National Audit Office

Report
by the Comptroller
and Auditor General

Department for Transport

Investigation into the Department for Transport's decision to cancel three rail electrification projects

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National Audit Office

Department for Transport

Investigation into the Department for Transport's decision to cancel three rail electrification projects

Report by the Comptroller and Auditor General

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Sir Amyas Morse KCB
Comptroller and Auditor General
National Audit Office

26 March 2018

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After the Secretary of State announced the cancellation of three electrification projects, we received correspondence about why the projects had been cancelled. The combination of the correspondence, and our interest in electrification projects following our value-for-money report on the Great Western Route Modernisation project, led us to carry out this investigation.

Investigations

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Contents

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What this investigation is about

1 In July 2017 the Secretary of State for Transport announced the cancellation of three electrification projects serving different parts of the UK: the Midland Main Line north of Kettering (to Nottingham and Sheffield); the Great Western Main Line between Cardiff and Swansea; and the Lakes Line between Oxenholme and Windermere. Electrification of the Midland Main Line to Sheffield was a 2015 Conservative party manifesto commitment. The 2015 manifesto also stated that work was underway to electrify the railway in South Wales. These three projects are part of wider electrification projects for which works are either ongoing or already complete for large sections of these lines (**Figure 1**).

2 This investigation sets out the decision-making process, leading to the July 2017 announcement. It covers:

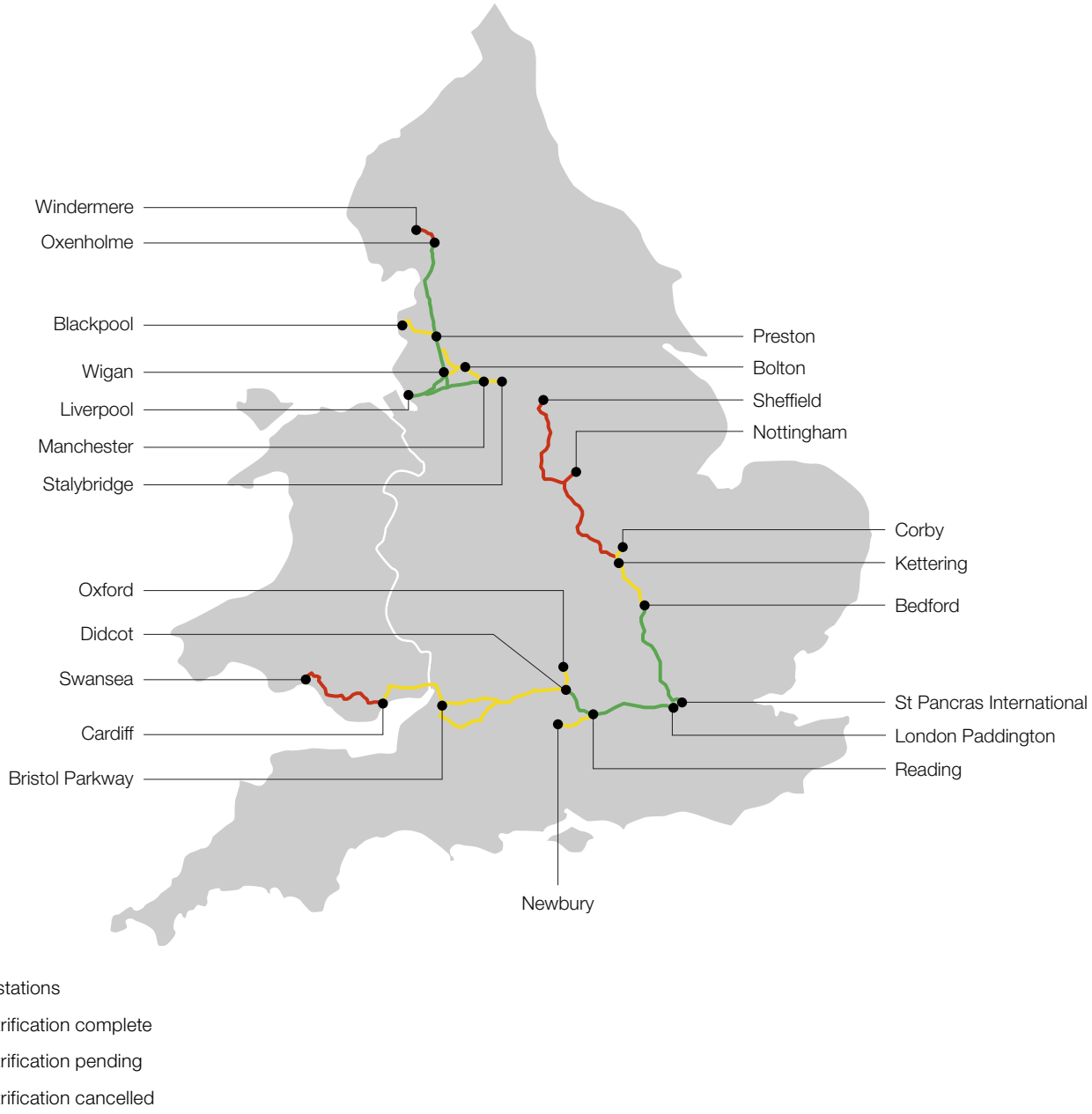
- the original case for electrification;
- why the Department for Transport (the Department) chose to cancel projects;
- how it selected which projects to cancel; and
- the Department's assessment on the impact that cancelling the projects would have on promised benefits.

3 This investigation focuses on the three electrification projects the Secretary of State announced as cancelled in July 2017. Our investigation does not seek to evaluate the value for money of the projects or the decision to cancel. It considers the savings to be achieved by cancelling the three electrification projects. It does not look at other cancelled or deferred projects in Network Rail's enhancement portfolio or at the Department's proposals for addressing the full funding gap in the 2014–2019 rail investment period.[1]

1 Enhancements are projects that improve the railway network. Major enhancements projects include Thameslink and Crossrail.

Figure 1

The three lines with cancelled electrification projects



Note

1 This map shows the electrification schemes planned as part of the Midland Main Line, Great Western Main Line and the North of England programmes. This map does not show the full extent of the Department's electrification plans.

Source: National Audit Office analysis

Summary

Key findings

The changing case for electrification

1 In 2012 the Department for Transport (the Department) identified rail electrification as a strategic priority. Network Rail had set out the case for electrification in 2009 highlighting the role that electrification could play in delivering environmental benefits, reducing operational costs, increasing capacity and reducing journey times. In 2012, the Department announced a large volume of electrification works to be delivered by Network Rail in the 2014–2019 rail investment period. Of the £34.3 billion budget for operating, maintaining, renewing and enhancing the railway in England and Wales for the period, £3 billion was for electrification schemes.[2] The Department's announcement included electrifying the line from Cardiff to Swansea and the Midland Main Line north of Kettering. The Department added Oxenholme to Windermere to its plans in 2013 (paragraphs 1.2 to 1.3, 1.5).

2 In July 2017 the Secretary of State cancelled three electrification projects because he said it was no longer necessary to electrify every line to deliver passenger benefits. He said that journeys for passengers could be improved sooner than expected by using state of the art trains. He intended to run bi-mode trains, which can transfer from diesel to electric power without passengers being aware of the switch, on the Great Western and Midland Main Lines. He intended to explore the use of alternative-fuel trains, such as those operated by battery or hydrogen, on the line between Oxenholme and Windermere (paragraphs 1.7, 4.1, 4.4, 4.6, 4.9).

2 Figures are given in 2012-13 prices.

Why the Department decided to cancel projects

3 The Department decided to cancel projects in 2017 because Network Rail's 2014–2019 investment portfolio was no longer affordable. The Office of Rail and Road and Network Rail became concerned about the deliverability of the portfolio before the start of the five-year rail investment period. Cost and schedule increases were apparent within the first year. The combination of cost increases and Network Rail's 2014 reclassification as a public body, constraining its ability to borrow funds to meet cost increases, meant that Network Rail could no longer deliver its programme within the available funding. In November 2015, Network Rail undertook a major replan of its portfolio and found that the cost of the work it intended to complete by March 2017 exceeded the available funding by £2.5 billion. In late 2016, the Department and Network Rail found that plans to raise and retain £1.8 billion through asset sales were unachievable. The Department, Network Rail and HM Treasury decided that they would need to cancel projects (paragraphs 2.1 to 2.6, 3.4).

How the Department selected which projects to cancel

4 In selecting projects for cancellation, the Department rated projects against a range of criteria. The Department considered potential savings and value for money as well as reputational impacts and the implications for passengers, the franchise and the supply chain. It prioritised projects for cancellation where it believed the majority of passenger benefits could be delivered by other means or where value for money was low. There were five projects recommended for cancellation, including the three schemes we investigated. The three schemes that we investigated were at an early stage and the Department considered they had weak cases to continue (paragraphs 3.5 to 3.6).

5 The Department estimated that cancelling the three electrification projects would save a maximum of £105 million in the 2014–2019 rail investment period. For each project, the Department estimated sunk costs, and the range of savings it expected to deliver in the current and future rail investment periods. It estimated that cancelling the three projects would avert £1,385 million of spending in the 2019–2024 rail investment period (paragraph 3.6).

6 In March 2017 Ministers agreed to some cancellations but the Prime Minister wanted to see an updated business case on the Cardiff to Swansea project. In March 2017 the Secretary of State and the Chancellor of the Exchequer agreed a package of cancellations and deferrals from the enhancements portfolio, including the Midland Main Line north of Kettering and Oxenholme to Windermere electrification projects. The Prime Minister wanted to see a planned update of the economic case for the Cardiff to Swansea scheme before deciding whether to cancel the project (paragraph 3.8).

7 In July 2017, the Prime Minister agreed to cancel the Cardiff to Swansea project and the Secretary of State announced his decision to cancel all three projects. Between March and June 2017, the Department continued to refine its calculations. It found that expected savings in the 2014–2019 rail investment period from the full package of cancellations and deferrals were £337 million. This was lower than the maximum of £562 million previously identified. The updated appraisal on the Cardiff to Swansea project had found that the benefit–cost ratio of the scheme had fallen from 0.6:1 to 0.3:1. The Department again recommended that it be cancelled. On gaining approval from the Prime Minister to cancel Cardiff to Swansea electrification, the Secretary of State announced that all three projects would be cancelled immediately (paragraphs 3.9 and 4.1, Figure 4).

Implications of the decision

8 It is too early to tell the extent to which the Department will be able to deliver the benefits of electrification without electrifying the three routes. The Department still expects to deliver the majority of promised passenger benefits through planned infrastructure works and replacing existing trains. It will still introduce new electric trains to operate services between London and Corby on the Midland Main Line. It will now use bi-mode trains to operate services on the Great Western Main Line and long-distance services on the Midland Main Line. Although bi-mode trains allow greater flexibility by being able to run on electrified and non-electrified lines, there are some disadvantages, such as increased track damage and higher energy costs, which the Department will need to take into account. For Oxenholme to Windermere the Department had interim plans to use bi-mode trains and proposes to replace existing trains with new diesel trains. It has also asked the operator to explore the use of alternative fuel trains on the route. The Department has not yet fully costed the environmental and future financial implications of its decision on Midland Main Line and Oxenholme to Windermere. It is uncertain about how much the new trains will cost, but in October 2017 the Secretary of State told the Transport Select Committee that completing electrification would "be more expensive" than buying other trains (paragraphs 1.7, 3.3, 4.1 to 4.14).

9 In the case of Midland Main Line, bi-mode trains with the required speed and acceleration did not exist when the Secretary of State made his decision. When the Secretary of State made his announcement in July 2017, he specified that the next operator for the East Midlands franchise would deliver new bi-mode trains from 2022. The Department expects journey times with bi-mode trains to be only one minute slower between London and Sheffield than they would have been with fully electric trains. However, when the Secretary of State decided to cancel the project in March 2017, the Department had advised him that bi-mode rolling stock of the required speed and acceleration to meet the timetable of the route did not currently exist. The Department told us that, although it did not include it in its written advice, it expected that manufacturers would be able to develop a bi-mode train that would deliver service improvements on Midland Main Line (paragraphs 3.8, 4.4 and 4.5).

Part One

The case for electrification

1.1 Electrification enables the use of electric rolling stock by installing overhead line equipment. It requires enabling infrastructure works including rebuilding of bridges and tunnels, clearing lineside vegetation and ground piling to hold supporting masts that carry overhead lines.

1.2 Network Rail set out the case for electrification in its 2009 Route Utilisation Strategy.[3] The strategy set out the potential passenger benefits of electrification, including reducing journey times, providing additional seating capacity on some services, and improving connectivity of hard to reach areas. It also considered that electrification could enable delivery of environmental benefits through reducing emissions, improving air quality and reducing noise, and could also reduce rail industry costs.

1.3 In 2012 the Department for Transport (the Department) identified rail electrification as a strategic priority to "efficiently meet forecast demand growth, support economic growth and better environmental outcomes, and secure cost efficiencies for both passenger and freight operators".[4] To support this priority the Department specified a large volume of electrification works for Network Rail to deliver in the 2014–2019 rail investment period. As at October 2017, 34% of Great Britain's railway routes were electrified. The amount of electrified route remained relatively stable during the 2000s but has increased in recent years as a result of Crossrail and other electrification projects. The length of electrified route increased by 43 kilometres during 2016-17.

The 2014–2019 rail investment period

1.4 Network Rail owns and operates the majority of Britain's rail infrastructure and is responsible for maintaining, renewing and enhancing this infrastructure. The Department specifies the high-level outputs that it would like Network Rail to deliver over a five-year rail investment period and the funding available to achieve them. For each investment period, Network Rail produces a plan to deliver the high-level outputs that the Department has specified.

3 Network Rail, *Network RUS Electrification*, October 2009, available at http://archive.nr.co.uk/browse%20documents/rus%20documents/route%20utilisation%20strategies/network/working%20group%204%20-%20electrification%20strategy/networkrus_electrification.pdf

4 Department for Transport, *High Level Output Specification 2012: Railways Act 2005 Statement*, July 2012, available at www.gov.uk/government/uploads/system/uploads/attachment_data/file/3641/railways-act-2005.pdf

1.5 The programme of work to be delivered in Network Rail's 2014–2019 rail investment period was widely acknowledged as ambitious. When the government announced its investment plan for the period in July 2012, the then Prime Minister described it as "the biggest modernisation of our railways since the Victorian era".[5] Network Rail expected to spend £34.3 billion (in 2012-13 prices) on operating, maintaining, renewing and enhancing the railway in England and Wales, £3 billion of which was for electrification enhancement projects. The planned electrification schemes included the Midland Main Line from Bedford to Kettering, Corby, Nottingham and Sheffield; and the Great Western Main Line from London to Swansea. In August 2013 the Department announced it would electrify the Lakes Line between Oxenholme and Windermere, subject to business case. The Department confirmed funding for the project in November 2014 (**Figure 2** on pages 11 and 12). There were other electrification schemes in the period, which we do not examine in this report.

1.6 The Department intended the three electrification schemes, along with other capacity and improvement works, to improve the passenger experience through increased capacity and reduced journey times. It also expected the schemes to reduce operating costs and provide environmental benefits through reduced carbon emissions. Figure 2 summarises the three projects.

1.7 On 20 July 2017, the Secretary of State announced that the three electrification projects would be cancelled. He explained that new bi-mode trains, along with developing technology around battery and hydrogen powered trains, meant that it was no longer necessary to electrify every line to achieve the same significant improvements to journeys. He said that with these technologies, passenger journeys on the three lines could be improved sooner than expected with state of the art trains instead of carrying out "disruptive electrification works along the whole of these routes".

5 Department for Transport press release, *Investing in rail, investing in jobs and growth*, 16 July 2012, available at www.gov.uk/government/news/investing-in-rail-investing-in-jobs-and-growth

Figure 2

Summary of the original business cases for the three electrification projects

Project	Midland Main Line north of Kettering	Cardiff to Swansea	Oxenholme to Windermere
Wider programme	Midland Main Line Upgrade	Great Western Route Modernisation	North of England programme
Programme features	Infrastructure works including capacity enhancement schemes and line speed improvement; electrification between Bedford, Kettering and Corby; and electrification between Kettering, Nottingham and Sheffield.	New Intercity Express trains; Great Western Electrification Programme (includes Maidenhead to: Cardiff, Oxford, Newbury, Bristol Temple Meads); other electrification (including Cardiff to Swansea); and other infrastructure works (stations, capability and capacity works, signalling and track widening).	Electrification of line between Oxenholme and Windermere.
When government committed to project	July 2012	July 2012	November 2014
Benefits to be delivered (whole programme)	Deliver shorter journey times into St Pancras International station; increase passenger capacity into St Pancras International station and to regional stations by adding a new train path; improve performance and passenger experience through the procurement of electric rolling stock; reduce operating costs and environmental impact through electrification of the line to Corby, Nottingham, Derby and Sheffield; and increase freight capacity.	More passenger and freight journeys, leading to economic growth; improved passenger journey experience; reduced costs for the Department for Transport; and environmental benefits.	Deliver a through train from Manchester to the Lake District, a major tourist area; and improved carbon emissions and safety.

Figure 2 *continued*
Summary of the business cases for the three electrification projects

Project	Midland Main Line north of Kettering	Cardiff to Swansea	Oxenholme to Windermere
Benefit–cost ratio at announcement	4.1:1 to 13.1:1 (very high) (full electrification of the line)	0.6:1 (poor)	2.3:1 (high)
Expected completion date at announcement	2020	2017	2017
Anticipated cost	£1.18bn, 2012-13 prices (for electrifying the whole Midland Main Line between Bedford, Nottingham and Sheffield, and between Kettering and Corby)	£1.6bn, 2012-13 prices (for electrifying the whole Great Western Main Line between Maidenhead and Swansea)	£16m, 2013-14 prices (for electrifying Oxenholme to Windermere only)

Notes

1 Electrification north of Kettering and between Cardiff and Swansea are sections of electrification announced as part of wider programmes, the Midland Main Line programme and Great Western Route Modernisation programme, respectively. Their features and benefits described above are those of the wider programmes.

2 The Department announced electrification between Oxenholme and Windermere in August 2013, subject to a business case. The Department confirmed funding for the project in November 2014.

Source: National Audit Office analysis of Department for Transport information

Part Two

Why the Department chose to cancel projects

2.1 The Office of Rail and Road, formerly known as the Office of Rail Regulation, which monitors Network Rail's progress in delivering projects, first expressed concerns about the Great Western electrification project in 2013. It, and Network Rail, continued to raise particular concerns about the costs of electrification projects in 2014. Cost estimates for the full Great Western electrification project rose from £1.6 billion in September 2014 to £2.8 billion (2012-13 prices) two years later.[6] The estimated cost of electrifying the Midland Main Line increased from £633 million in October 2013 to £1,181 million (2012-13 prices) in November 2014.

2.2 Network Rail was reclassified as a public sector body in 2014, which constrained its ability to borrow funds to cover cost overruns, as it had been able to in the past. The combination of cost increases and reclassification meant that Network Rail and the Department for Transport (the Department) considered that Network Rail was no longer able to deliver its programme within the available funding. We have previously reported on the affordability of the programme.[7]

2.3 In June 2015 the then Secretary of State said that the 2014–2019 rail investment period was costing more and taking longer than planned. He announced a major replan of the enhancements programme by the new Chairman of Network Rail, Sir Peter Hendy. The aim was to replan the work to deliver it in a more realistic timescale.

2.4 In November 2015 Sir Peter Hendy published his recommendations on how to replan Network Rail's portfolio of work.[8] He proposed delaying completion of a number of projects including electrification from Cardiff to Swansea and electrification north of Kettering until the next rail investment period, which will run from 2019 to 2024. No delivery date was specified for Oxenholme to Windermere electrification, as this project was at an early stage of development. Following this replan, Network Rail estimated that the cost of the work it intended to deliver by March 2019 exceeded the available funding by £2.5 billion. Sir Peter Hendy's report proposed addressing this shortfall by selling around £1.8 billion of Network Rail assets and increasing the amount it borrowed from the Department by £700 million. The Department for Transport subsequently accepted the report's recommendations.

6 Comptroller and Auditor General, *Modernising the Great Western Railway*, National Audit Office, November 2016, HC 781, Session 2016-17.
7 National Audit Office, *Planning and delivery of the 2014–2019 rail investment programme*, September 2015, Memorandum to the Committee of Public Accounts, available at: www.nao.org.uk/time/pac-memorandum-planning-and-delivery-of-the-2014-2019-rail-investment-programme/
8 Sir Peter Hendy, *Report from Sir Peter Hendy to the Secretary of State for Transport on the replanning of Network Rail's Investment Programme*, Network Rail, November 2015.

2.5 HM Treasury stipulated that, in order to count towards reducing the shortfall, asset sales would need to reduce public sector net borrowing (PSNB).[9] This means the structure of the asset sales would need to meet certain financial accounting and reporting requirements. Network Rail and the Department worked together during 2016 to attempt to meet these requirements. By October 2016, Network Rail estimated that while it was achieving sales, only £300 million would meet the conditions.

2.6 In October 2016, Network Rail advised the Department's Board Investment and Commercial Committee that in November 2016 its contractual commitments on projects would exceed the available funding. Network Rail urged early agreement on how to proceed if the then accounting officer was to avoid breaching his responsibilities.[10] It put forward three options to keep the 2014–2019 rail investment period spending within permitted levels:

- asking HM Treasury to remove or relax the conditions on asset sales;
- increasing the amount Network Rail could borrow from the Department; and/or
- cancelling enhancement projects.

Network Rail anticipated that it would need to cancel a substantial number of projects. It advised that cancelling projects would give rise to 'regret costs' that comprised write-offs, future losses of profit, and losses in the supply chain. At the time, it estimated that these would be between £130 million and £230 million depending on the number of projects cancelled. The Department and Network Rail jointly presented cancellation options, which we explore in Part Three.

9 Public Sector Net Borrowing is the difference between the amount of money the government spends, and the amount it receives in tax and other revenues. It is the amount the government needs to borrow to cover the difference.

10 The Board Investment and Commercial Committee approves business cases and commercial decisions for the Department's most significant projects.

Part Three

How the Department decided to cancel the projects

Selecting the projects

3.1 Network Rail had assessed all the remaining enhancement projects from the 2014–2019 rail investment period to estimate the savings they could generate if cancelled or deferred. It considered:

- the range of savings that could be achieved from cancellation or deferral;
- whether the scheme was required to meet franchise commitments;
- the likelihood of a financial impact caused by cancellation; and
- a value-for-money assessment of the project based on the benefit–cost ratio.

From these, Network Rail identified a long list of 23 projects that could feasibly be cancelled or deferred. It grouped these projects into four categories according to how cancelling them would affect passenger benefits, and whether they offered value for money.[11] Category 0 options were first choice for cancellation and included six projects. Midland Main Line north of Kettering, Cardiff to Swansea, and Oxenholme to Windermere electrification were Category 0 projects.[12] The Department for Transport (the Department) went on to cancel four Category 0 projects.

3.2 In October 2016, Network Rail, with support from the Department, presented two cancellation options to the Department's Board Investment and Commercial Committee: cancelling all 23 enhancement projects or cancelling Category 0 projects only. It warned that the first option would negatively impact passenger benefits, performance and safety, and result in significant impacts to franchises. There was also a risk of long-term damage to the supply chain.

11 Passenger benefits mean improved reliability and performance of the railway, and increased capacity.

12 The other Category 0 projects were a development project to create an electrified route for passengers and freight from the South Coast to South Yorkshire (known as the Electric Spine, later cancelled), electrification between Oxford and Bletchley (part of the new the new East West Rail Link) and work between Oxford Road and Manchester Piccadilly, which was not an electrification project.

3.3 Network Rail considered that it could replace some of the Category 0 electrification projects with cheaper alternatives that provided similar outcomes for passengers. It is not clear what the alternatives were. It also said that it was likely to achieve many of the benefits through ongoing projects elsewhere on these lines, such as capacity works and other infrastructure upgrades. Network Rail and the Department acknowledged that cancelling would sacrifice some benefits of electrification such as journey time reductions and environmental improvements. They also anticipated reductions in future franchise revenue and the possibility of significant in-life franchise changes. The Department discussed the options with its ministers.

3.4 In January 2017, the Department discussed Network Rail's Business Plan and finances with the Chancellor of the Exchequer, who asked the Department to present options to address the funding shortfall. After discussions with the Secretary of State, the Department agreed to identify £400 million of savings from Network Rail's current rail investment period budget through deferring or cancelling projects.

3.5 The Department discussed options for addressing the funding gap with the Secretary of State. In considering projects for cancellation, it prioritised projects where it believed the majority of passenger benefits could be delivered by other means or where value for money was low. It advised on a shortlist of five projects, including the three we investigated, that the Secretary of State had indicated that he was considering cancelling or deferring from the options presented by Network Rail. The Department provided information on potential savings and value for money for each of the shortlisted projects. It also assessed the likely reputational impacts and implications for passengers, the franchise and the supply chain (**Figure 3**).

3.6 The Department estimated that the likely maximum savings from cancelling the three projects in the current rail investment period would be £105 million, net of sunk costs. All three projects were at an early stage and so the sunk costs were low in comparison to the expected cost of the programme. It also estimated that by cancelling the three projects, it could avoid £1,385 billion of spending in the 2019–2024 rail investment period (**Figure 4** on page 18). In total, the Department had identified up to £221 million savings from cancelling projects and up to £156 million from deferring projects in the current rail investment period.[13] We do not explore the other projects in this report.

13 The other projects recommended for cancellation were the Electric Spine (see footnote 12) and a fund for rolling out new signalling technology (both were cancelled). Those recommended for deferral were the Transpennine route upgrade, part of the East Coast connectivity fund (a scheme to improve capacity and journey times on the East Coast Main Line) and Oxford corridor capacity (a scheme to provide platform capacity and line speed improvements in the Oxford area).

Figure 3

Reasons why the three projects were recommended for cancellation in January 2017

Project	The Department's value-for-money assessment (benefit–cost ratio)	Franchise and rolling stock implications[1]
Midland Main Line north of Kettering	The benefit–cost ratio of electrifying this part of the route was 0.8:1, which the Department for Transport (the Department) considers poor value for money. The assessment factored in the impact of High Speed 2 (HS2), which assumes that passengers will travel from London to Sheffield via HS2 and not the Midland Main Line from 2033, when HS2 is complete. The Department noted that the benefit–cost ratio could offer medium or high value for money under alternative fuel price and air quality assumptions. The Department did not reassess the benefit–cost ratio to include both HS2 and alternative fuel and air quality assumptions.	There were no franchise or rolling stock implications, as the Department had not yet specified the rolling stock that would be required for the next franchise, which at the time of the recommendation was due to start in March 2018. In March 2017 it was rescheduled to start in June 2019. The Department acknowledged that the benefits of cancelling would depend on the rolling stock choice for the next franchise.
Cardiff to Swansea	In 2015, the benefit–cost ratio was 0.6:1, which the Department considered poor value for money. In January 2017, the Department estimated that the benefit–cost ratio had weakened further due to cost escalation on the project and the decision to buy bi-mode trains for the full length of the Great Western Main Line. Buying bi-modes meant that electrification was no longer needed, as the trains can run on non-electrified track. The estimated costs of electrifying this section rose from £295 million in March 2014 to £433 million in August 2016 (2012-13 prices).	There were no franchise or rolling stock implications. This is because the Department had already amended the contract for the fleet of new Intercity Express Programme trains so that all trains would be capable of running on diesel or electric power. It took this decision in response to delays to the Great Western Electrification Programme.[2]
Oxenholme to Windermere	In January 2017, the Department assessed the benefit–cost ratio of the project as 0.9:1, representing poor value for money. Costs to electrify had risen from £16 million in 2014 to £35 million in March 2017 (cash prices).	Electrifying the route was part of the Department's franchise commitment for the line. The Department recognised that there could be financial implications from cancelling the project as it would need to subsidise the operator to cover any additional costs. The Department acknowledged that there could be costs associated with providing alternative rolling stock to ensure that through trains from Manchester Airport to the Lake District could continue to run.

Notes

1 In the franchise agreement, the Department specifies the type or characteristics of the rolling stock it would like the train operator to use.

2 Comptroller and Auditor General, *Modernising the Great Western railway*, Session 2016-17, HC 781, National Audit Office, November 2016, paragraphs 4.1-4.2.

Source: National Audit Office analysis of Department for Transport information

Figure 4

The Department for Transport's assessment of the three projects at cancellation

Project	Midland Main Line north of Kettering	Cardiff to Swansea	Oxenholme to Windermere
Sunk cost (£m, cash prices)	12[1]	14	1
2014–2019 rail investment period saving (£m, cash prices)	55	15	35
2019–2024 rail investment period saving (£m, cash prices)	900	485	0
Benefit–cost ratio	0.8:1	0.3:1	0.6:1
Department's value-for-money assessment	Poor	Poor	Poor

Note

1 Network Rail spent a further £10 million on the Midland Main Line programme prior to March 2014. The Department and Network Rail have not assessed how much of this spending relates to the cancelled electrification works.

Source: Department for Transport

Cancelling the projects

3.7 In February 2017, the Secretary of State wrote to the Chancellor of the Exchequer outlining a proposal for generating the required £1.8 billion of savings:

- £400 million reduction in Network Rail spending during the current rail investment period (including £105 million from the three electrification cancellations, and the remainder from other cancellations, deferrals and savings from Network Rail's enhancement portfolio);
- £800 million of asset sale income to be generated by 2019-20;
- £300 million of Network Rail efficiencies; and
- £300 million from the Department.

3.8 The Department needed agreement from the Prime Minister and HM Treasury to cancel the Midland Main Line and Cardiff to Swansea sections. In March 2017 ministers agreed to cancel the Midland Main Line north of Kettering and Oxenholme to Windermere electrification projects but did not announce their decision until July. The Prime Minister asked the Department to complete an updated assessment on the likely savings and benefits of the Cardiff to Swansea project before she decided whether to cancel it or not.

3.9 The Department continued to re-examine and verify the savings from all projects between March and June 2017. It found that the estimated savings from the full package of cancellations and deferrals would be lower than expected, £337 million compared to the March high-end estimate of £562 million. It recommended additional cancellations and deferrals, including Cardiff to Swansea, in order to generate further savings. The updated economic appraisal of the Cardiff to Swansea project, performed in April 2017, concluded it was poor value for money, with a benefit–cost ratio of 0.3:1. In July 2017, the Secretary of State put forward a revised proposal to the Prime Minister who agreed to cancel the project.

Part Four

Delivering benefits without electrification

4.1 On 20 July 2017, the Secretary of State announced that the three electrification projects we investigated would be cancelled. He said that new bi-mode train technology along with developing technologies to power trains with alternative fuels meant it was no longer necessary to electrify every line to achieve the same significant improvements to journeys.

4.2 Our 2016 report *Modernising the Great Western Railway* reported that bi-mode trains allow greater flexibility since they are able to run on electrified and non-electrified lines.[14] We also highlighted some of their disadvantages. These include increased track damage and higher energy costs compared to electric trains. Electric trains are faster (in the right conditions) than comparable diesel or bi-mode trains, allowing reduced journey times. Decisions and specifications for trains are part of the Department for Transport's (the Department's) franchise agreement with the train operating company for each route.

4.3 This part sets out the implications for the routes of not electrifying. It is too early to tell whether the benefits of electrification to passengers, the environment and the taxpayer, via lower costs to the Department, will be fully achieved.

Delivering passenger benefits

Midland Main Line north of Kettering

4.4 The main passenger benefits of electrifying the Midland Main Line were increased capacity, reduced journey times and better trains. The Department estimated that the full electrification programme would allow trains with 3,500 seats to arrive in St Pancras station during the morning peak-hour, which is a significant increase in capacity above the 1,800 seats at the moment. It considers that its ongoing programme to upgrade the Midland Main Line, which includes infrastructure works and new electric trains to operate services between London and Corby, will still allow trains with 2,900 seats to arrive in the peak hour. It also intends to introduce bi-mode trains on long distance routes. The Department estimates that train journeys will only be one minute slower using diesel powered trains rather than electric trains between Sheffield and London without electrifying beyond Kettering. It assumes that bi-mode trains will be comparable.

14 Comptroller and Auditor General, *Modernising the Great Western railway,* National Audit Office, November 2016, HC 781, Session 2016-17.

4.5 Delivering the time saving is dependent on the speed at which trains can run along the route and the service pattern. At the time of the decision to cancel in March 2017, officials had advised the Secretary of State that the bi-mode rolling stock with the required speed and acceleration did not exist. They said that the maximum speed of bi-mode trains being built at the time was 100 miles per hour in diesel mode and that the acceleration was not sufficient to meet the timetable of the route. There was also a very high degree of uncertainty over the price of new bi-mode trains. The Department told us that, although it did not include it in its written advice, it expected that manufacturers would be able to develop a bi-mode train that would deliver the required service improvements on the Midland Main Line. In his announcement in July 2017, the Secretary of State said that the next operator for the East Midlands franchise would be required to deliver a new fleet of bi-mode intercity trains on the line from 2022. However, the Department was still uncertain whether existing bi-modes could be modified to achieve the required speed and acceleration.

Cardiff to Swansea

4.6 The main passenger benefits of electrifying the Great Western route were to increase passenger capacity and to improve passenger experience. The Department had already ordered new bi-mode trains to run on the route before the decision to cancel. The train specification includes 24% more seats than the trains they replace. The Department expects to achieve the majority of journey time benefits through running the bi-mode trains in electric mode between London and Cardiff, where the trains can run at 125 miles per hour where line speed allows. The maximum speed a train (diesel or electric) can run between Cardiff and Swansea is 90 miles per hour so the full benefits of running fast electric trains would not have been possible even with electrification. Hitachi, the train manufacturer, estimates that electrification will reduce journey times between London and Swansea by 15 minutes once electrification to Cardiff is completed in 2019. The Department's appraisal of the project in April 2017 assumed that journey times between Cardiff and Swansea will be 3.5 minutes longer with bi-mode trains operating in diesel rather than electric mode. However, at the Department's request, the manufacturer has agreed to modify the bi-mode trains to enable them to operate at faster speeds in diesel mode. The Department currently expects that once electrification to Cardiff has been completed, the trains will be able to achieve the same journey times in diesel mode between Cardiff and Swansea as they would have in electric mode.

Oxenholme to Windermere

4.7 The main passenger benefits of electrifying Oxenholme to Windermere were to provide a through train to the Lake District from Manchester Airport and to reduce journey times. When he cancelled the project, the Secretary of State said that from May 2018 there would be double the number of direct services from Manchester Airport and that there would be brand new trains with more seats, better on-board facilities including air-conditioning, toilets, free Wi-Fi and plug sockets, subject to business case.

4.8 The current Northern franchise, which includes this route, started in April 2016 and the franchise infrastructure assumptions said the line would be electrified by the end of 2017. At the time the Department awarded the franchise, it recognised that Network Rail would not deliver electrification in time to meet the franchise commitment. It is not clear why this was the case. To ensure that direct services from Manchester Airport to the Lake District could continue to run, the franchise operator proposed to fit some of its electric trains with diesel engines. The train operator planned to introduce these from May 2018, although they are now likely to be introduced later this year.

4.9 These bi-mode trains would not, however, provide the passenger benefits promised in the franchise or the Secretary of State's announcement in July 2017. In January 2018, the Department advised that the operator should be permitted to buy new or cascaded diesel trains for the route in order to meet standards set out in the franchise around quality of rolling stock. In the longer term, the Secretary of State has asked the train operator to explore the possibility of using alternative fuel trains such as hydrogen or battery trains, on the route by 2021.

Reducing the Department's costs and the impact on the environment

4.10 In the original plan to electrify routes, the Department also aimed to reduce operating costs and carbon emissions by using electric trains. Electric trains have lower purchase, maintenance and fuel costs than diesel trains. They are also quieter and emit less carbon. In October 2017, the Secretary of State told the Transport Select Committee that completing electrification would be more expensive than the approach he had taken.

4.11 In February 2017, the Department had assessed three rolling stock options for the East Midlands franchise which operates the Midland Main Line:

- electric trains, which required the entire line to be electrified;
- new bi-mode trains which could run along electrified and non-electrified track; and
- continuing with the existing diesel fleet or a fleet from another line.

Bi-mode trains offered high value for money but had a poorer investment case than the other two options. They would also result in higher operational and capital expenditure for the Department. The Department anticipated £230 million additional pressure to its budget over a 10-year period compared to the full electric train option. This was less than the £955 million expected cost of electrifying north of Kettering. Once the Department had made the decision not to electrify the line north of Kettering in March 2017, electric trains were no longer an option.

4.12 The appraisal also showed that the monetised value of environmental benefits and, in particular, greenhouse gas emissions would be significantly lower with bi-modes than electric trains. It estimated that electric trains would lead to an additional £260 million of benefits from reduced greenhouse gas emissions.

4.13 The Department expects to save £35 million in the 2014–2019 rail investment period from cancelling the Oxenholme to Windermere project, based on the most recent cost estimate. These savings do not take account of any additional costs associated with making changes to the franchise as a result of the delay to electrification or the subsequent cancellation. These costs are subject to negotiation. In January 2018, the Department estimated the additional leasing cost of three new diesel trains at approximately £2.5 million a year from April 2020, which represents approximately £10 million over the life of the franchise. It also anticipates additional operating costs compared to the cost of operating the electric rolling stock specified in the franchise.

4.14 The Department expected the project to reduce journey times and to improve carbon emissions and safety by encouraging road users to make journeys by rail instead. The Department continues to investigate options for alternative fuel trains along the route. The technology is in an early stage of development and costs are uncertain but the Department expects them to be significantly higher than conventional trains.

Appendix One

Our investigative approach

Scope

1 We investigated the Department for Transport's (the Department's) July 2017 decision to cancel three rail electrification projects:

- the Midland Main Line north of Kettering;
- the Great Western Main Line between Cardiff and Swansea; and
- the Lakes Line between Oxenholme and Windermere.

We conducted this investigation after receiving correspondence that raised concerns about the impact of the decision.

2 We investigated:

- the original case for electrification;
- why the Department for Transport (the Department) chose to cancel projects;
- how it selected which projects to cancel; and
- the Department's assessment on the impact that cancelling the projects would have on promised benefits.

Methods

3 In examining these issues, we drew on a variety of evidence sources.

4 We interviewed key individuals from the Department about the decision-making process.

5 We reviewed documents received from the Department and Network Rail, correspondence between ministers and departmental officials, and information in the public domain.

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