to improve resilience and reliability across the network; and
- improve connectivity by delivering better journey times and making travel easier.

Figure 1

High Speed 2 route



Source: Department for Transport

1.4 High Speed 2 is intended to release capacity for new commuter services and freight trains on the West Coast Mainline. Increased capacity should also be enabled by running up to 18 High Speed 2 services an hour out of Euston to run trains at up to 330 kilometres per hour, reducing journey times between major cities. **Figure 2** sets out the proposed journey time reductions between London and other UK cities.

1.5 The Department also has broader ambitions for the programme. Local growth and regeneration remains a key objective. The 2014 report *Rebalancing Britain: From HS2 towards a national transport strategy*, describes High Speed 2 as a catalyst for a fundamental rebalancing of the national economy through:

- integration of the high speed line with other transport systems; and
- closer integration with Network Rail, the Highways Agency and local authorities.

The programme schedule

1.6 The route is planned to open in three phases: phase 1 (2026), from London to the West Midlands, phase 2a (2027), a short extension from the West Midlands to Crewe, and phase 2b (2033), two lines from Crewe on to Manchester and Birmingham to Leeds. Each of the phases requires primary legislation in the form of a Hybrid Bill to be passed before authority is granted to construct that section of the railway (see **Figure 3** on page 14).

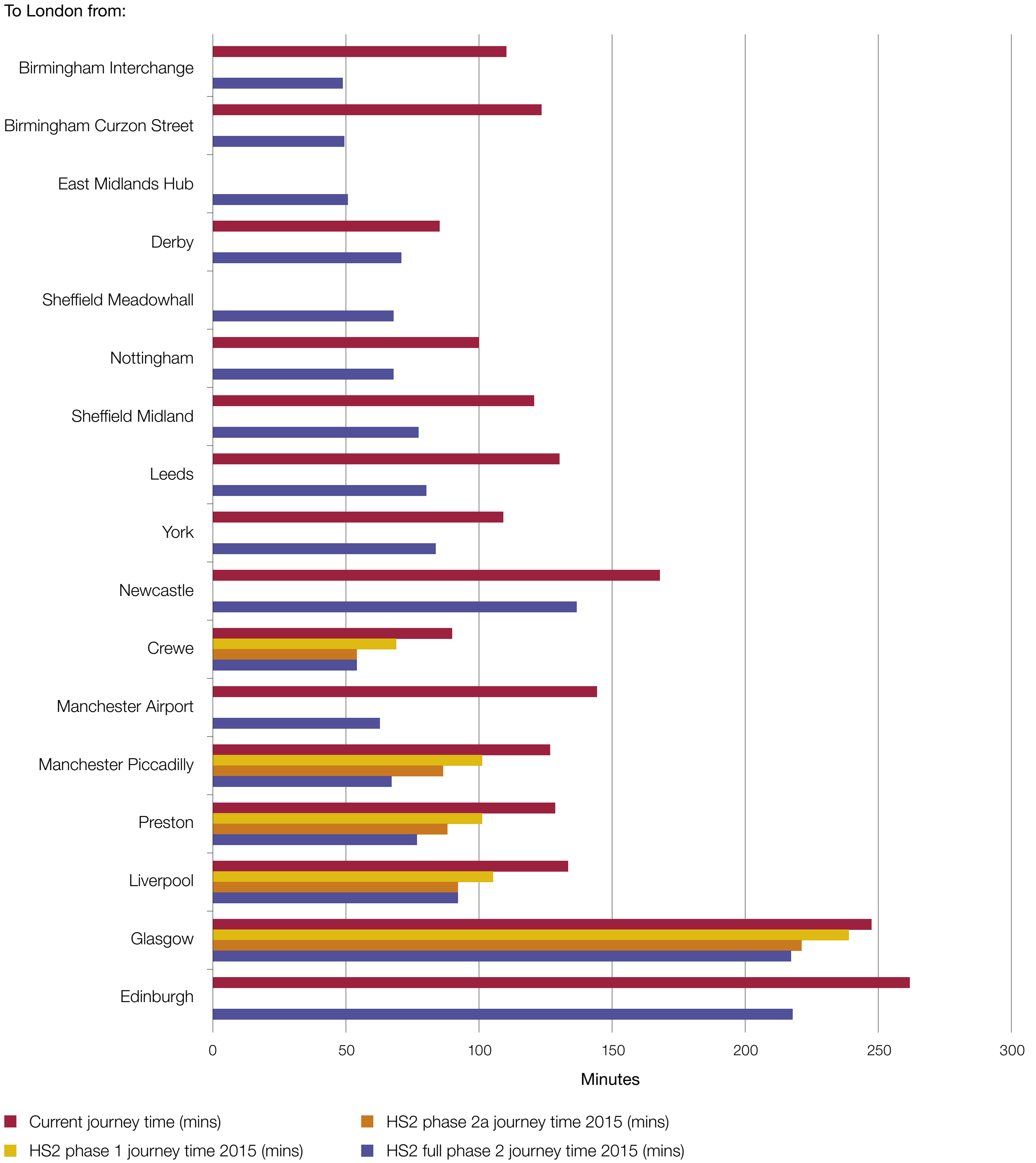
Programme funding

1.7 In the 2015 Spending Review the Department secured long term funding from HM Treasury of £55.7 billion, including £7.1 billion for rolling stock. The funding package was £50.1 billion at the time of the 2013 Spending Review. The increase since then is entirely due to the change in the price basis from 2011 to 2015 prices, using a specific inflation index designed for the programme. The Department for Transport also plans to carry out work to enable development above the site of the High Speed 2 station at Euston. HM Treasury has made a long term funding commitment to this development on the understanding that revenue from the development returns to the exchequer, and has agreed £52 million of funding covering the period 2018-19 to 2020-21. The Department estimates the funding requirement to be £417 million, including contingency (2015 prices).[1] The Department will need to bid for the remaining funding as part of future spending reviews. At the end of 2015-16, HS2 Ltd had spent around £1.3 billion of this funding package; £927 million on development and management of the programme and £417 million on acquisition of land and property.[2]

1 Contingency requirement calculated at a level of 95% certainty.
2 This figure covers expenditure by HS2 Ltd since 2012, and excludes the cost to the Department of sponsoring the programme.

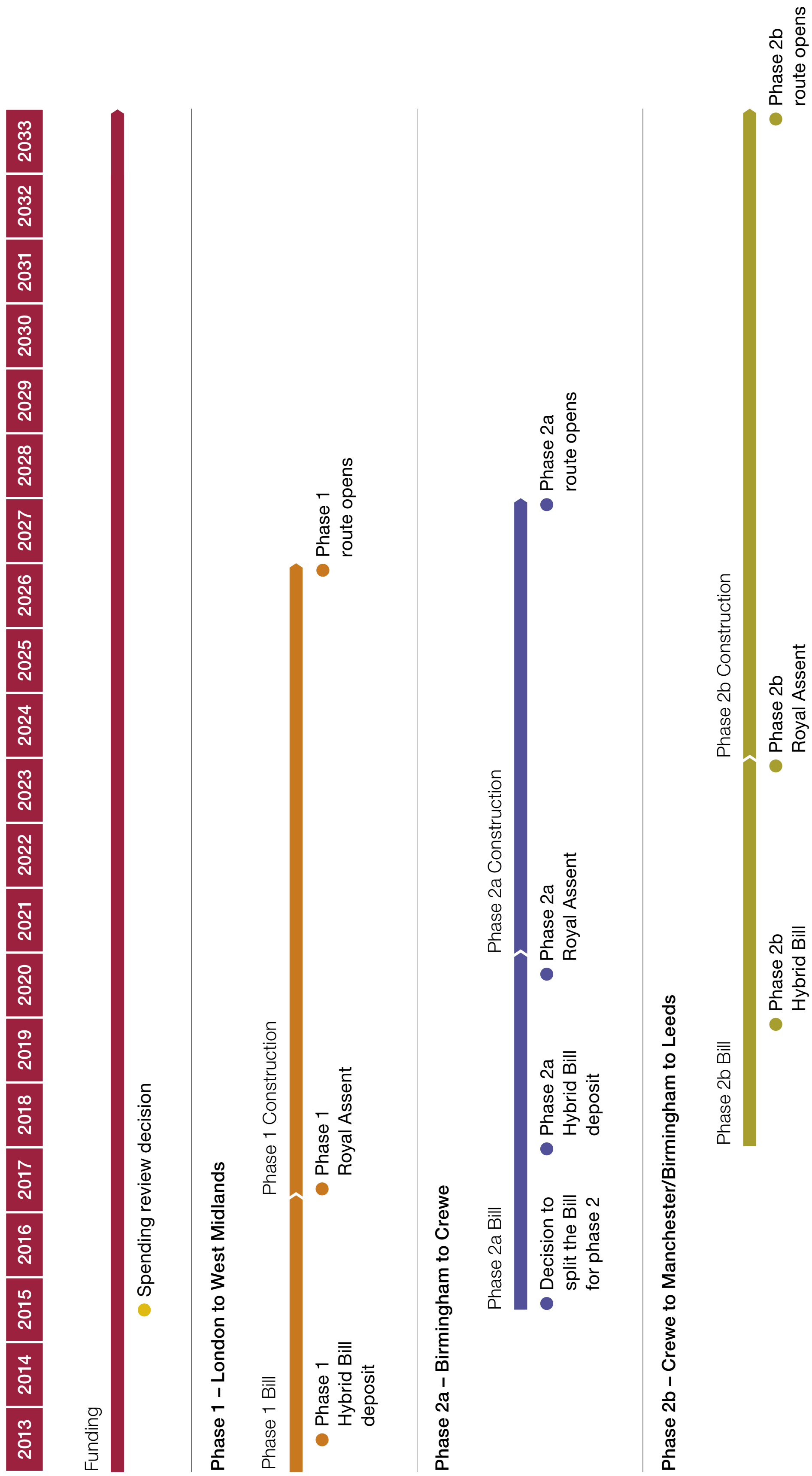
Figure 2

High Speed 2: Journey time savings to London



Source: Department for Transport

Figure 3
High Speed 2 timetable



Source: Department for Transport

1.8 It is encouraging that HM Treasury has granted the Department flexibilities to transfer funding from one year to the next. This should help the Department and HS2 Ltd to manage the programme effectively over the long term:

- From 2016-17, the Department will be able to move up to 10% of the programme's annual phase 1 budget between years.
- Unspent funding at the end of a financial year will remain in the funding envelope (excluding funding for over-site development enabling works at Euston) and can be reallocated to the project at a later date.

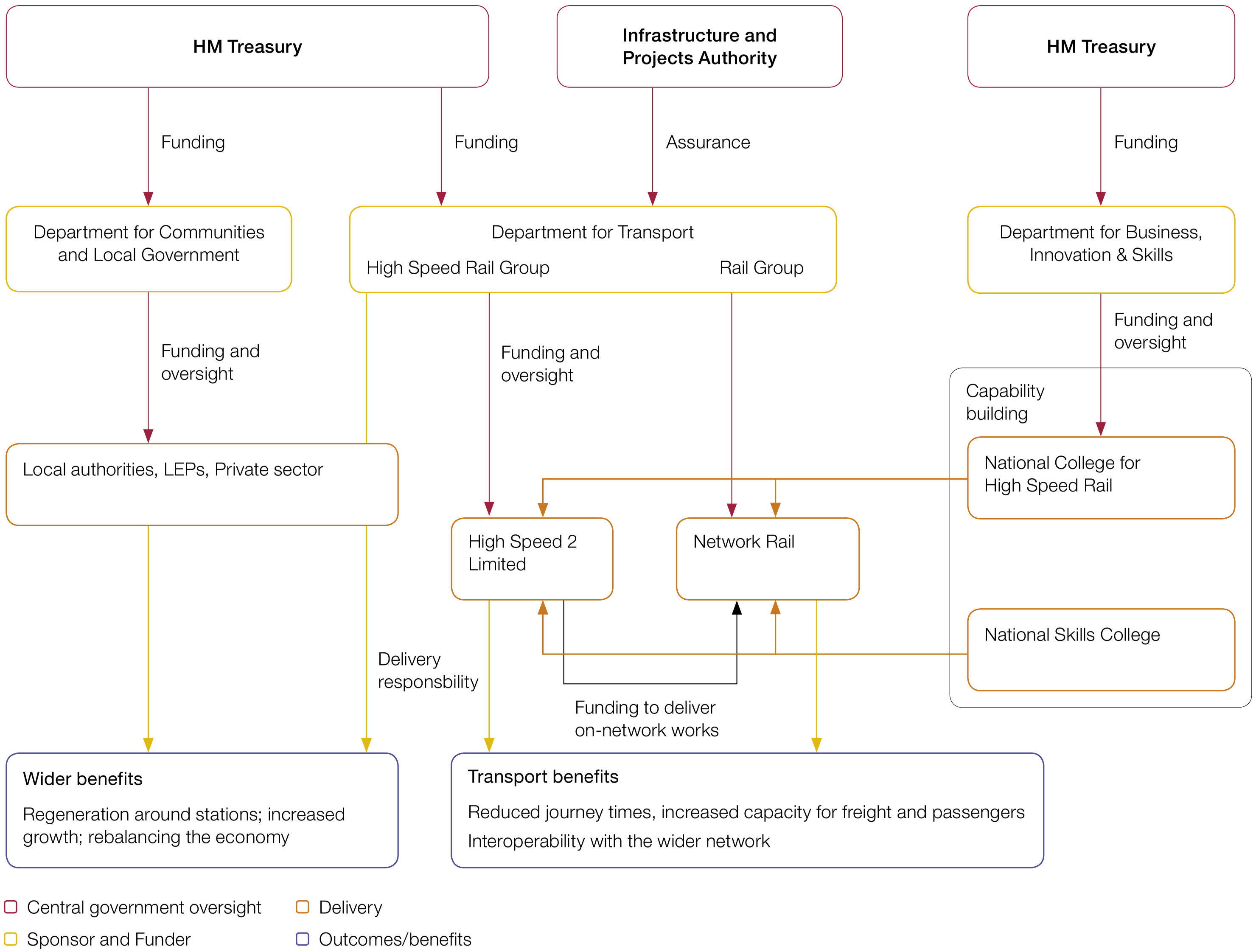
The programme delivery and governance structure

1.9 The Department for Transport is responsible for funding and sponsoring the programme, and is ultimately accountable for successful delivery of the benefits. In 2009, the Department set up HS2 Ltd to deliver the programme and to maintain and manage the railway infrastructure once it opens. The overall success of the programme also depends on parties such as Network Rail, the Department for Communities and Local Government and the Department for Business, Innovation & Skills (**Figure 4** overleaf).

1.10 The Department and HS2 Ltd have signed a Development Agreement which sets out their respective roles and responsibilities, sets out the sponsor's requirements, and outlines the arrangements for providing HS2 Ltd with funds to deliver the work, as well as the governance arrangements and terms under which the Department would require HS2 Ltd to improve performance.

1.11 The Department and HS2 Ltd have established a clear governance model for the programme. At a high level, the programme reports into a programme board, and major investment decisions are required from the Department's Board Investment and Commercial Committee, with major decisions being approved by HM Treasury. The next level of the governance structure mirrors both the Department's and HS2 Ltd's management structure, with separate boards for phases 1 and 2, and a further board overseeing progress with plans for the operational railway, including trains and depots. As with other major transport programmes such as Crossrail and High Speed 1, the Secretary of State has appointed a Project Representative (P-Rep) to sit in HS2 Ltd and provide assurance about progress with the programme. (**Figure 5** on page 17).

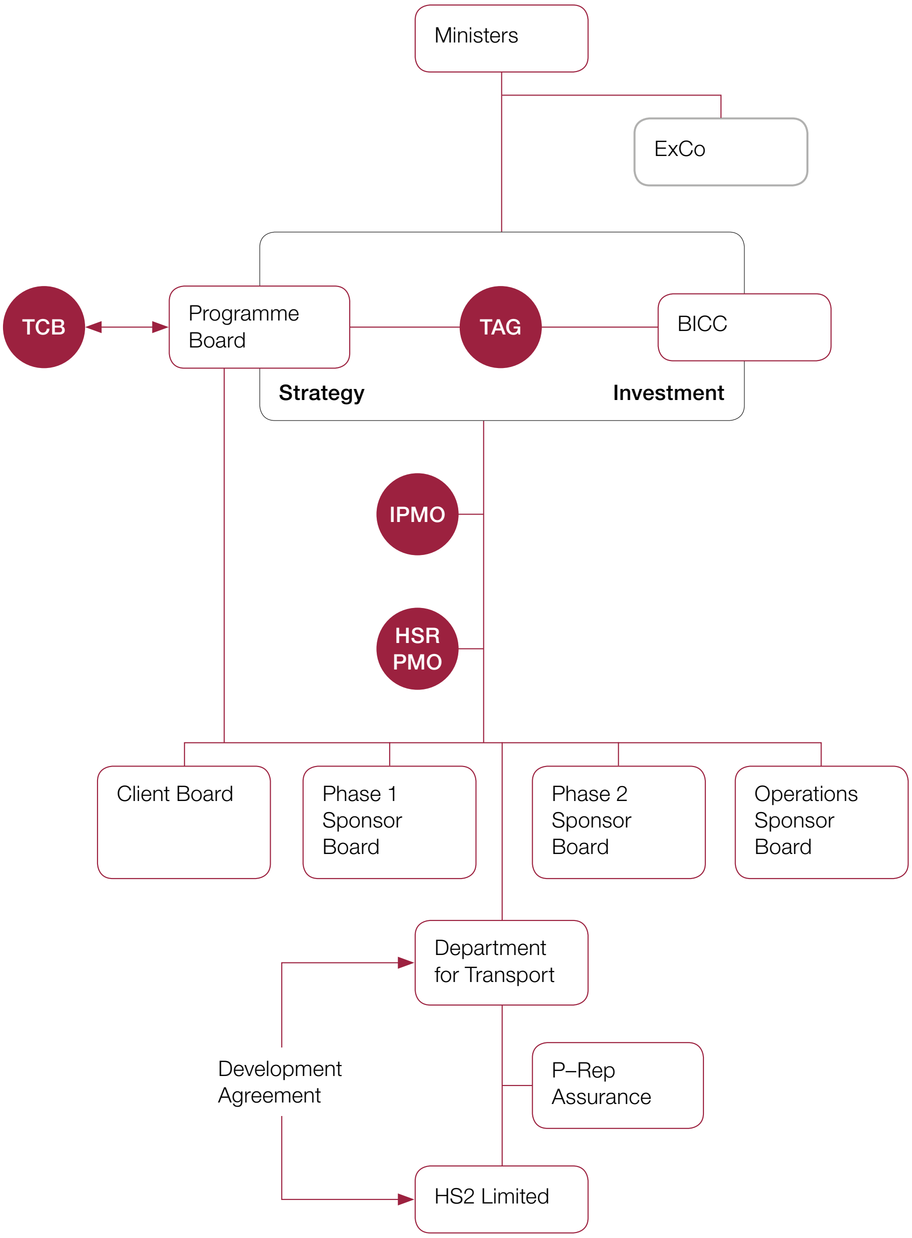
Figure 4
Programme funding and delivery structure



Source: National Audit Office

Figure 5

Overview of core programme governance



Notes

1 TCB – Tripartite Cooperation Board.

2 TAG – Tripartite Analytical Group.

3 IPMO – Integrated Programme Management Office.

4 HSRPMO – High Speed Rail Programme Management Office.

5 P–REP – Project representative.

6 ExCo – Executive Committee.

Source: National Audit Office

1.12 The development agreement sets out a requirement for a series of review points which HS2 Ltd must pass through to be progressively granted increasing levels of autonomy to procure contractors and award contracts. This autonomy is important for enabling the delivery body of a programme to deliver in an efficient way with reduced intervention from the programme sponsor. High Speed 2 has three formal review points covering phase 1:

- Review Point 1, to delegate authority to commence procurement of the main infrastructure works, up to contract award stage. In June 2015, the completion date for this review point was extended to April 2016, following an intermediate review of HS2 Ltd capability in September 2015.
- Review Point 2, to delegate authority to award infrastructure contracts. This is scheduled for April 2017.
- Review Point 3, to delegate authority to commence construction work. This is scheduled for April 2018.

The review point process for phase 2 is yet to be decided.

1.13 In May 2016, 10 months later than the original target date for completion of the review point, the Secretary of State decided not to grant HS2 Ltd the formal delegated authority to issue tender documents for main civil engineering contracts itself. The review showed that HS2 Ltd had demonstrated the required capabilities to pass the review point, but that further work was required to finalise the baseline cost estimate and programme schedule. After carrying out assurance work, the Department and HM Treasury decided that HS2 Ltd could issue the tender documents in order to avoid any negative impact on the critical path of the programme. HS2 Ltd issued the documents in June 2016.

1.14 The remainder of this report looks at:

- the estimated costs of the programme (Part Two);
- the current position on the programme schedule (Part Three); and
- progress with preparations for delivering programme benefits (Part Four).

Part Two

The costs of High Speed 2

2.1 In the 2015 spending review, the Department and HM Treasury agreed long-term funding for High Speed 2 of £55.7 billion in 2015. Understanding and controlling the costs of the programme is an important part of delivering value for money. This part of the report looks at:

- the current cost estimates for phase 1; and
- risks to the affordability of phase 2, and plans to reduce costs.

Cost estimates for phase 1

2.2 Cost estimates for phase 1 are much more developed than at the time of our 2013 report. The Department and HS2 Ltd now have a baseline, using experience from recent rail infrastructure programmes, which brings together cost and schedule against which they plan to monitor progress. The baseline for phase 1 includes the main cost categories that we would expect to see for a major rail infrastructure programme, including provisions for rolling stock and depots, and preparatory work on the existing network.

2.3 In June 2016, the estimated cost of delivering phase 1 including rolling stock (£27,384 million in 2015 prices) exceeds the available funding by £204 million.[3] This estimate assumes, that the Department and HS2 Ltd secure cost saving of £1,470 million (**Figure 6** overleaf). The Department and HS2 Ltd have agreed a plan for how it will secure £1,470 million of savings in phase 1. This includes:

- value engineering (finding more efficient designs that reduce the amount of work required without affecting benefits); and
- implementing more efficient ways of working, such as implementing a building information management system (BIM), which is a standard process on all government construction projects, designed to make design and construction more efficient.

It is good practice to continually review a programme to identify possible efficiencies and HS2 Ltd has also identified further opportunities for additional savings of around £550 million, although there are not yet firm plans for how these savings will be achieved.

3 Anticipated final cost is the point estimate cost plus estimated contingency requirement calculated at a level of 95% certainty that costs will not exceed the anticipated final cost.

Figure 6
Phase 1 cost estimates and available funding

	2015 spending review (£m)	June 2016 (£m)
Point estimate	21,652	22,272
Planned phase 1 efficiency savings	1,495	1,470
Phase 1 post efficiency point estimate	**20,157**	**20,802**
Estimated contingency requirement	7,023	6,582
Anticipated final cost[1]	**27,180**	**27,384**
Available funding	**27,180**	27,180
Difference between anticipated final cost and available funding	**0**	**204[2]**

Notes

1 Anticipated final cost is the point estimate cost plus estimated contingency requirement calculated at a level of 95% certainty that costs will not exceed the anticipated final cost.

2 £204 million is the difference between available contingency in June 2016 of £6,378 million and estimated contingency requirement of £6,582 million.

Source: National Audit Office analysis of Department for Transport information

2.4 The commercial approach to the main civil engineering contracts could help generate further cost savings by incentivising contractors to deliver for less than the cost estimate. **Box 1** summarises the main elements of the commercial approach.

Box 1
HS2 Ltd's commercial approach to the main civil engineering contracts for phase 1

HS2 Ltd engaged the market early – around two years before the beginning of the procurement process, which is good practice. The approach seeks to benefit from the experience of the industry by splitting the contracts into two stages. For the first stage, the contractors will be required to work with HS2 Ltd to develop the design and method of construction so that forecast costs are reduced and opportunities to improve to deliver more quickly are identified. The second stage will be to finalise designs and carry out the construction. The commercial approach includes mechanisms for both contractors and the programme to benefit from any savings against the budgeted price of the contract. This approach has resulted in strong interest from the market and the shortlist includes joint ventures with extensive experience of high speed rail internationally, and of major infrastructure and rail programmes.

2.5 The point estimate for the costs of phase 1 have increased by £620 million since the November 2015 spending review. The most significant is a 220% increase in the estimated cost of compensating Network Rail and train operating companies for reduced revenue and performance while HS2 Ltd carries out work on sections of the network. This is based on greater understanding of the likely scale of disruption during construction of phase 1. Other changes in estimated cost are the result of more detailed planning, such as an increase of 12% in the estimated cost of building the stations.

2.6 These cost increases have been partially accommodated by reducing the amount of contingency available to manage future risks to the programme. Contingency should be used to manage risks to the programme as they materialise. However, HS2 Ltd has moved funding from contingency to the point estimate with the net effect that the contingency available to manage programme risks has reduced from £7,023 million at the 2015 spending review, around 36.5% of the estimated cost of work remaining, to £6,378 million, or 32.4% of the estimated cost of remaining work. The Department's aspiration is for phase 1 infrastructure to have 35% contingency and the relatively low level of contingency is one reason why the Department decided not to allow HS2 Ltd to pass the first review point.

2.7 As the programme moves into construction it will be important that the remaining contingency is protected and used to manage risks as they materialise, not to cover the cost of increases in cost estimates or for un-costed scope changes. Effective management of the programme's finances depends in part on contingency being allocated to the level of the programme where the related risks can best be managed, and on maintaining tight control on the use of contingency. The Department and HS2 Ltd are currently working on an approach to allocating and managing contingency, which must be in place before major contracts are awarded.

The affordability challenge on phase 2

2.8 The cost estimates for phase 2 are much less developed than those for phase 1. HM Treasury has confirmed long-term funding for phase 2 of £28,546 million, including rolling stock and £7,853 million of contingency. Because phase 2 is at a much earlier stage, the contingency for phase 2 infrastructure is not based on a detailed quantification of risk (although rolling stock contingency estimates are), but represents a 40% uplift to account for optimism bias, in line with Treasury guidance.

2.9 At the time of the spending review, cost estimates for phase 2 were some £7 billion higher than available funding. However, the Department decided not to request additional real term funding, but instead committed to delivering the programme within agreed funding. The Department and HS2 Ltd have been taking steps to reduce cost estimates to make the programme affordable. By May 2016, HS2 Ltd had agreed savings of around £2.1 billion through changes to the planned route and reductions in the estimated cost of property acquisition.

2.10 In March 2016, the Cabinet Secretary asked the Infrastructure and Projects Authority to assess options for significant savings from High Speed 2, without making major scope changes. The review confirmed the savings already identified on phase 1. On phase 2, the Infrastructure and Projects Authority, working with the Department and HS2 Ltd, has identified around £6.2 billion of potential savings, including:

- around £2 billion from applying unit cost assumptions used in the more mature phase 1 cost estimates;
- around £1.7 billion from higher productivity from contractors; and
- £539 million from reducing the programme management overhead of HS2 Ltd.

2.11 The Department and HS2 Ltd have identified potential further savings through a change to the planned route of phase 2.

2.12 Under current plans, High Speed 2 will stop at Meadowhall, north of Sheffield, but there are ongoing discussions about providing HS2 services into the station in Sheffield City Centre. The Department and HS2 Ltd are exploring options to locate the HS2 stop in the city centre which they believe could save around £768 million, and make a significant contribution to meeting the affordability challenge for phase 2b. HS2 Ltd's analysis suggests that this will not have a substantial negative impact on the overall benefit–cost ratio for the programme. It could, however, mean that a different set of communities will be affected by the plans than under the currently planned route and station location. The Department expects the Chairman of HS2 Ltd, Sir David Higgins to make a recommendation about the location of the Sheffield station later in summer 2016. It will be important that the final decision about the location of the station is well informed by an understanding of the possible impacts on the potential growth and regeneration benefits and on the wider rail system. **Figure 7** summarises the current position on phase 2 costs and proposed savings.

Figure 7
Phase 2 cost and proposed savings

	£ million
Phase 2 agreed funding (infrastructure and rolling stock, excluding contingency)	20,694
Cost estimate at 2015 spending review (infrastructure and rolling stock, excluding contingency)	27,668
Total required savings 2015 spending review	**6,974**
Secured savings	
Agreed route changes and value engineering	1,760
Land and property acquisition	370
Total secured savings	**2,130**
Proposed savings	
Proposed route change (Sheffield)	768
Updated unit costs for viaducts, embankments and stations	2,440
Supply chain efficiencies	1,680
Income opportunities	260
Additional efficiency savings	320
Other (including HS2 Ltd programme management overhead)	1,190
Rolling stock savings	360
Total proposed savings	**7,018**
Total savings	**9,148**

Source: National Audit Office analysis of Department for Transport data

2.13 The Department has asked HS2 Ltd to incorporate the efficiencies and cost savings in its next cost estimate. Savings will not be realised until the programme is delivered, and there is potential for cost estimates for phase 2 to change again as planning progresses, as we have seen on phase 1. The current estimate for phase 2 contains significant assumptions and excludes scope that may be required to meet the programme's objectives. Changes to these assumptions or adding scope to the programme would make it more difficult to deliver phase 2 within the allocated funding. Some of the assumptions are set out below:

- The government has signalled its support for a major hub station at Crewe to improve connectivity but this investment, which the Department estimates will cost up to £500 million, is currently unfunded.
- It is assumed that the proposed station at Manchester Airport will be paid for by third party sources. In the early stages of Crossrail a similar assumption was made that Heathrow would pay £230 million towards the cost of Crossrail. In January 2014, the Civil Aviation Authority determined that Heathrow airport should only contribute £70 million.

2.14 Some of the proposed savings were the result of a review into why high speed rail projects in other countries cost less than in the UK, which was commissioned by HS2 Ltd in 2015. This report identified a range of savings opportunities, but also pointed out that much of the disparity in costs is due to the fact that overseas high speed rail programmes tend to be narrower in scope than High Speed 2. For example, they tend not to have the added cost, risk and complexity of building in built-up areas. HS2 Ltd has incorporated some of the ideas, including more efficient procurement practices and supply chain management, from this review into projects to reduce costs on both phases 1 and 2.

2.15 It will be challenging to achieve some of the proposed savings. The Department currently has a high level of confidence in achieving around £4.5 billion of the £7 billion of potential savings identified. Plans for reducing the cost of HS2 Ltd and for reducing required contingency by resolving known risks, for example, require further development, and proposed savings from the supply chain will require the Department to influence how the construction and engineering industries do business. If the savings prove difficult to deliver, or if other cost estimates increase without savings elsewhere on the programme, the Department and HS2 Ltd may have to either:

- use contingency to cover increases in costs or new scope other than the management of identified and quantified risks, which could reduce HS2 Ltd's ability to manage risk;[4]
- seek additional sources of funding, including from HM Treasury; or
- make further changes to the scope of the programme, which could reduce benefits.

Box 2 highlights some of the strategies used to contain costs on the Crossrail programme.

Box 2

Crossrail took steps to bring cost within available funding under control before construction began

In January 2010, Crossrail Limited estimated that total costs would be £17.8 billion, £1.9 billion more than the £15.9 billion available. Crossrail Limited was eventually able to reduce estimated costs to £14.8 billion by:

- re-sequencing the programme;
- simplifying work to integrate different elements of the programme;
- reducing scope by, for example, deciding not to create a direct connection from Crossrail to the District and Circle Line platforms of the London Underground at Paddington Station;
- lowering the costs of inflation to reflect the impact of the recession upon economic forecasts; and
- agreeing contracts with lower target prices, as a result of the global recession which encouraged construction companies to deliver very competitive bids.

Source: Comptroller and Auditor General, *Crossrail*, Session 2013-14, HC 965, National Audit Office, January 2014

4 There is a provision of £219 million in the contingency for phase 1 to manage the risk that some efficiency savings are not realised.

2.16 Should the efficiency savings on either phase 1 or phase 2 not be delivered, the benefit–cost ratio for the programme could reduce. The Department and HS2 Ltd's economic appraisal assumes that they will deliver the programme for significantly less than its available funding. Information set out in the economic case for the programme suggests that if phase 1 were to be delivered for close to its available funding the benefit–cost ratio for phase 1, including economic impacts, would reduce to 1.5 from 1.7. This would represent low to medium value for money in the Department's classifications. The Department has asked HS2 Ltd to review opportunities for scope savings across both phases of the programme that would bring cost savings and limit adverse impacts on benefits and functionality. There is a risk that significant changes to the scope of phase 2 aimed at reducing costs, could reduce benefits. It will be important to ensure that decisions are taken based on robust analysis of the quantified benefits and the wider strategic aims of the programme.

Part Three

The programme schedule and delivery readiness

3.1 The Department and HS2 Ltd have committed to an ambitious schedule for delivering the programme. Delivering the programme on time depends largely on whether both parties develop the required capability needed to manage a programme of this size and complexity, and manage effectively the key risks to the programme schedule.

3.2 This part of the report looks at progress towards gaining the powers to build phase 1 and how well placed the Department and HS2 Ltd are to deliver the next stage of the programme, in particular the construction of phase 1.

Progress with gaining the powers required to build phase 1

3.3 At the time of our 2013 report, the Department was aiming to gain Royal Assent by March 2015 for a Hybrid Bill granting powers, including powers of compulsory purchase of land and property to build phase 1 on the specified route. The Department decided that it needed to carry out more detailed planning work and introduced the bill to Parliament in November 2013. In September 2014, the Department changed the target date for achieving Royal Assent to December 2016, 21 months later than the original plan. It is sensible that the proposed legislative timetables for phases 2a and 2b are similar in length to the more realistic revised timetable for phase 1.

3.4 The Department and HS2 Ltd are now on course to achieve Royal Assent by the revised target date which will be a significant achievement. At 50,000 pages, the bill is one of the biggest ever considered by Parliament. The Department and HS2 Ltd have responded to around 2,600 petitions and a special select committee was required to consider the bill. The main changes resulting from the hybrid bill process included:

- removing a direct link between the High Speed 1 terminal near St Pancras and High Speed 2. The Department has committed to replacing it with an improved passenger walkway between the two stations, and making a funding contribution from the £55.7 billion funding package of up to £3 million; and
- an extension to the tunnel under the Chilterns.

3.5 Despite being on track to achieve Royal Assent by the end of 2016 a delay of more than three months could put the opening date at risk. This is because, for example, the programme schedule depends on being granted the powers, associated with obtaining Royal Assent, to acquire land and provide contractors with easier access to sites to carry out important ground investigation and survey work.

The forward look

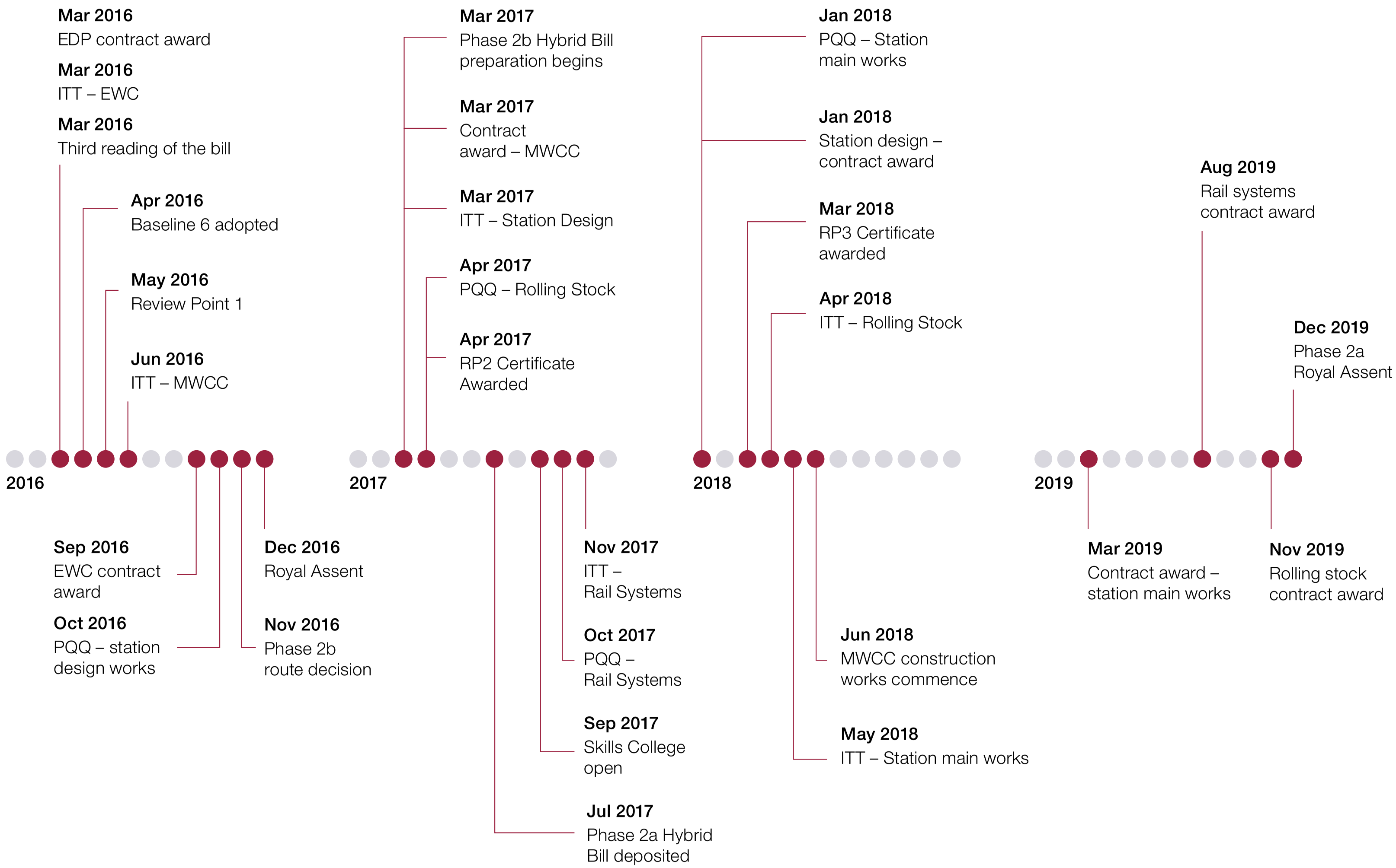
3.6 The programme is now moving at a fast pace with a number of key activities taking place over the next few years. On phase 1 the Department and HS2 Ltd need to procure contractors for major civil engineering work, begin procurement of stations, railway systems and rolling stock, and acquire around 11,000 separate packages of land (paragraphs 3.12 to 3.16). In addition, the Department and HS2 Ltd plan to agree and announce a route for phase 2 that is deliverable, affordable, will deliver promised benefits, and will integrate with the rest of the network, and draft the hybrid bills for phases 2a and 2b. The volume of concurrent activity and number of fundamental decisions which need to be made to a very tight schedule mean that the next few years are crucial to the programme (**Figure 8**). Across the programme as a whole, HS2 Ltd has missed 32% of planning and development milestones so far.

3.7 As Figure 8 shows, the overall programme schedule for the coming years requires governance bodies to make a large number of key decisions. Delays could be incurred if decision-makers need additional analysis to support recommendations. In addition, the Department will have to consider these decisions in context of their impact on the wider network (paragraphs 4.8 to 4.10). There is a risk that assurance suffers as decisions are sought quickly, which could result in insufficiently informed decisions being made now that could have far reaching effects on the programme.

3.8 It is important that HS2 Ltd builds and embeds the organisational capability, and produces fully assured plans to enable it to complete all this work on schedule and to a high standard. However, HS2 Ltd is currently behind the original timetable set by the Department for reaching the level of delivery readiness – including meeting defined capability levels and preparing a cost and schedule baseline – set by the Department. The Department now considers that the timetable it set HS2 Ltd was too ambitious and it has had to adapt its approach to gaining assurance about HS2's readiness. The Department and HS2 Ltd delayed the timetable for completion of the first of three formal review points – by ten months from July 2015 to May 2016. This was largely because HS2 Ltd needed to do significant amounts of work to prepare a baseline cost and schedule for phase 1. By May 2016, HS2 Ltd had met the capability requirements, but did not pass review point 1 due to ongoing concerns about cost and schedule.

Figure 8

Key programme milestones from 2016 to 2020



Notes

1 ITT – Invitation to tender.

2 PQQ – Pre-qualification questionnaire.

3 EDP – Engineering Delivery Partner.

Source: National Audit Office analysis of Department for Transport information

3.9 The main objective of review point 1 was for HS2 Ltd to gain delegated authority to carry out all procurement activity up to, but not including contract award without first having to seek approval from the Department and HM Treasury. By not gaining these delegations, all procurement milestones will therefore have to go through more governance and approval stages than originally anticipated, which adds time to the process. The Department and HS2 Ltd originally planned for HS2 Ltd to gain further delegated authority following successful completion of review point 2, scheduled for April 2017. The Department and HS2 Ltd are now reviewing the review point process and how future procurement approvals will be managed. With procurement activity accelerating during 2017, it is important that procurement is carried out efficiently. It is also important that a clear, thorough and realistic process for HS2 Ltd to gain delegated authority to deliver the programme is established, and for the Department to be able to focus on sponsoring and overseeing phase 1.

3.10 HS2 Ltd is currently at the start of a business transformation programme, designed to help it build and embed the organisational culture and capability – people, systems and processes – it requires, and to pass its review points. Maintaining focus on building capability while delivering phase 1, and developing phase 2 is a major challenge, and risks are starting to emerge. In particular, land and property acquisition has fallen behind schedule, partly as a result of having too few staff to meet the demand, and the volume of work required to develop the route plan and business case for phase 2 is placing a greater strain on resources than originally expected. **Box 3** sets out some of the key capability challenges that HS2 Ltd faces over the next two years.

Box 3

HS2 Ltd faces key challenges to building its capability to keep pace with the programme

People

HS2 Ltd is growing quickly, having recruited around 500 staff during 2015 and is set to grow by a further 300 during the next 12 months. This is at a time when there is a heavy demand for engineering, project management and commercial skills across the industry. HS2 Ltd has appointed an engineering delivery partner to strengthen project and programme management capability on phase 1.

HS2 Ltd is in the process of moving its staff from London to Birmingham, which will require a well-managed transition, and effective systems for ensuring collaboration between staff on multiple sites.

Systems

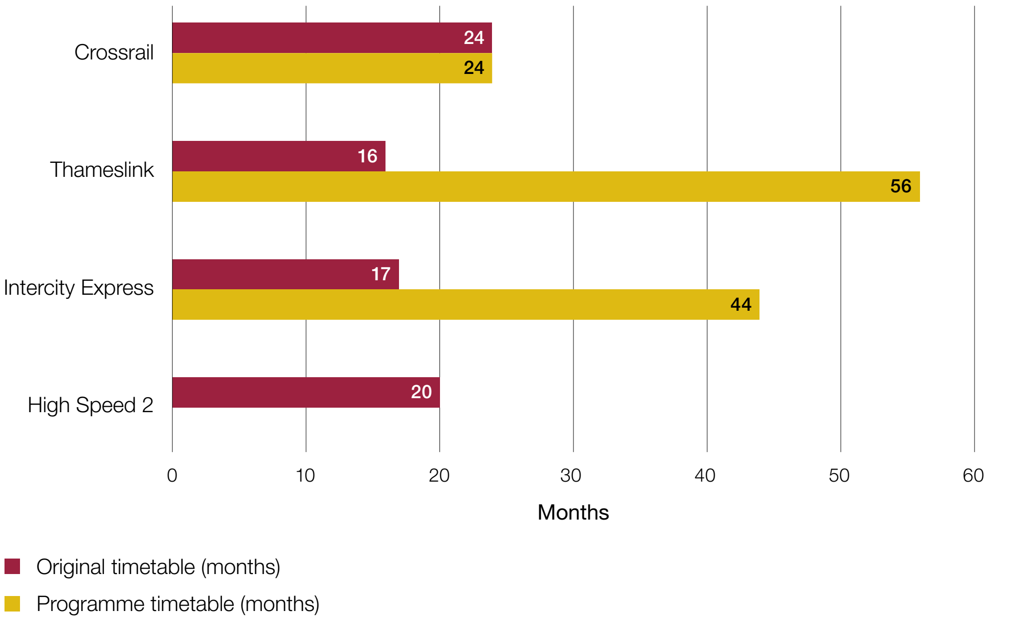
As part of the business transformation programme, HS2 Ltd need to complete the development and implementation of an automated management information system to help it collect and analyse up to date information on costs, schedule and risk from project managers and contractors.

HS2 Ltd has not yet developed an enterprise resource management system to suit the needs of the organisation when construction begins. This is crucial to manage the business effectively.

3.11 A critical decision for the programme schedule is whether to use public or private finance to pay for the trains and depots. The funding package agreed in consecutive spending reviews assumes that trains and depots will be publicly funded. Since 2012, the Department has commissioned two assessments of financing options, and HS2 Ltd commissioned a further review in 2015. All of these reviews have confirmed that public funding represents the best value for money. We understand the value of conducting a thorough analysis of all available options. However, the procurement of new trains for the Intercity Express and Thameslink programmes showed that negotiating the terms of private finance can take significantly longer than the two years currently allowed for procurement in the High Speed 2 schedule. Going down a private finance route now would increase the risk to opening phase 1 in 2026, delaying passenger benefits (**Figure 9**).

Figure 9

Timelines for the rolling stock procurement phases for the projects against plan



Notes

1 Comparison between the original timetable and the programme timetable from invitation to tender to contract award.

2 The funding strategy on Crossrail was changed from private to public funding.

3 Thameslink programme paused for five months due to a government review of all infrastructure projects during the spending review.

4 Intercity Express programme paused for seven months while an independent review on value for money was being carried out by Sir Andrew Foster.

Source: National Audit Office reports and Department for Transport information

3.12 The Department expects to present its overall strategy for trains and depots for phase 1 to the Department's Board Investment and Commercial Committee in autumn 2016, with the aim of starting procurement in April 2017 and awarding a contract in December 2019. The Department's current position is to use public funding. It is considering bringing in the private sector to refinance and take ownership of the train fleet, once the procurement is complete, partly to reduce the burden on the public balance sheet. The Department has not taken this route before, so the approach is untested. In our 2015 briefing *the choice of finance for capital investment*, we said that in the short term using private finance will reduce government debt figures, but over the longer term, as the original investment is repaid, additional public spending will be required to repay the debt and interest of the original investment.

The construction schedule for phase 1

3.13 Since our 2013 report, the overall schedule for the construction of the phase 1 infrastructure has tightened largely because it has taken longer than originally expected to develop plans for phase 1 and prepare the Hybrid Bill. The main civil engineering work is now scheduled to begin in mid-2018 rather than early-2017 when we last reported. The deadline for completing construction has also been brought forward by around 12 months to allow time for commissioning and testing the railway. The Department will gain powers of compulsory purchase on phase 1 when the Hybrid Bill receives Royal Assent. However, it planned to carry out some land assembly and ground investigation work in advance. It has completed 15% of ground investigation work against a target of 26%. The acquisition and assembly of land required to build the railway is critical to allow work to begin, but is also behind schedule.

3.14 HS2 Ltd has improved its confidence in opening phase 1 in December 2026 from 53% in November 2015 to 60% in April 2016, but this is still low given that major procurements are about to begin. The low confidence level is partly because the main activities in the phase 1 schedule have between 6 and 10 months of available time before the opening date is put at risk ('float'), whereas a higher level of float would be desirable to improve delivery confidence. The Department did not set HS2 Ltd a target for delivery confidence for this stage of the programme, but it has now asked HS2 Ltd to increase delivery confidence for opening phase 1 on schedule from 60% to 80%, while remaining within available funding. The Department has asked HS2 Ltd to develop proposals for how adding up to 12 months to the schedule might reduce costs and increase deliverability. Our reports on Thameslink, Crossrail, and Lessons from major rail infrastructure programmes illustrated the potential benefits from a willingness to adjust timetables in the face of cost and schedule pressures.

3.15 There is a particularly high delivery risk for some elements of phase 1. For example, the construction of the High Speed 2 station at Euston is a highly complex project which will need close cooperation between Network Rail, HS2 Ltd and train operating companies to minimise disruption to passengers and train services. The Euston project also involves the reconfiguration of Euston Underground station to enable it to cope with increased demand. The planned station at Old Oak Common that sits on the critical path is dependent on moving the existing depot for the trains run by the operator of the Great Western franchise from Old Oak Common. The current schedule assumes that HS2 Ltd gains access to the depot site on a phased basis from December 2017 but will require continued close engagement between the Department, HS2 Ltd and other stakeholders. In addition, HS2 Ltd will also need to move the Heathrow Express depot to a new site proposed at Langley.

3.16 High Speed 2 is dependent on Network Rail and other stakeholders delivering projects on the existing network in preparation for construction of the new railway. The Department and HS2 Ltd have agreed a programme of critical activity with Network Rail and there is provision in the funding package to pay for this work. Later in the year the Department, HS2 Ltd and Network Rail expect to sign an agreement (a 'protocol') which requires Network Rail to place the work it is required to carry out to support High Speed 2 at the same level of priority as its other infrastructure improvement works, and incentivises Network Rail to deliver to cost and schedule. Nevertheless, Network Rail has a challenging portfolio of work, some of which is facing significant cost and schedule pressure.[5] It is the Department's job to ensure that Network Rail's work is prioritised in a way that produces maximum benefit for both High Speed 2 and the wider network.

5 HC Committee of Public Accounts, *Network Rail's 2014–2019 investment programme*, Ninth Report of Session 2015-16, HC 473, November 2015.

Part Four

Preparations for delivering benefits

4.1 Delivering the promised benefits of the programme requires the railway to be built and operated as planned and integrated effectively with the existing network, and for local authorities to secure investment in areas around stations to help drive growth and regeneration. This part of the report looks at:

- the proposed benefits of HS2;
- accountability and responsibility for funding and delivering the benefits; and
- progress with preparations for delivering the benefits.

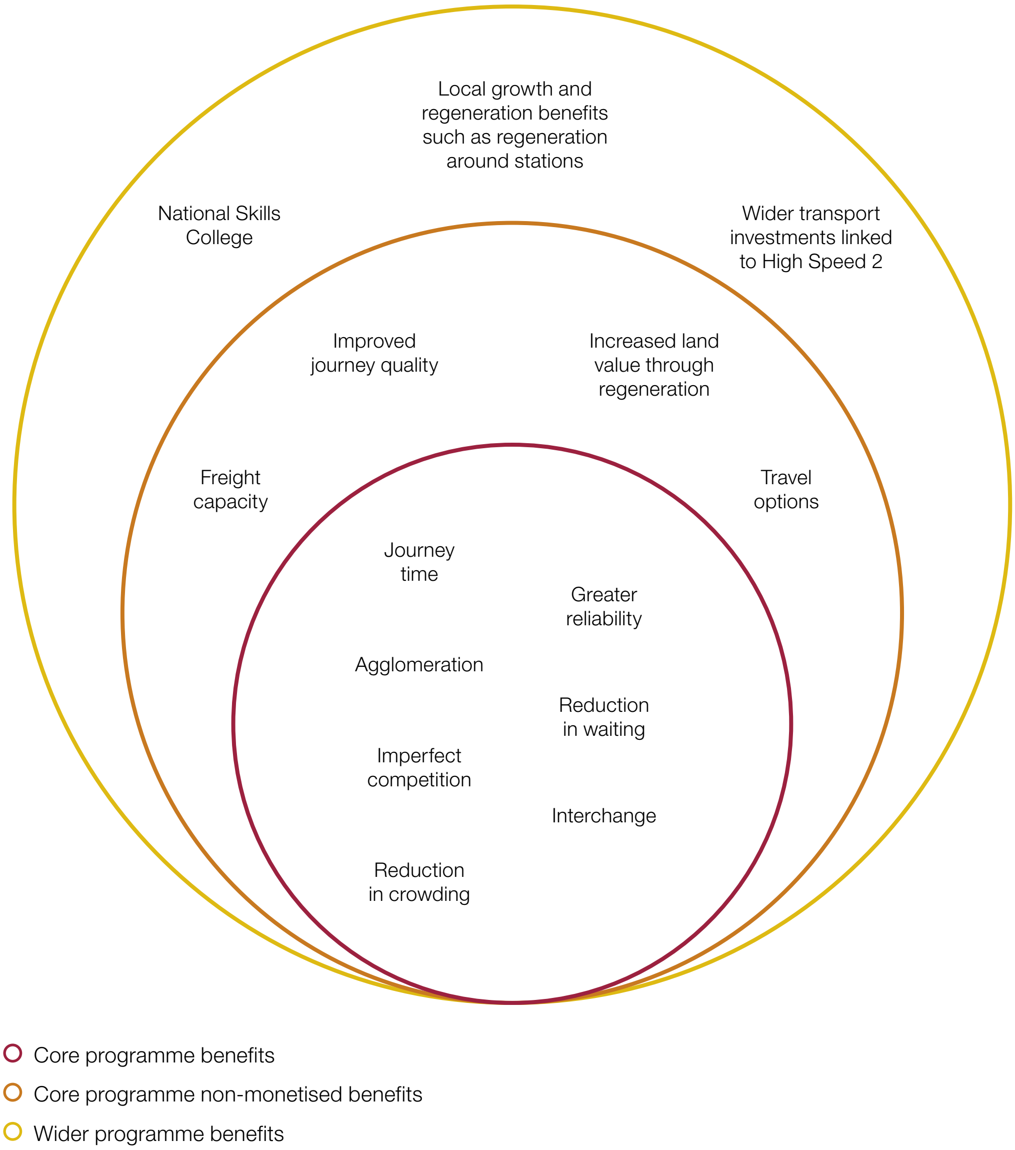
The benefits of High Speed 2

4.2 The Department has identified a range of benefits it aims to deliver to meet the programme objectives. For the purposes of structuring its approach to realising and measuring the benefits it has divided them into three main categories:

- transport benefits such as reduced journey times and crowding on trains, and related economic impacts, which are quantified as part of the economic appraisal in the business case;
- other transport benefits, such as improved journey quality, more freight capacity and more choice for passengers, which are not quantified as part of the economic appraisal in the business case; and
- wider benefits such as regeneration around stations and the proposed National Skills College, which are also not included in the economic appraisal. The first two categories of benefits are to be delivered through the £55.7 billion funding envelope (2015 prices), whereas the wider benefits are not.

Figure 10 sets out the main benefits in each category.

Figure 10
Core and wider programme benefits



Source: National Audit Office analysis of Department for Transport's data

4.3 Since we last reported in 2013, the Department has adjusted its methodology to reflect industry practice, and improved its presentation of the economic case. The Department and HS2 Ltd have modelled a range of scenarios using different assumptions and presented these as a range of possible outcomes, in addition to a single, core benefit–cost ratio. The Department has also used a revised value of productive time, based on updated analysis, which takes greater account of the fact that people increasingly work, and so remain productive, while travelling on trains. Since 2012, the benefit–cost ratio for the full network, including economic impacts has reduced from 2.5 to 2.2.

4.4 **Figure 11** shows the benefit–cost ratios for phase 1 and the full network, and **Figure 12** shows the distribution of benefit–cost ratios for the phase 1 and the full network, as presented in the economic case.

Figure 11

Changes in the core benefit–cost ratio since we last reported

	Phase 1 2012 Business case	Phase 1 2013 Business case[1]	Full network 2012 Business case	Full network 2015 Business case	Full network 2015 Phase 2a[1]
Benefit–cost ratio without wider economic impacts	1.4	1.4	1.9	1.8	1.8
Benefit–cost ratio with wider economic impacts	1.7	1.7	2.5	2.3	2.2

Note

1 The 2013 business case contains the most recent appraisal of phase 1 on its own. The November 2015 update for phase 2a contains the most recent appraisal of the full network.

Source: National Audit Office analysis of Department for Transport information

Figure 12

Ranges of possible benefit–cost ratios for phase 1 and the full network[1]

	Phase 1 2013 Business case[2] (%)	Full network 2015 Business case[2] (%)
Percentage of modelled scenarios with a benefit–cost ratio above 2 ('high')	12	95
Percentage of modelled scenarios with a benefit–cost ratio between 1.5 and 2 ('medium')	65	5
Percentage of modelled scenarios with a benefit–cost ratio below 1.5 ('low')	23	0.2

Notes

1 Including wider economic impacts.

2 The 2013 business case contains the most recent appraisal of phase 1 on its own. The November 2015 update contains the most recent appraisal of the full network.

Source: National Audit Office analysis of Department for Transport information

4.5 The larger proportion of benefits will not be delivered until phase 2 is complete. According to the economic case, transport benefits such as reduced crowding are distributed fairly evenly between phases 1 and 2, but two-thirds of forecast economic impacts will only be realised upon completion of phase 2. In addition, the broader objective of rebalancing the economy and generating local growth is dependent on local area strategies in the north and completion of phase 2 in 2033.

4.6 As new risks, opportunities and cost pressures emerge, and the impact of High Speed 2 on existing and future rail franchises becomes clearer, the benefit–cost ratio is likely to change. Changes to assumptions about, for example, passenger demand could also impact the business case, and other factors such as increased capacity on roads, new technology, and long-term trends in fuel prices could also impact demand growth. Benefits could also be affected by key decisions about the capacity of and journey experience on the trains, and decisions on the scope of phase 2. It will be important for the Department and HS2 Ltd to make key decisions on the programme with consideration of the impact of all these factors on the business case. The next iteration of the business case is due in autumn 2016, at the time of the route announcement for phase 2.

Accountability and responsibility

4.7 The Department and HS2 Ltd have recently developed a benefits management strategy which sets out who is responsible for funding and delivering the benefits:

- The Department is accountable for the delivery and funding of the programme's core benefits as set out in the business case. They must also work alongside other government departments to ensure delivery of the wider programme benefits. Through Rail Group's management and oversight of Network Rail and the wider rail system including franchises, the Department is also responsible for delivering benefits to the wider rail system and reducing negative impacts of High Speed 2.
- HS2 Ltd is responsible for delivering the core programme benefits such as reduction in journey times and release of capacity.
- The Department for Communities and Local Government is responsible for coordinating the delivery of local growth and regeneration benefits.
- Local Authorities, in partnership with others such as Local Enterprise Partnerships, are responsible for helping to create the conditions for driving regeneration activity and local growth benefits through predominantly private sector investment. There is a risk that these wider benefits will not materialise if funding cannot be secured.

4.8 On the whole, the High Speed 2 programme is not intended to cover delivering benefits associated with local growth and regeneration, which sit outside of the business case. The main exception is Euston. The High Speed 2 funding package covers the cost of the reconfiguration of Transport for London's underground station to enable it to cope with increased demand resulting from High Speed 2. The Department for Transport also plans to carry out work to enable development above the site of the High Speed 2 station at Euston, with an estimated funding requirement, including contingency, of £417 million (2015 prices).There is currently no agreed funding for redevelopment of the existing mainline station. (**Figure 13**).

Figure 13

Accountability and funding responsibility to realise programme benefits

	Core programme benefits		Wider programme benefits	
Accountability	High Speed Rail SRO		Department for Transport (DfT) SROs	Government or other public body SROs
Responsibility	HS2 Ltd Chief Executive	DfT/delegated transport bodies senior officials	DfT/delegated transport bodies senior officials	Central or local government or other public body officials
Funding category	Category 1	Category 2	Category 3	Category 4
Description	Benefits delivered by HS2 Ltd to deliver the Sponsor Requirements under the Development Agreement in response to the business case	Benefits delivered by DfT in response to the business case	Benefits delivered by DfT (or other transport bodies) in response to the HS2 programme	Benefits delivered by central and local government and other public sector bodies in response to the HS2 programme
Example benefits	Reduction in generalised journey time from HS2	Reduction in generalised journey time from released capacity	CP6 investments in response to HS2	Increased development around HS2 stations
	Benefits delivered under the £55.7 billion funding envelope		Benefits delivered outside the £55.7 billion funding envelope	

Source: Department for Transport

Progress with delivering benefits on the wider network

4.9 HS2 Ltd's 2014 report *Rebalancing Britain: From HS2 towards a national transport strategy* laid out the vision for an integrated transport system with High Speed 2 at its heart. High Speed 2 will have an impact on large parts of the existing rail system both during its construction and when it is operational. Managing the wide range of interdependencies between High Speed 2 and the wider system, and integrating the programme with other rail investment programmes is a huge challenge.

4.10 It encouraging that both the Department and HS2 Ltd have learned lessons from previous programmes and have established teams tasked with developing plans for how the railway will operate at an early stage in the programme. However, the impact of, for example, the design of the trains for High Speed 2 on rail infrastructure and services on the wider network are now being assessed. The Department, which is responsible for providing value for money across the whole rail system, has identified that it needs to strengthen how its High Speed Rail Group works with its Rail Group, which is responsible for infrastructure and services on the existing network. It has recently set up a new team to help manage the interfaces between High Speed 2 and the wider rail system and promote more joined-up decision-making. **Box 4** illustrates some of the key decisions affecting the wider rail system which need to be made.

Box 4
High Speed 2 will have a major impact on the existing rail system

- The Department and HS2 Ltd developed the programme on the assumption that High Speed 2 trains would not have the capability to tilt to maintain speed on the existing network. However, this results in speeds lower than those achieved by tilting trains on the West Coast Mainline existing network meaning that infrastructure improvements are required to prevent existing services having to slow down. In 2016 it was identified that the original assumptions about the extent and cost of infrastructure improvement on the existing network needed to be developed further.
- High Speed 2 will have an impact on a large number of rail franchises with potential loss of value to some franchise businesses. When phase 1 of High Speed 2 opens in 2026, timetables for a range of franchises will need to change, and revenues from franchises could fall or rise as a consequence. The Department has recently begun looking at how the additional capacity on the existing network created by High Speed 2 can be used effectively. HS2 Ltd has only recently become a full member of the Rail Delivery Group, the body that coordinates the views of train operating companies, and the full impact of the railway on existing franchise businesses is not yet fully understood.
- There is uncertainty about the level of disruption that construction work on phase 1 will cause to franchises, particularly the InterCity West Coast franchise. In November 2015, the Department decided to push back the competition for the InterCity West Coast franchise by a further six months to June 2016, in order to align the InterCity West Coast franchise with High Speed 2. The Department is now looking at options for how to get value for money from the next franchise during High Speed 2 construction.
- The Government has announced plans for investment in transport in the north, including a high speed rail link across the Pennines. High Speed 2, particularly phase 2, will need to fully integrate with plans for future rail investment.
- The business case for High Speed 2 sets out that one of the main benefits of the programme is that capacity will be released on the west coast mainline for more freight transport and commuter services. However, it is likely that capacity will be created across the rail network. The Department has commissioned a piece of work looking at how to make best use of this additional capacity, but it is currently at an early stage.

4.11 The challenge of managing the interdependencies on the wider network should be supported by the Department's first attempt at producing an overall strategic vision for the rail system in the UK. While it is encouraging that this is now being produced, we and the Committee of Public Accounts have been recommending that such a strategy be developed for some time and some of the challenges the Department is now facing could have been made easier if this had been completed earlier.

Progress with delivering regeneration and local growth benefits

4.12 On High Speed 1, the lack of leadership from central government resulted in the government not delivering the promised regeneration benefits in Ebbsfleet as quickly as originally planned.[6] The Department has learned from the lessons of High Speed 1 and has made a good start to planning for delivery of the regeneration benefits. This work began with Lord Deighton's 2014 Growth Taskforce report. Since then the Department for Communities and Local Government has established a dedicated HS2 Local Growth Team. A programme board oversees coordination of growth and regeneration benefits. The Department and HS2 Ltd also have teams to look at delivery of programme benefits.

4.13 Local authorities and combined authorities affected by the route are developing High Speed 2 growth strategies which set out the projects needed to maximise the benefits of High Speed 2 and tie-in with broader growth activity in the regions. Growth strategies for the areas affected by phase 1 are well advanced. For example:

- The Old Oak Common and Park Royal Development Corporation (OPDC) is developing a masterplan for the area that incorporates transport investment from Crossrail and High Speed 2. The government has agreed in principle to transfer land owned by the Department for Transport and Network Rail to the Development Corporation to support this development.
- The West Midlands Combined Authority, is developing plans to implement its strategy. The Authority estimates that the cost of its planned work could be around £3 billion to £4 billion. The plans include improving connectivity between the two West Midlands stations at Birmingham Curzon Street and Birmingham Interchange, and the wider region, investment in areas around the two stations, and work to support business, improve skills and capitalise on employment opportunities provided by, for example, the planned maintenance depot at Washwood Heath.

6 Paragraph 5.3 from the National Audit Office report *Lessons from major rail infrastructure programmes* (HC 267, 2014-15).

Annex

High Speed 2: a review of early programme preparation (2013)

Committee of Public Accounts recommendations	Current position
The Department should publish detailed evidence which clearly shows why it considers High Speed 2 to be the best option for increasing rail capacity into London, improving connectivity between regional cities and rebalancing the economy.	The strategic context and the objectives of High Speed 2 are clearer than when we last reported, following the update of the business case for High Speed 2 in 2013, and the Supplement to the Strategic Case published in 2015. HS2 Ltd also developed in 2014 the *Rebalancing Britain: From HS2 towards a national transport strategy* report, which positions High Speed 2 as a catalyst for the rebalancing of the national economy.
The Department's decision on phase 2, due by the end of 2014, should be based on a business case for the Y-network prepared using up to date information and realistic assumptions, particularly on the benefits to business travellers.	In late 2013 the Department updated its approach, including revising its assumptions about value of time. Business cases for each phase remain separate but the interdependencies are actively managed by the Department.
The Department should allocate its contingency allowance to specific risks to the programme to justify the large amount it has set aside for unexpected costs. It should also set out the processes it will use to keep tight control over the use of the contingency allowance.	The Department and HS2 Ltd are currently working on its approach to allocating and managing contingency. Understandably, contingency and risk management is well developed for phase 1; less so for phase 2.
The accounting officer should assure himself and advise ministers on whether the Department and HS2 Ltd can deliver both the bill and the programme as a whole within the set timetables and to a high standard.	The Department and HS2 Ltd are on course to achieve the revised deadline for the hybrid bill. The programme schedule is tight.
The Department should set out how and by when it will secure the right level of resources and mix of expertise to enable it to oversee a programme of this magnitude, and challenge HS2 Ltd and its contractors effectively.	Both DfT and HS2 Ltd have resourcing pressures and there remains a scarcity of commercial and programme management skills in the industry.

Source: HC Committee of Public Accounts, *High Speed 2: a review of early programme preparation*, Twenty-second Report of Session 2013-14, HC 478, September 2013

Annex *continued*

Lessons from major rail infrastructure programmes (2015)

Committee of Public Accounts recommendations	Current position
The Department should set out a long-term strategy covering the next 30 years for transport infrastructure in the UK, and use this strategy to inform decisions about investment priorities.	The Department produced a strategic vision for the rail system in the UK. However, it has not, so far, paid close enough attention to the impact of High Speed 2 on the existing network, and on existing franchises.
The Department should apply learning from its previous projects and from overseas to speed progress and improve value for money to all projects it sponsors, including High Speed 2.	In 2015, the Department commissioned a report to analyse rail projects in other countries. The Department has incorporated some savings from this report to its projects to reduce costs on both phases 1 and 2. The Department has drawn on lessons from previous projects in the development of its approach to benefits realisation.
The Department should set out how it will control use of contingency on High Speed 2 and other projects, to provide assurance that generous contingency funds will not be used to hide cost overruns.	The Department and HS2 Ltd are currently working on its approach to allocating and managing contingency. Because phase 2 is at a much earlier stage, the contingency is not based on a detailed quantification of risk.
The Department should work with industry and with other departments responsible for major infrastructure programmes to understand gaps in industry capacity, and put in place plans to manage any gaps to ensure all programmes can be delivered on schedule and within budget.	
The Department should set out who is responsible for ensuring that benefits are realised, and how that work will be coordinated.	The Department and HS2 Ltd have developed a Benefits Management Strategy setting out the approach to delivering benefits and defining who is responsible for funding and delivering the benefits.

Source: HC Committee of Public Accounts, *Lessons from major rail infrastructure programmes*, Twenty-eighth Report of Session 2014-15, HC 709, January 2015

Appendix One

Our audit approach

1 This study examined whether the Department for Transport (the Department) is managing the High Speed 2 programme effectively to drive value for money. Our key areas of review were:

- the programme's objectives and recent developments;
- the costs of High Speed 2 and available funding;
- the programme's schedule and delivery readiness; and
- progress with preparations for delivering the benefits of the programme and the key risks to be managed to protect value for money.

2 Our audit approach is summarised in **Figure 14** overleaf. Our evidence base is described in Appendix Two.

Figure 14
Our audit approach

The objective of government

To provide sufficient capacity to meet long-term demand for transport, and to improve resilience and reliability across the network; and improve connectivity by delivering better journey times and making travel easier. More broadly, the government intends to help support economic growth and make a major contribution towards rebalancing the economy.

How this will be achieved

The Department plans to create a new high speed rail service between London via Birmingham to Manchester and Leeds.

Our evaluative criteria

The Department and HS2 Ltd have programme costs and schedule under control.

The HS2 programme is at the level of readiness that we would expect at this stage in the programme.

The Department and HS2 Ltd have clear plans and processes in place to deliver the strategic benefits of the programme.

Our evidence

(see Appendix Two for details)

We assessed whether costs were under control by:

- carrying out interviews with the Department and key stakeholders; and
- reviewing Departmental documents, published materials and other sources on the programme, including third party evaluations.

We identified whether the programme was at the required level of readiness by:

- interviews with the Department and key stakeholders;
- reviewing Departmental documents, published materials and other sources; and
- applying the NAO audit framework on commercial and contracting practices.

We evaluated the plans to deliver the programme's benefits by:

- interviews with the Department and key stakeholders including local government; and
- reviewing Departmental documents, published materials and other sources.

Our conclusions

Since we reported in 2013 the Department and HS2 Ltd have made significant progress in preparing to deliver the programme. However, HS2 Ltd has struggled to meet the overly ambitious timetable set for it by the Department for building delivery readiness, while also developing the programme. This will add to the challenge of delivering an already ambitious programme over the next few years. The programme is now facing cost and schedule pressures and, in response, the Department and HS2 Ltd are considering the impact of extending the phase 1 schedule by up to twelve months. Unless the Department and HS2 Ltd make forthcoming decisions promptly, with greater realism about timetables and full understanding of the trade-offs between cost, schedule and benefits, including the impact on the wider network, value for money will be at risk.

Appendix Two

Our evidence base

1 Our conclusions on whether the Department for Transport (the Department) is managing the High Speed 2 programme effectively, to drive value for money, were reached following our analysis of evidence collected between March and June 2016.

2 Our audit approach is outlined in Appendix One.

3 We examined whether the department and HS2 Ltd have programme costs and schedule under control:

- We undertook **interviews** with stakeholders, including: the Department (staff from the High Speed Rail Group, staff from the Passenger Services and wider Rail Group functions); HS2 Ltd; and the Rail Delivery Group (industry body representing train operating companies).
- We reviewed **documentary evidence** on the Baseline 6 cost and schedule data for the programme, from the Department. We also reviewed external reviews of costs and schedule including an international benchmarking study for high speed rail oversees.

4 We examined whether the High Speed 2 programme is at the level of readiness that we would expect at this stage in the programme:

- We discussed the underlying capability of the Department and HS2 Ltd with key stakeholders as part of our **interviews.**
- **Discussions with senior management** were held to understand how the assurance and governance processes for the programme have evolved since we last reported.
- We **reviewed key strategic documents** that the Department and HS2 Ltd provided on delivery of the programme, to assess clarity and rationale.

5 We examined whether the Department and HS2 Ltd have clear plans and processes in place to deliver the strategic benefits of the programme:

- We reviewed the business case and strategic documents that the Department and HS2 Ltd provided.
- We conducted interviews with the Department and HS2 Ltd to discuss their plans to the wider programme.
- We engaged with local authorities and other departments such as the Department for Communities and Local Government and the Department for Business, Innovation & Skills to assess their involvement in the wider programme.

This report has been printed on Evolution Digital Satin and contains material sourced from responsibly managed and sustainable forests certified in accordance with the FSC (Forest Stewardship Council).

The wood pulp is totally recyclable and acid-free. Our printers also have full ISO 14001 environmental accreditation, which ensures that they have effective procedures in place to manage waste and practices that may affect the environment.

National Audit Office

£10.00

ISBN 978-1-78604-056-5

Design and Production by NAO External Relations
DP Ref: 11132-001