A Short Guide to
Network Rail

July 2015

National Audit Office

About this guide
Contact details

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.

This guide provides an overview of Network Rail, the environment it operates in and what to look out for across three main business activities: Network Operations, Infrastructure Projects and long-term planning. It is primarily intended for the Transport Select Committee and has been prepared in light of Network Rail's reclassification as a public sector organisation.

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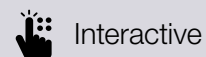✉ matt.kay@nao.gsi.gov.uk
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20,000
miles of track
Network Rail is part of complex system to deliver rail services to passengers and businesses. It owns and operates the majority of Britain's rail infrastructure including 20,000 miles of track

1 September 2014
Network Rail was classified as a public sector body, and is therefore now subject to direct parliamentary scrutiny and accountability

1 Sept 2014

Two-thirds of its £38 billion
is planned to be invested by Network Rail on agreed expenditure for the five years to March 2019 on renewing and upgrading the railway

£54.1 billion
Network Rail will be included in the Whole of Government Accounts from 2014-15, including the railway network asset, valued in Network Rail's accounts at £54.1 billion, and £38.5 billion debt liabilities

68%
overall cost of running rail services was contributed by passengers in 2013-14

100%
Passenger numbers are forecast to grow by 100% to 2041, and freight by 90% over a similar period

£19.6 billion
Network Rail receives the majority of its funding for its operations from government: £19.6 billion for the five years to March 2019

Over 35,500
staff employed by Network Rail at March 2015, of which nearly three-quarters worked on operating and maintaining the railway

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Network Rail owns and operates the majority of Britain's rail infrastructure.[1] This infrastructure comprises 20,000 miles of track, 32,000 bridges and tunnels, 2,500 stations (most of which are leased to train operators) and 8,200 commercial properties. Network Rail maintains, renews, replaces and enhances the rail infrastructure. It manages the day-to-day use of the infrastructure but does not run services or own passenger trains. Network Rail plans its activity in five-year periods, called Control Periods, which are agreed with its regulator, the Office of Rail and Road (formerly known as the Office of Rail Regulation).

Network Rail's organisational structure

Network Rail
CEO: Mark Carne

Group finance → Overview

Safety, Technical and Engineering → Overview

Network Operations (Maintenance and operations) → Day-to-day activity devolved to eight routes, led by a managing director, which is intended to give greater accountability to users and achieve financial efficiencies → Network Operations → Accounts for 73% of Network Rail's workforce, less than one-third of spend

Infrastructure projects (Renewals and enhancements) → Renewals and enhancement contracted by route teams, as agreed through the strategic planning process. → Infrastructure Projects → Accounts for 12% of Network Rail's workforce, two-thirds of spend

Group strategy

Digital railway → Network Rail plans its activity in five-year periods, called Control Periods. The Office of Rail and Road determines whether planned activity and spend is efficient. → Long-term planning for the future → Not a significant area for workforce or spend

Group corporate communications

Source: National Audit Office analysis of Network Rail's 2015 organogram

Note

1   Exceptions include High Speed 1, part of the Heathrow Express route, lines run by Transport for London and Passenger Transport Executives.

Reclassification of Network Rail

Network Rail was reclassified as a public sector organisation from 1 September 2014

From its formation in 2002 until 2014, Network Rail was classified as a private company in the UK National Accounts statistics. Following a change in its statistical approach, to include the level of risk exposure when deciding whether an entity is under government control, the Office for National Statistics reclassified the company. This is not supposed to change the railway industry, Network Rail's structure or to affect the day-to-day operations of the rail network. Reclassification directly subjects Network Rail to the traditional instruments of Parliamentary accountability.

The changed governance and financial arrangements are documented in a published Framework Agreement between the Department for Transport and Network Rail.

- Mark Carne, the chief executive, is designated as an accounting officer.

- Network Rail has to comply with central government accountability and control frameworks such as HM Treasury's Managing Public Money.

- Network Rail's directors are still responsible for appointing the auditors of its accounts, under the requirements of the Companies Act, but government expects the directors to offer this appointment to the Comptroller and Auditor General (the head of the NAO) unless there are special circumstances not to do so. Network Rail will confirm the appointment of its auditors at its annual general meeting in July 2015.

Network Rail's performance and position will be included in the Whole of Government Accounts from 2014-15 and the Department for Transport's accounts from 2015-16, including the railway network asset, valued in Network Rail's 2014-15 accounts at £54.1 billion, and £38.5 billion debt liabilities.

Network Rail is now under ultimate government control, which has already resulted in changes to its financing arrangements, for example. The main changes address some of the concerns raised by the Committee of Public Accounts in its 2011 report: Office of Rail Regulation: Regulating Network Rail's Efficiency.

Company governance

Network Rail was established by the Department for Transport in 2002 to take responsibility for the national rail network after Railtrack, the previous private sector owner, entered administration in 2001. Network Rail is a company limited by guarantee. It does not pay dividends. Until June 2015, members, rather than shareholders, oversaw the performance of the company. Members were recruited from the public; the Secretary of State for Transport was also a member.

On 25 June 2015, the government announced significant changes at Network Rail because in some areas performance had fallen below the standards expected and to reflect the amended accountability arrangements following reclassification. The changes include delaying a number of planned improvements to upgrade the network because the programme as a whole was no longer affordable. We describe these changes within Part 2, Infrastructure Projects.

The key governance changes made were:

- ending the role of the public members;

- replacing Network Rail's Chairman Mr Richard Parry-Jones with Sir Peter Hendy (the current commissioner of Transport for London); and

- appointing Richard Brown as a Special Director of Network Rail. Richard Brown is also a non-executive director of the Department for Transport, and will report on Network Rail's progress to the Secretary of State.

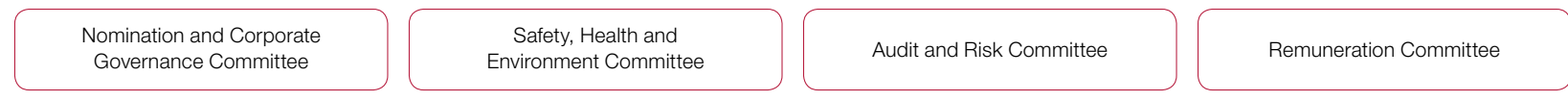Source: National Audit Office analysis of Network Rail Board information and financial statements
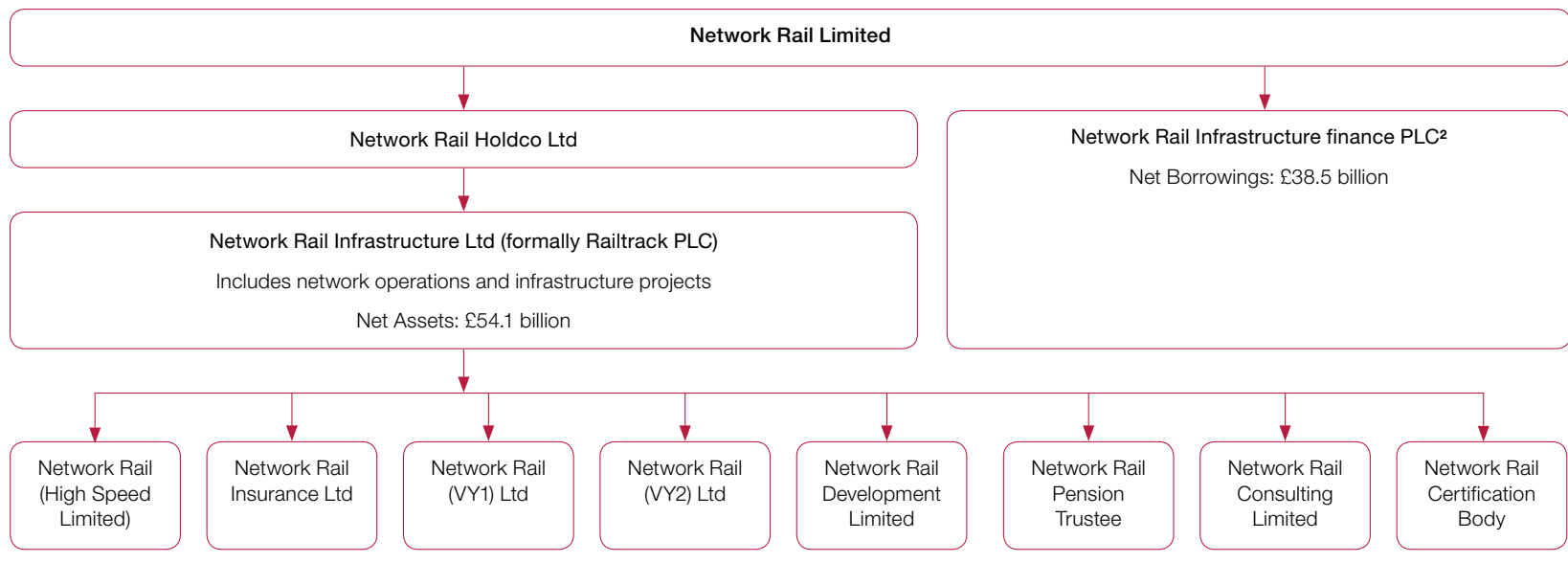
Company governance

Network Rail Limited has been established with subsidiaries for separate functions. Its most significant components are Network Rail Infrastructure Limited, where this guide focuses, and Network Rail Infrastructure Finance PLC. Together, these include the network asset (£54.1 billion) and borrowings (£38.5 billion), and account for at least 99% by value of the whole group based on gross turnover, expenditure, assets and liabilities.

Governance

Board (three executive members and seven non-executive directors)[1]

| Nomination and Corporate Governance Committee | Safety, Health and Environment Committee | Audit and Risk Committee | Remuneration Committee |

Company

Network Rail Limited

Network Rail Holdco Ltd

Network Rail Infrastructure finance PLC[2]

Net Borrowings: £38.5 billion

Network Rail Infrastructure Ltd (formally Railtrack PLC)

Includes network operations and infrastructure projects

Net Assets: £54.1 billion

| Network Rail (High Speed Limited) | Network Rail Insurance Ltd | Network Rail (VY1) Ltd | Network Rail (VY2) Ltd | Network Rail Development Limited | Network Rail Pension Trustee | Network Rail Consulting Limited | Network Rail Certification Body |

Notes

1 Excludes the special director appointed on 25 June 2015.

2 Network Rail Infrastructure Finance PLC sits outside of the Network Rail Ltd. It is a subsidiary, with its shares held by HSBC (CJ) Ltd.

Source: National Audit Office analysis of Network Rail Board information and financial statements

Network Rail is part of a complex system to plan, operate and regulate rail services to meet the needs of passengers and freight users.

HM Treasury

Secretary of State

Funding for grant, subsidy and loan, and receipt of premium payments

Department for Transport

Network Grant & Debt Facility

Provides Statement of Funds and High Level Output Specification before each control period

Statutory guidance

Affordability statement

Office of Rail and Road (formerly the Office of Rail Regulation)

Final Determination and Network Operators Licence, monitoring and reporting of performance

Requirements for Scottish route

Transport Scotland

Operating Licences

Represent views

Network Rail

Network Rail Executive

Network Rail Board

Passenger transport executives and local transport bodies

Welsh government

Can contract for enhancements

Special member

Other income eg for property rental

Third parties

Transport Focus

Freight customers

Freight charges

Passengers

Fare and other revenue

Freight operating company

Compensation payments

Access charges

Rolling stock leasing companies or other providers

Train lease payments

Train operating company

Compensation payments

Franchise agreements

Payments for renewals & enhancements

Competitive tendering process

External contractors

Contractor-level arrangements

Franchise subsidy payments to train operating companies, and premium payments from them

Subcontractors

Influence   Control   Payment
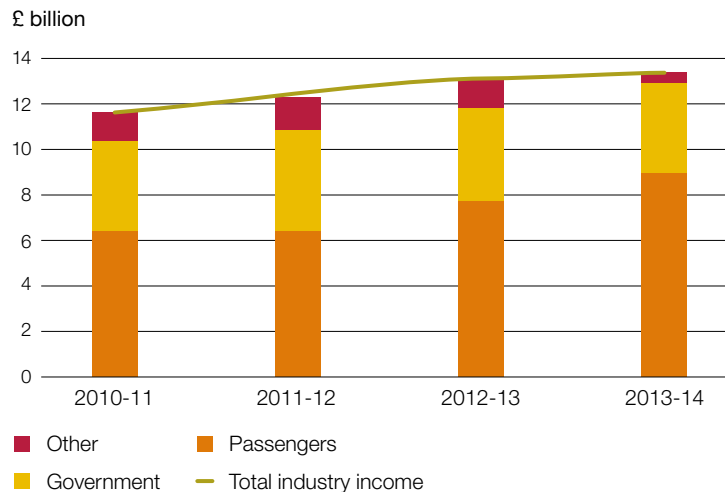
Source: National Audit Office analysis

Rail industry income and costs

The rail industry has three main sources of funding:

- Passengers (through rail fares and station car park payments).

- Government bodies (including central, devolved and local transport bodies).

- Other sources such as property rental income, station lease payments, and freight user charges.

Income from passengers has increased significantly over the past four years, reflecting government policy that rail users should bear more of the costs of the railway.
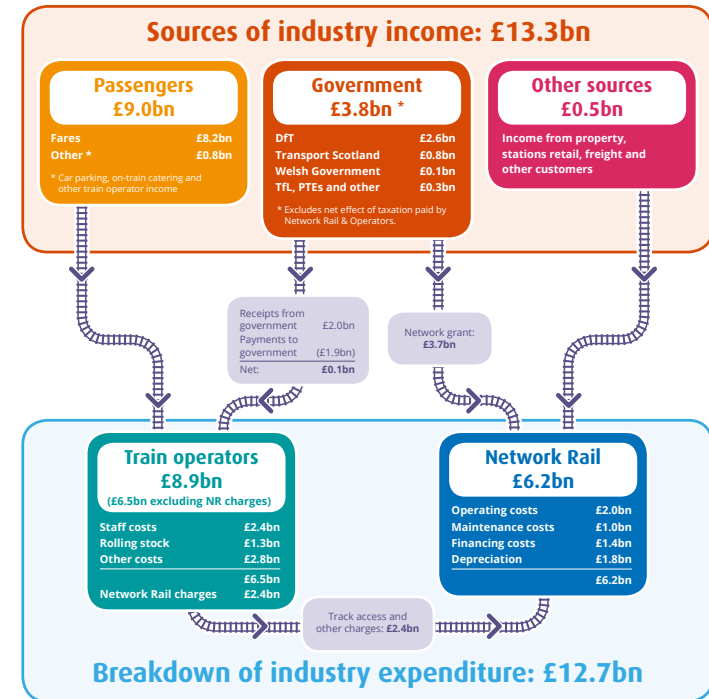
Rail industry income, 2010–2014

£ billion

Source: National Audit Office analysis of the Office of Rail and Road data

Analysis of rail industry income and expenditure, 2013-14

Who pays for Britain's Railways?

GB Rail Industry Financials Information Report 2013-14

ORR
OFFICE OF RAIL REGULATION

Sources of industry income: £13.3bn

Passengers £9.0bn		Government £3.8bn *		Other sources £0.5bn
Fares	£8.2bn	DfT	£2.6bn	Income from property, stations retail, freight and other customers
Other *	£0.8bn	Transport Scotland	£0.8bn	
		Welsh Government	£0.1bn	
		TfL, PTEs and other	£0.3bn	
* Car parking, on-train catering and other train operator income		* Excludes net effect of taxation paid by Network Rail & Operators.		

Receipts from government £2.0bn
Payments to government (£1.9bn)
Net: £0.1bn

Network grant: £3.7bn

Train operators £8.9bn (£6.5bn excluding NR charges)		Network Rail £6.2bn	
Staff costs	£2.4bn	Operating costs	£2.0bn
Rolling stock	£1.3bn	Maintenance costs	£1.0bn
Other costs	£2.8bn	Financing costs	£1.4bn
	£6.5bn	Depreciation	£1.8bn
Network Rail charges	£2.4bn		£6.2bn

Track access and other charges: £2.4bn

Breakdown of industry expenditure: £12.7bn

Note

1   Numbers are based on Network Rail's regulatory accounts and do not sum due to timing differences in the receipt of income and expenditure.

Source: Office of Rail and Road analysis

Network Rail's financial performance in 2014-15

In 2014-15, Network Rail Limited received revenue of £6.1 billion, of which grant income from the Department for Transport was £3.7 billion.

It incurred £5.7 billion of costs including:

- staff costs of £1.2 billion, and

- payments of £1.5 billion to external providers for operating and maintaining the network, and supporting the company.

Profit for the year was £0.5 billion, after accounting for favourable movements on property revaluations and other gains and losses totalling £0.1 billion, but before tax.

Network Rail recorded a loss after tax of £0.4 billion because it has decided, following reclassification, to no longer recognise deferred tax assets, incurring an extraordinary charge of £0.8 billion.
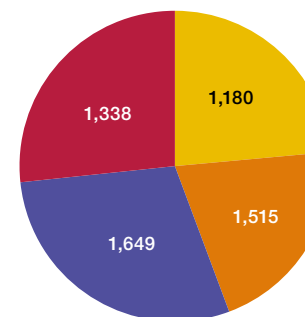
Revenue, £6,087 million

- ■ Franchised track access and grant income
- ■ Freight revenue
- ■ Property rental income
- ■ Other income

256
75
27
5,729
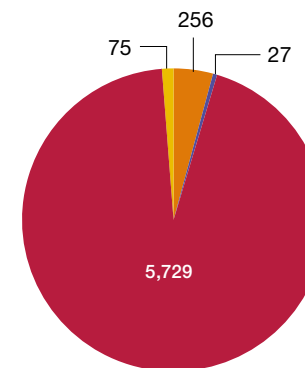
Gross costs, £5,682 million

- ■ Finance costs
- ■ Employee costs (net of capitalisation)
- ■ External Operating costs (including maintenance)
- ■ Depreciation (less amortisation of third-party assets)

1,338
1,180
1,515
1,649

Source: National Audit Office analysis of Network Rail's preliminary results for 2014-15

Network Rail's financial position in 2014-15

At 31 March 2015:

- The group's £54.1 billion Property, Plant and Equipment asset, representing the railway network, accounted for 93% of total assets. Investment of £6.5 billion in the network was added to the asset value, which is charged over the life of the asset in the form of depreciation.

- The second largest item on the balance sheet was Network Rail's borrowings (£38.5 billion), the vast majority of which are bonds issued to the market, supported by a government guarantee. These borrowings will be gradually replaced by a loan from the Department for Transport at a fixed rate of interest.
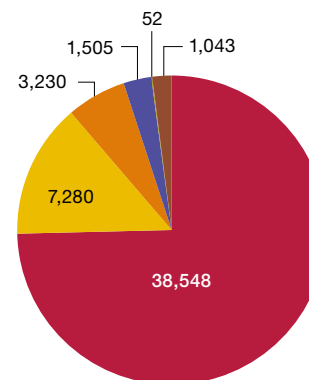
Assets, £58,049 million

- Railway network asset (PPE)
- Investment property
- Derivatives
- Cash
- Other

313
771
982
1,892
54,091
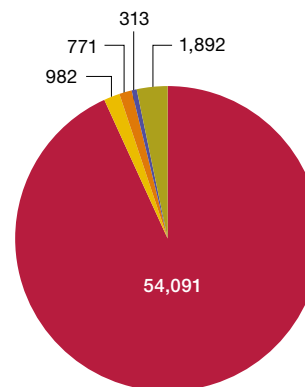
Liabilities, £51,658 million

- Borrowings
- Trade and other payables
- Deferred tax
- Pension scheme
- Other
- Derivatives

52
1,505
3,230
1,043
7,280
38,548

Source: National Audit Office analysis of Network Rail's preliminary results for 2014-15

Key statistics – Passenger and Freight Growth

In the last decade passenger numbers have gone up by 50%. Network Rail forecasts that rail passenger and freight demand will continue to grow strongly. Over the next 30 years it expects passengers to grow by over 100% and freight by 90% from 2011 numbers.

Network Rail has a **Long-term Planning Process** to prioritise the work it needs to carry out on the rail network to meet expected demand, explained in Long-term planning for the future.

Actual and forecast growth in passenger demand
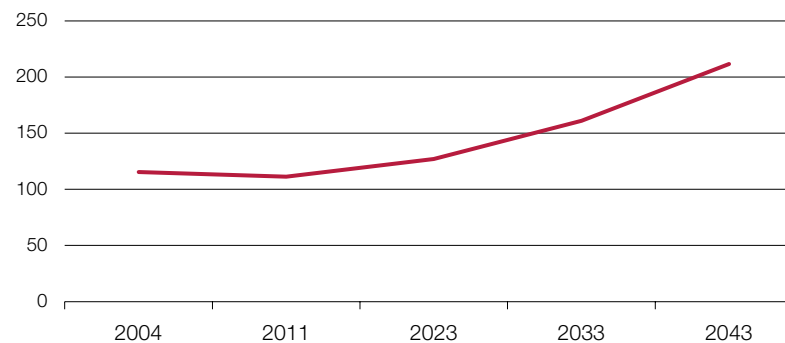
Passenger Journeys (million)
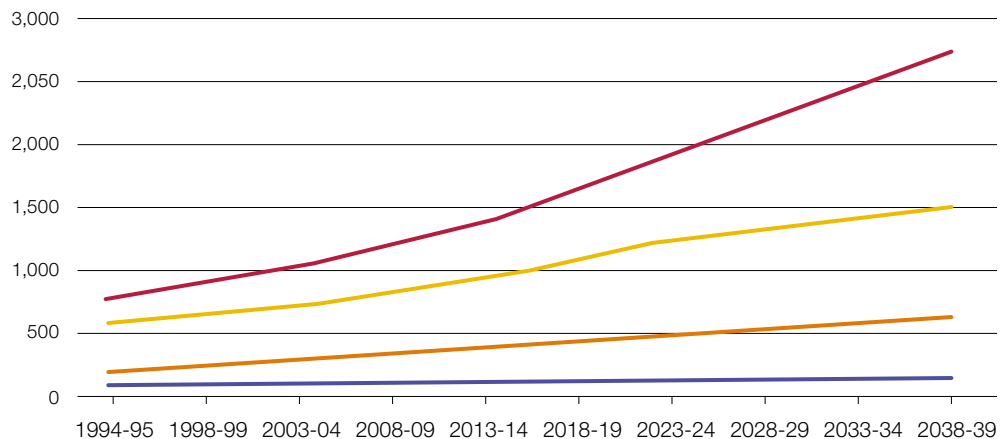
— Total   — London and the South East   — Regional   — Long Distance

Source: National Audit Office analysis of Office of Rail and Road and Network Rail data

Actual and forecast growth in freight demand

Tonnes Lifted (millions)

Source: National Audit Office analysis of Network Rail data

Network Rail's funding for Control Period 5

Network Rail's operating expenses are funded by government grant, charges paid by train operators and income from other sources such as property. It funds its renewals and enhancement work through borrowing.

The Office of Rail and Road expects Network Rail to require gross revenue of £31.8 billion over Control Period 5 to meet £13.4 billion operating and industry costs, £11.9 billion asset depreciation, £6.3 billion financing and £0.2 billion other costs.

The revenue requirement for England and Wales is £28.6 billion and £3.2 billion for Scotland.

It used to borrow from the financial markets supported by a government guarantee. Following reclassification, the Department for Transport has agreed a loan facility for Network Rail to borrow directly from government for Control Period 5 with an original value of £30.3 billion. It can be amended by agreement of both sides. At 31 March 2015, the Department had issued £6.5 billion to Network Rail.

At the end of Control Period 4 total borrowings were valued at £33.4 billion, £11.3 billion of the loan facility will be required to renew existing debt during the control period.

The largest source of funding for Network Rail's operations is in the form of a Network Grant, from the government. It also receives funding from:

● fixed and variable access charges which are paid by train operators to use Network Rail's track and stations; and

● revenue generating activity such as leasing property.

In the 2015 Summer Budget, the government announced that it will change the way it funds the rail industry, channelling more directly through operators.

Funding sources for Network Rail's £31.8 billion

Revenue requirement for Control Period 5 (£bn)

- Network Grant
- Fixed Charges (train operators)
- Variable Charges (train operators)
- Other Income (including property)
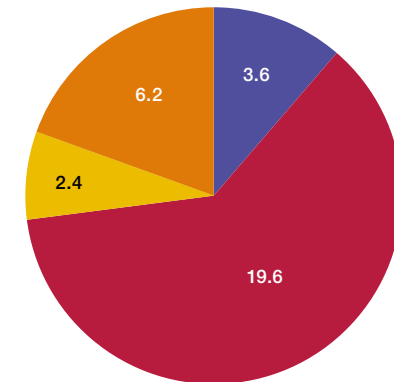
Note
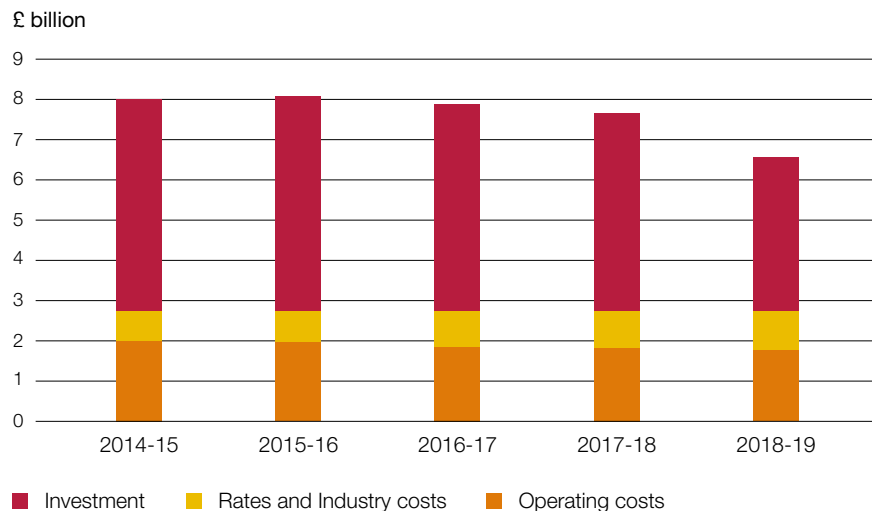1   Figures are given in 2012-13 prices.

Source: National Audit Office analysis of Office of Rail and Road's Periodic Review, October 2013

Where Network Rail will spend its money in Control Period 5

Network Rail plans to spend:

- Nearly two-thirds of its £38 billion Control Period 5 settlement on investments to renew and enhance the network (excluding the financing costs for the borrowing used to fund this work).

- A quarter of spend will be on operating and maintaining the network, and support costs to run the company.

- The remaining spend is on industry costs and rates. It includes electricity costs, which Network Rail largely recovers from operators.

Control Period 5: planned spend

£ billion

Investment | Rates and Industry costs | Operating costs

Note

1   Figures are given in 2012-13 prices.

Source: National Audit Office analysis of Table 14.1 Office of Rail and Road's Periodic Review, October 2013

Control Period 5: planned spend by area
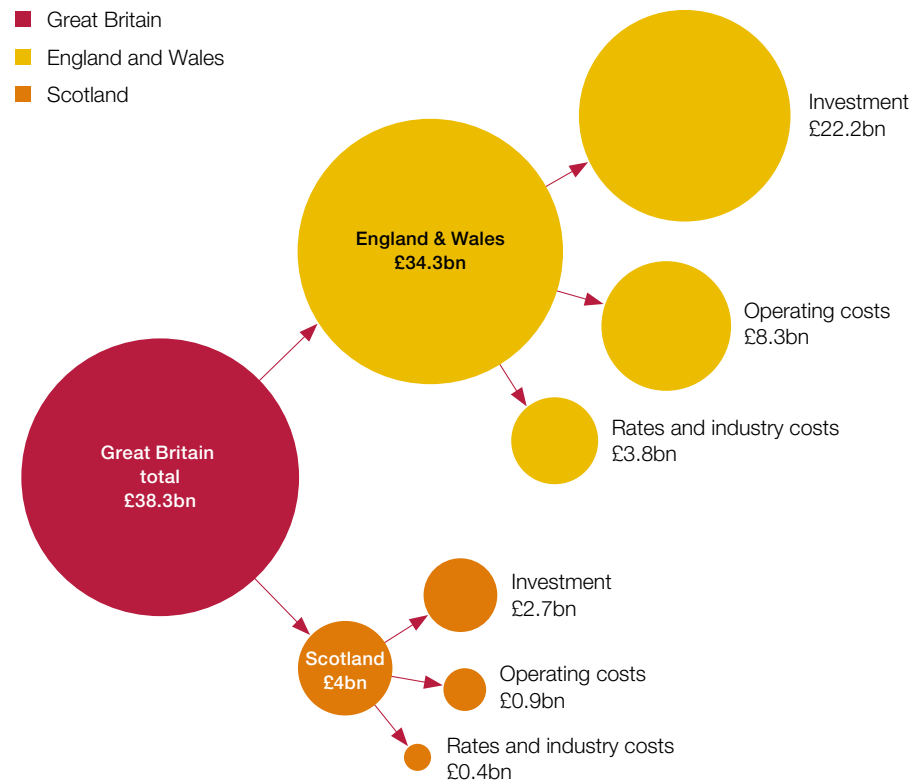
- Great Britain
- England and Wales
- Scotland

Great Britain total £38.3bn

England & Wales £34.3bn
- Investment £22.2bn
- Operating costs £8.3bn
- Rates and industry costs £3.8bn

Scotland £4bn
- Investment £2.7bn
- Operating costs £0.9bn
- Rates and industry costs £0.4bn

1/2

Network Rail's efficiency targets for Control Period 5

Where activities recur (operations, maintenance and renewals), ORR requires Network Rail to carry out work more efficiently than previously while keeping the network in a stable, safe condition. Efficiency is about achieving the same outcome at lower cost, rather than reducing costs by reducing what is done.

Efficiency target

Planned expenditure (after including efficiency targets)

24.9%

£2,119m
Support

Expenditure on activities that support Network Rail's business such as HR and finance (mainly administrative costs).

20.0%

£1,968m
Operations

Expenditure on activities that support Network Rail's business such as HR and finance (mainly administrative costs).

19.4%

Weighted Average Efficiency across the four areas of spend

17.4%

£5,166m
Maintenance

Covers the work required to maintain assets efficiently and sustainably. It may either be planned (for example, routine work or visual inspections) or reactive (for example, when responding to asset failures).

16.4%

£12,107m
Renewals

Covers work to replace assets which are nearing the end of their useful lives with the modern equivalent asset.
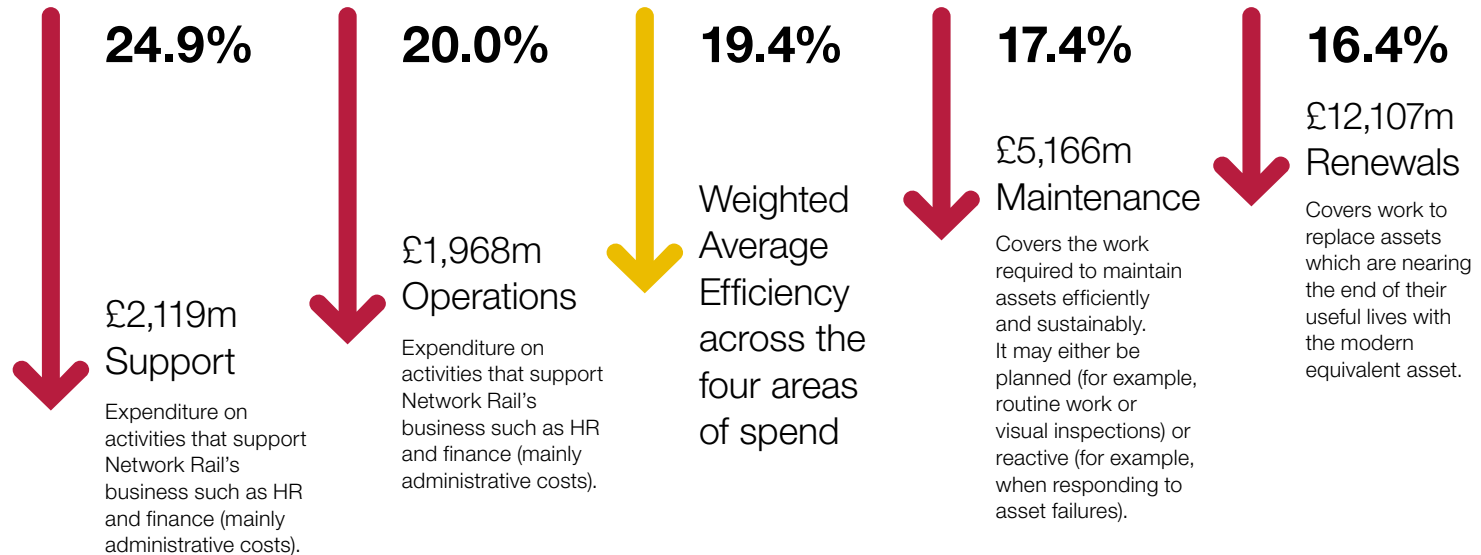
Source: National Audit Office analysis of Office of Rail and Road's Periodic Review 2013

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Performance on efficiency

In the five-year period to March 2014, Network Rail did not achieve all of the expected efficiencies. In its financial and efficiency assessment of Network Rail, the Office of Rail and Road attributed this to:

- Higher than expected labour and commodity costs for renewing sections of track.

- Not achieving a significant amount of the planned renewals efficiencies (for example, half of signalling efficiencies weren't achieved).

- Increased expenditure to improve train performance.

- An ORR penalty of £77 million for missed outputs.

- Additional reorganisation costs.

- Property dilapidation costs.

Network Rail exceeded maintenance savings efficiencies in the past two control periods but the regulator reported concerns about the effect of these savings on performance.

Control Period	CP3		CP4		
Dates	2004–2009		2009–2014		
	Target	Actual	Target	Adjusted trajectory[1]	Actual
	(%)	(%)	(%)	(%)	(%)
Maintenance	34.0	35.0	18.0	15.3	29.1
Controllable Opex	30.0	28.0	16.4	23.5	-0.9
Renewals	30.0	24.0	23.8	25.2	15.3
Total	**31.0**	**27.0**	**21.0**	**23.5**	**15.5**

Notes

1   Network Rail and the Office of Rail and Road agreed adjusted targets for CP4 in 2011, reflecting changes in the position at the end of CP3 that had been assumed when targets were set.

2   Efficiency savings are cumulative and cannot be added together.

Comparison of Control Period 4 reported efficiencies to agreed trajectory
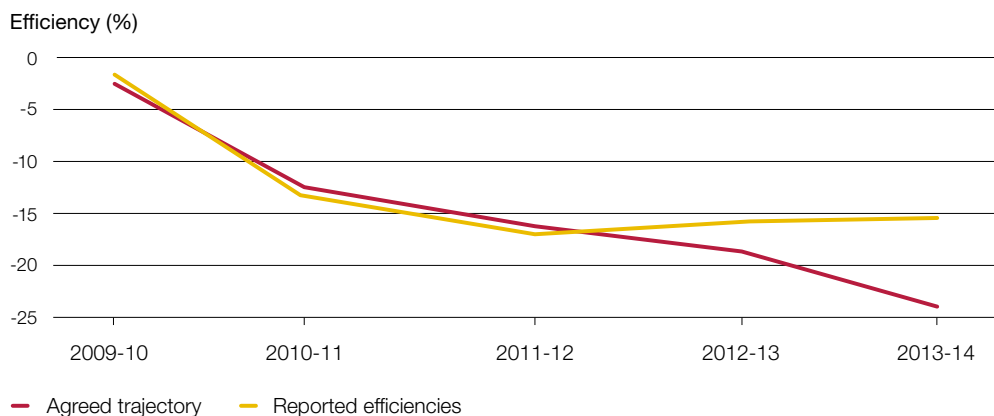
Efficiency (%)

— Agreed trajectory   — Reported efficiencies

Source: National Audit Office analysis of Office of Rail and Road's data

Staff and pay

Network Rail employed over 35,500 staff in March 2015. Staff remuneration includes salary, benefits such as discounted rail travel, pension and performance related pay (bonuses).

The salaries of its highest paid executives agreed for 2014-15 were:

- Mark Carne, Chief Executive: £675,000

- Patrick Butcher, Group Finance: £412,000

- Robin Gisby, left Network Operations in February 2015: £388,000

- Paul Plummer, Group Strategy: £364,000

In 2014, the Remuneration Committee reviewed Network Rail's remuneration policy and concluded that their policy, which had resulted in large executive bonuses, was unsustainable. They reduced the maximum bonus as a percentage of salary.

Maximum executive director bonus reduced from 160% of salary **to 20%**

Network Rail's employees by age

Number of employees

Age categories
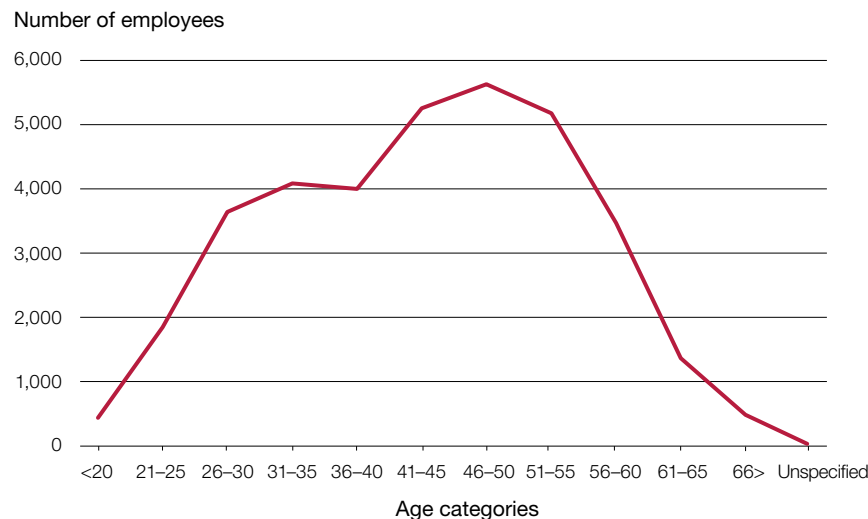
Number of employees

Salary band (£000)
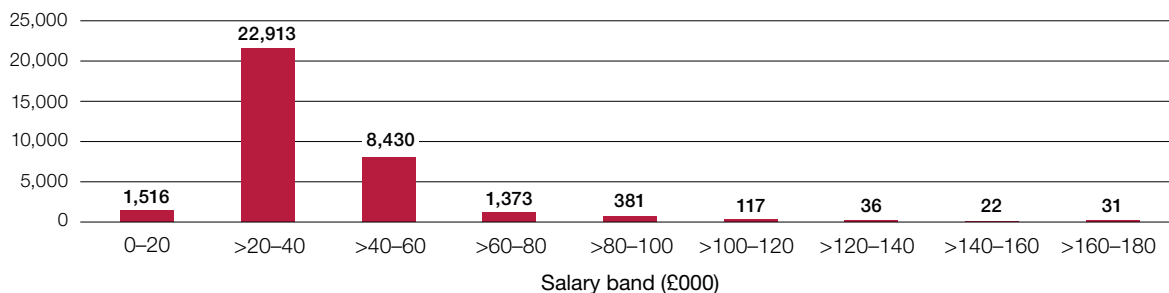
Source: National Audit Office analysis of Network Rail data

Remuneration – Executive bonuses

Network Rail's remuneration policy , which applies to all staff, includes performance related remuneration.

For executive directors, the incentive is based on both a corporate performance scorecard and targets specific to the business unit or area of responsibility for each director. Payment is up to a maximum of 20% of salary and is deferred for three years.

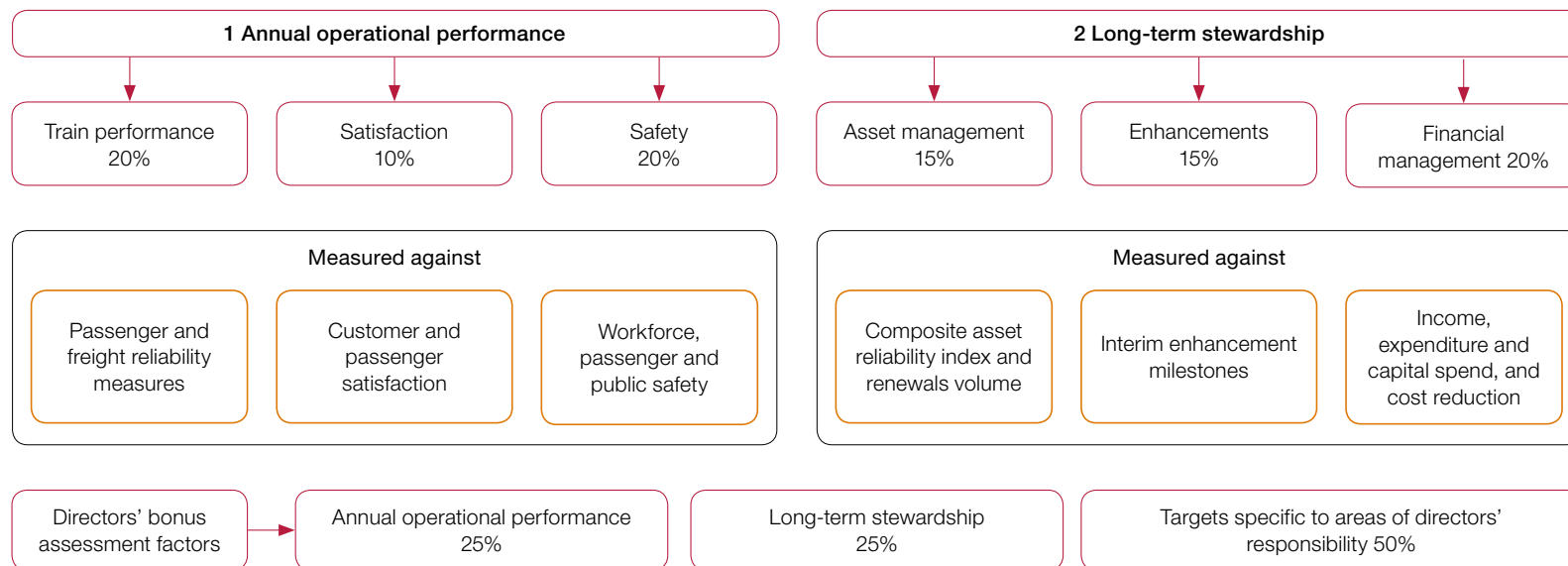As a result of problems with delivering the investment programme, the government announced on 25 June 2015, that Network Rail had decided no executive directors would receive a bonus in respect of 2014-15 performance.

Network Rail's 'corporate scorecard' is based on the following weighted performance measures, with directors' also assessed on specific targets for their areas:

1 Annual operational performance			2 Long-term stewardship		
Train performance 20%	Satisfaction 10%	Safety 20%	Asset management 15%	Enhancements 15%	Financial management 20%

Measured against			Measured against		
Passenger and freight reliability measures	Customer and passenger satisfaction	Workforce, passenger and public safety	Composite asset reliability index and renewals volume	Interim enhancement milestones	Income, expenditure and capital spend, and cost reduction

Directors' bonus assessment factors	Annual operational performance 25%	Long-term stewardship 25%	Targets specific to areas of directors' responsibility 50%

Safety

Maintaining the safety of passengers, workers and the public is Network Rail's top priority. It has a 24-hour helpline for anyone to report their safety concerns, a close call system for employees and contractors to report potential hazards, and it measures a number of safety indicators to identify areas of risk:

- Indicators of passenger safety include infrastructure problems such as broken rails, reported injuries at stations and level crossings, and when train drivers pass red signals.

- Fatalities, injuries and near misses are key indicators of work safety.

- Level crossing events are the key safety risk for members of the public.

- In its first staff survey in December 2014, 66% of staff were satisfied with safety issues.

These measures are only partially under Network Rail's control. They also depend on the behaviour of train operators, passengers, workers and members of the public.

The Office of Rail and Road regulates the safety performance of the rail industry including Network Rail and train operators. In the second half of 2014-15, it reported that:

- Network Rail had closed 118 level crossings in 2014-15.

- More action is needed to improve worker safety following a 22% increase in measures of harm in 2013-14.

Prior to reclassification the NAO did not have full access rights to carry out value-for-money reviews. We have reported on Network Rail's role in the delivery of projects for the Department for Transport and the work of the Office of Rail and Road.

A full list of NAO value-for-money reports on rail is given in Appendix Two.

Recent reviews covering Network Rail have included:

Regulating Network Rail's efficiency, 2011, in which we reviewed the incentives and information available to the regulator to drive efficiency. We highlighted that Network Rail's unusual company structure and monopoly position meant that incentives are weaker than in other regulated industries.

Progress in the Thameslink Programme, 2013, where we reported on the Department for Transport sponsorship of the programme. We found that the budget was approved while plans were immature and significant effort has been needed by the Department and Network Rail to keep within it.

Lessons from Major Rail Infrastructure Programmes, 2014, highlighted that Network Rail has delivered work on the Thameslink and Crossrail programmes under direct protocol agreements with sponsors, outside its usual regulatory arrangements.

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Network Operations
How it works

The first key business area we have focused on is Network Operations which accounts for nearly three-quarters of its workforce but less than a third of its spend.

Network Operations

Is responsible for day-to-day running of the railway – including maintenance, signalling and small renewal projects (which are less than £500,000 in value).

Most activity is devolved to eight routes.

The major components are maintenance and operations which Network Rail delivers in-house (rather than contracting work to external suppliers).

Staff

In 2013-14, 25,531 employees worked for Network Operations. Almost two-thirds of these staff were employed on maintenance works.

Network Rail will need to reduce the number of staff working on maintenance by 8% and operations staff by 16% over Control Period 5 to meet efficiency saving targets. However, overall staff in Network Operations will increase as new infrastructure projects, once completed, will need maintaining.

Overview

Network
Operations

Infrastructure
Projects

Long-term planning
for the future

Network Operations
How routes work

Each of Network Rail's eight routes is responsible for:

- Day-to-day operations.

- Maintenance and asset management.

- Planning when large infrastructure projects can be delivered.

This structure is intended to achieve financial efficiencies because it should enable work to be better coordinated. It should also provide more direct accountability to customers and users of the railway.

Each route has a managing director who reports to Network Operations and Network Rail's board. They also liaise closely with the main train operating companies on their route.

Network Rail's routes

- Scotland
- London North Western
- London North Eastern and East Midlands
- Anglia
- Western
- Wales
- Wessex
- South East
- Rail Network

Source: Network Rail data

Overview

Network
Operations

Infrastructure
Projects

Long-term planning
for the future
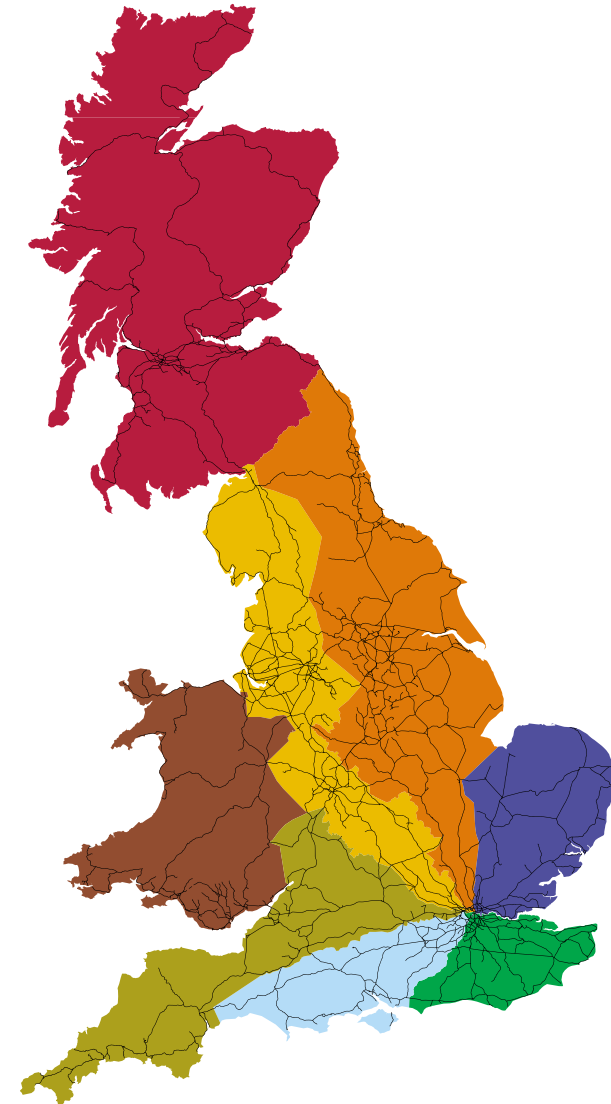
Network Operations

How much it costs

Network Rail plans to spend £9.3 billion in Control Period 5 operating the network (excluding £2.9 billion costs passed on to operators).

Over half of this spend will be on maintaining the network.

The Office of Rail and Road reported that Network Rail's delivery of maintenance in 2014-15 was mixed, with more maintenance delivered than planned in some areas but less in others. It highlighted the need for better planning and reporting by Network Rail.

Planned operating expenditure for Control Period 5
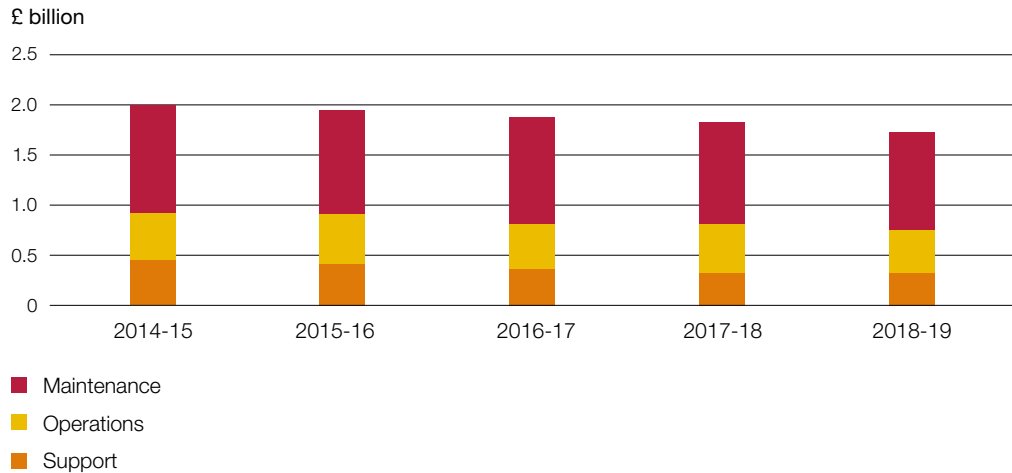
£ billion

- ■ Maintenance
- ■ Operations
- ■ Support

Note

1   Figures are given in 2012-13 prices.

Source: National Audit Office analysis of Office of Rail and Road's Periodic Review, October 2013

Network Operations

Performance

The **Public Performance Measure (PPM)** shows the percentage of trains which arrive at their terminating station on time. It combines:

- the punctuality of the train operator; and

- infrastructure reliability.

Network Operations is held responsible for any delays attributed to the infrastructure, including some outside of its direct control like the weather, trespass, vandalism or fatalities. Around 60% of passenger delays were attributed to Network Rail in the year to May 2015. The rest were attributed to the train operators.

The operators and Network Rail have a process to agree who caused each delay, and the amount of compensation due. This is separate to the passenger compensation process run by individual train operators.

Network Rail has not achieved its performance against the PPM target for each of the last four years. The Office of Rail and Road is monitoring Network Rail's activities to improve performance in 2014-15 and 2015-16, instead of imposing fines for missing the target.

Public Performance Measure
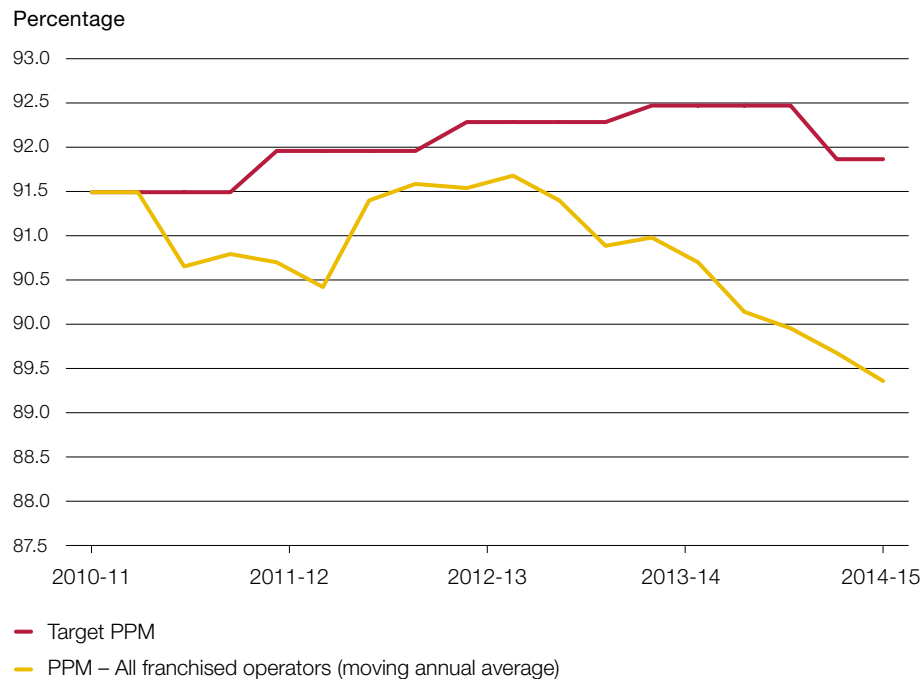
Percentage

— Target PPM

— PPM – All franchised operators (moving annual average)

Source: National Audit Office analysis of Office of Rail and Road and Network Rail data

Network Operations

Recent and future developments

Network Operations needs to improve rail infrastructure performance while meeting increased demand and achieving efficiency savings.

Recent developments

2011

Start of Offering Rail Better Information Service (ORBIS), a £330 million programme to improve asset information and efficiency of maintenance and renewals activities

2015

The last of 14 new Rail Operating Centres open, bringing Network Rail and Train Operating Company staff together to improve decision-making and communications in operating the railway

Mar 2014

Network Rail did not achieve the expected operations efficiencies in Control Period 4, from April 2009 to March 2014. It reported that it exceeded its maintenance efficiency target by 11% in the same period

2011	2014	2015

Future developments

Mar 2019

The Office of Rail and Road expects Network Rail to carry out maintenance and operations work 17% more efficiently by the end of Control Period 5

Mar 2016

End of Network Rail's performance plan to improve performance against infrastructure reliability to meet the target of 92.5% arriving at their terminating station on time

2043

To accommodate forecast freight and passenger growth for the next 30 years, Network Operations will need to make more efficient use of the network and minimise disruption

2016	2019	2043

Network Operations

Things to look out for

There has been a significant increase in demand for rail travel, a trend expected to continue through Control Period 5. Increasing demand will put pressure on Network Operations, who will need to **manage the network more efficiently to deliver the needed capacity** at congested points and to minimise disruption. Part of management's plan to achieve this is by co-locating their staff with train operator staff in new regional centres.

Network Rail will be expected to safeguard and improve train punctuality and reliability since the **Public Performance Measure** target does not change based on how many trains use the network. If Network Rail does not meet the target by the end of the Control Period, the ORR may fine Network Rail as previously occurred at the end of Control Period 4.

If Network Operations falls behind schedule in **achieving efficiency savings**, its task will be more difficult since greater efficiencies will be needed in future periods. It does not have the same flexibility to reduce work that other businesses have, as this could have unacceptable safety consequences.

Successful delivery of the **Offering Rail Better Information Service (ORBIS) programme**, to improve asset information, is key to delivering efficiencies as better information is intended to improve decision-making and lead to more effective maintenance and renewals work.

Network Operations

Around Great Britain

Network Operations staff are expected to increase by 900 during Control Period 5. Network Rail is increasing maintenance capability at both supervisor and operative level to reduce reliance on subcontractors providing extra labour and overtime.

The largest increases will be:

- in headquarters (to 1,047) to coordinate activities; and

- on the Western route (to 2,461 staff), due to planned electrification works which will need specialist maintenance staff once installed.

Staff numbers, March 2014

- ■ Scotland
- ■ London North Western
- ■ London North Eastern and East Midlands
- ■ Anglia
- ■ Western
- ■ Wales
- ■ Wessex
- ■ South East
- — Rail Network

Headquarters   650

2,320

6,441

5,514

1,314

2,254

2,047

1,669

2,790
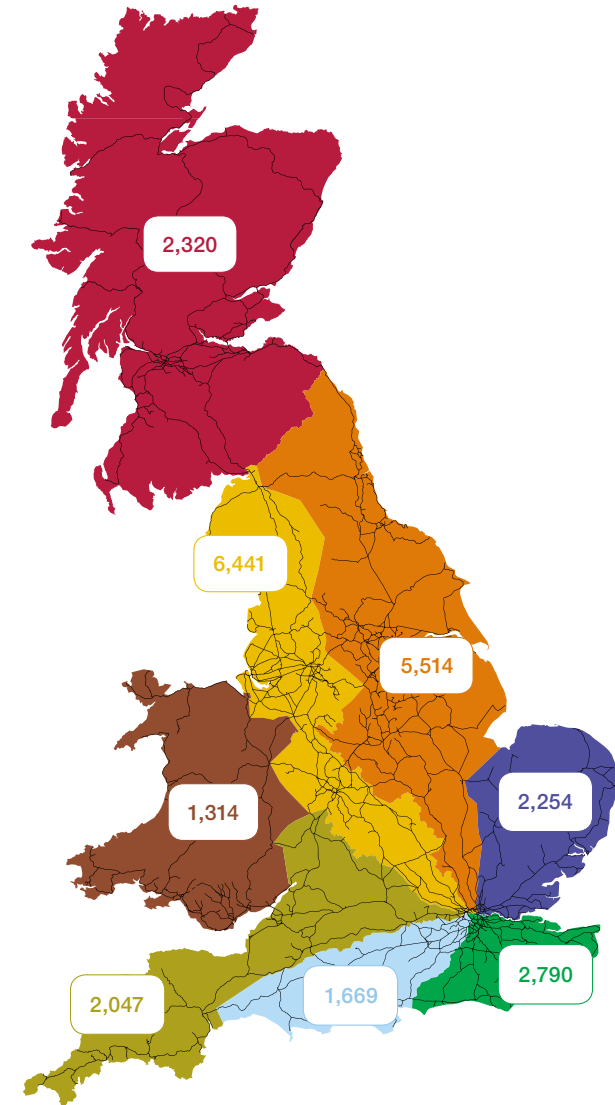
Source: National Audit Office analysis of Network Rail's data

Infrastructure Projects
How it works

The second key business area we have focused on is Infrastructure Projects which accounts for 12% of Network Rail's workforce but two-thirds of its spend.

Infrastructure Projects is responsible for large renewals projects and all enhancements of the rail network. Renewals return parts of the network to 'modern equivalent' condition. This is as new, but incorporating the latest standards. Enhancements improve the network performance and increase capacity.

The largest enhancement programmes for Control Period 5 are:

- Thameslink (increasing north–south capacity through London)

- Crossrail

- A programme of electrification

Renewing and building new infrastructure often needs parts of the rail network to be closed. Works are scheduled for quieter times like weekends and public holidays – for example Network Rail worked on 2,000 sites over Christmas 2014 – but this still causes **disruption to passengers**.

Staff and suppliers

Over 4,200 employees worked for Infrastructure Projects at the end of 2013-14. These staff project and contract manage renewals and enhancement work, which is delivered by contractors.

In 2013-14, Network Rail spent £2.7 billion on 18 of its top 20 suppliers providing infrastructure engineering and consultancy work. It spent a further £113 million on steel for infrastructure, specifically track and projects.

Infrastructure Projects

How much it costs

Network Rail plans to invest £24.9 billion on improvements to the network including:

- renewals of £12.1 billion

- enhancements of £12.8 billion.

The renewals costs are those that the Office of Rail and Road have deemed efficient, but Network Rail does not agree that all efficiency assumptions are achievable.

Planned enhancement works are significantly higher in Control Period 5, than previous Control Periods.

Enhancement project and programme costs are subject to scrutiny by the Office of Rail and Road when they are developed, called the 'Enhancement Cost Adjustment Mechanism', to confirm they are efficient.

The Office of Rail and Road reported that Network Rail fell behind plans on both enhancement and renewals work in 2014-15.

Planned investment in Control Period 5
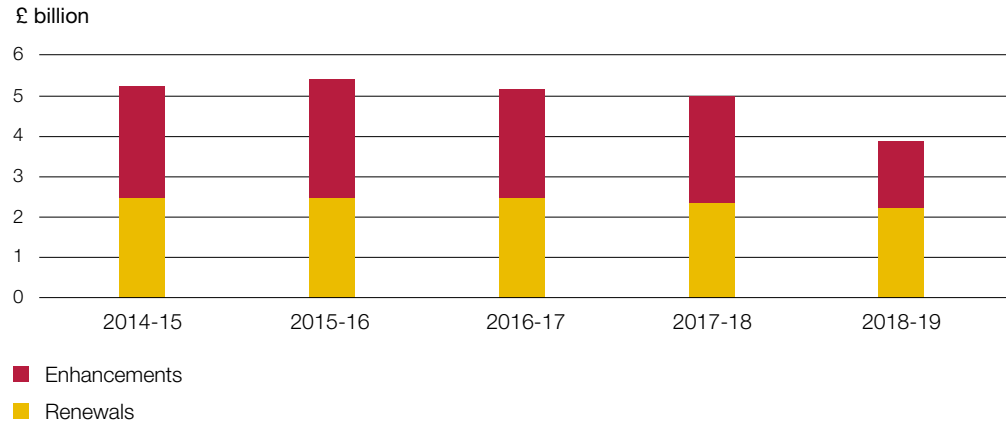
£ billion

- Enhancements
- Renewals

Note

1   Figures are given in 2012-13 prices.

Source: National Audit Office analysis of Office of Rail and Road's Periodic Review, October 2013

Infrastructure Projects

Planned delivery of electrification

Network Rail had planned a large programme to electrify lines in Control Period 5. These works were intended to deliver faster and more reliable journeys for passengers, and reduce greenhouse gas emissions. The programme was originally estimated to cost around £4 billion, 30% of Network Rail's enhancement programme.

These are the first electrification works that Network Rail has undertaken for a number of years, and early indications are that it underestimated the cost and time required for some of the projects during planning.

On 25 June 2015, the government announced that Network Rail would delay a number of projects in the current programme. The government highlighted project complexity, supply chain weaknesses for complex signalling, slow construction progress and delays in obtaining planning consent as causes of delays. The government has decided that Network Rail will focus on electrifying the Great Western Mainline, and has paused the electrification of both the Midland Mainline route and the TransPennine route between Manchester and Leeds.

Original planned electrification programme timetable at 2013

	2012	2013	2014	2015	2016	2017	2018	2019
North–West electrification	███	███	███	███	███			
TransPennine (core and to Selby)		███	███	███	███	███	███	
Great Western Mainline (Maidenhead to Cardiff)	███	███	███	███	███	███	███	
Great Western Mainline (Cardiff to Swansea)			███	███	███	███	███	
Welsh Valley Lines		███	███	███	███	███	███	███
Midland Mainline		███	███	███	███	███	███	███
Electric Spine – Thames Valley (Basingstoke to Reading)		███	███	███	███			
Electric Spine (Southampton to Basingstoke conversion to overhead lines)		███	███	███	███	███		
Electric Spine (Oxford, Coventry, Nuneaton)			███	███	███	███	███	
Electric Spine (Oxford, Bletchley, Bedford)				███	███	███	███	███
Edinburgh to Glasgow		███	███	███	███	███		

Source: Network Rail's Strategic Business Plan for England and Wales for CP5

Infrastructure Projects

Recent and future developments

Network Rail has a challenging programme of planned infrastructure projects to deliver which will electrify lines and increase capacity.
There are time and cost pressures.

Recent developments

Apr 2014

Network Rail can borrow up to £30 billion from the Department for Transport to fund enhancements of the rail network, from April 2014 to 2019. Previously it borrowed from financial markets

Jan 2015

Network Rail and the Office of Rail and Road published reviews into passenger disruption at Kings Cross and Paddington after overrunning engineering work during Christmas 2014

Key project milestones

2017–18

Great Western electrification project was originally expected to be completed in two phases:

- Maidenhead to Cardiff in 2017
- Cardiff to Swansea in 2018

| 2014 | 2015 | 2015 | 2017-18 | 2018–2020 |

Dec 2014

Cost update provided on the electrification programme:

- Great Western Main Line electrification is now expected to cost £1.7 billion (in 2013-14 prices), an increase from £1.1 billion.
- Midland Mainline electrification is forecast to cost £1.3 billion (previously £0.9 billion).

Increases are because project complexity was underestimated and to reflect inflation since original estimates were made

Autumn 2015

Network Rail will publish revised plans for its enhancement programme for Control Period 5

2018–2020

2018-19 Crossrail is expected to be completed

2018 Thameslink is expected to be completed

Infrastructure Projects

Things to look out for

The forecast costs for the planned Control Period 5 enhancement programme is higher than the agreed level of funding. Network Rail, the Department for Transport and the Office of Rail and Road are in discussions about how to address this affordability issue, which has resulted in some planned electrification projects being paused while a revised delivery programme is developed by Network Rail.

The **scale of the planned renewals and enhancements programmes** will test Network Rail's core project and programme management skills. Coupled with planned growth in infrastructure spend across the UK, there are risks of inflation to staff, materials and supply chain costs.

The Office of Rail and Road report on Network Rail's progress against **enhancement milestones** every six months. This report will provide early warning of possible delays to scheme completion (and benefits to rail users).

There are interdependencies between planned infrastructure improvements and train franchise or rolling stock procurements. For example, we reported in Procuring New Trains, that if the Thameslink Programme and Great Western Mainline electrification are delayed, the **introduction of new trains** will also be delayed which would affect distribution of rolling stock around the country.

Infrastructure Projects

Around Great Britain

Originally planned enhancement work in CP5 for England and Wales, and Scotland

12 projects costing £1.4 billion

61 projects costing £11.4 billion

⊙ Electrification of key routes

▬ Ports served by improved freight routes
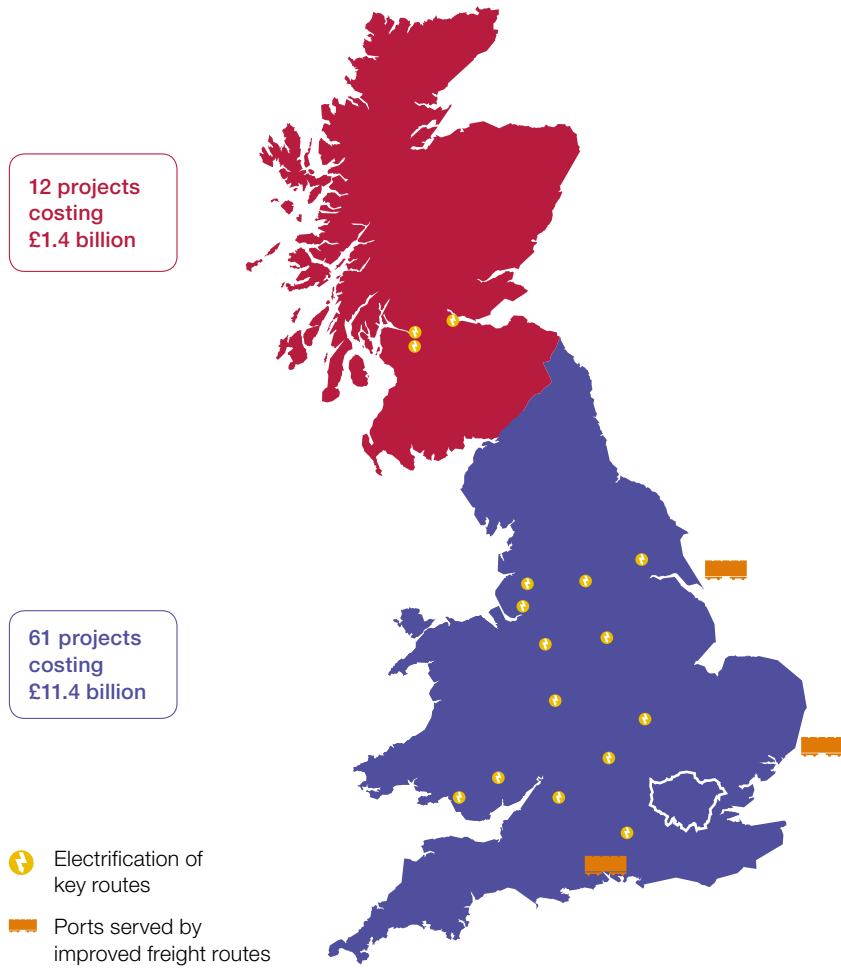
Planned renewals spend in CP5

- Scotland
- London North Western
- London North Eastern and East Midlands
- Anglia
- Western
- Wales
- Wessex
- South East
- ▬ Rail Network

£1,341m

£2,397m

£2,637m

£660m

£1,051m

£1,322m

£1,010m

£1,689m
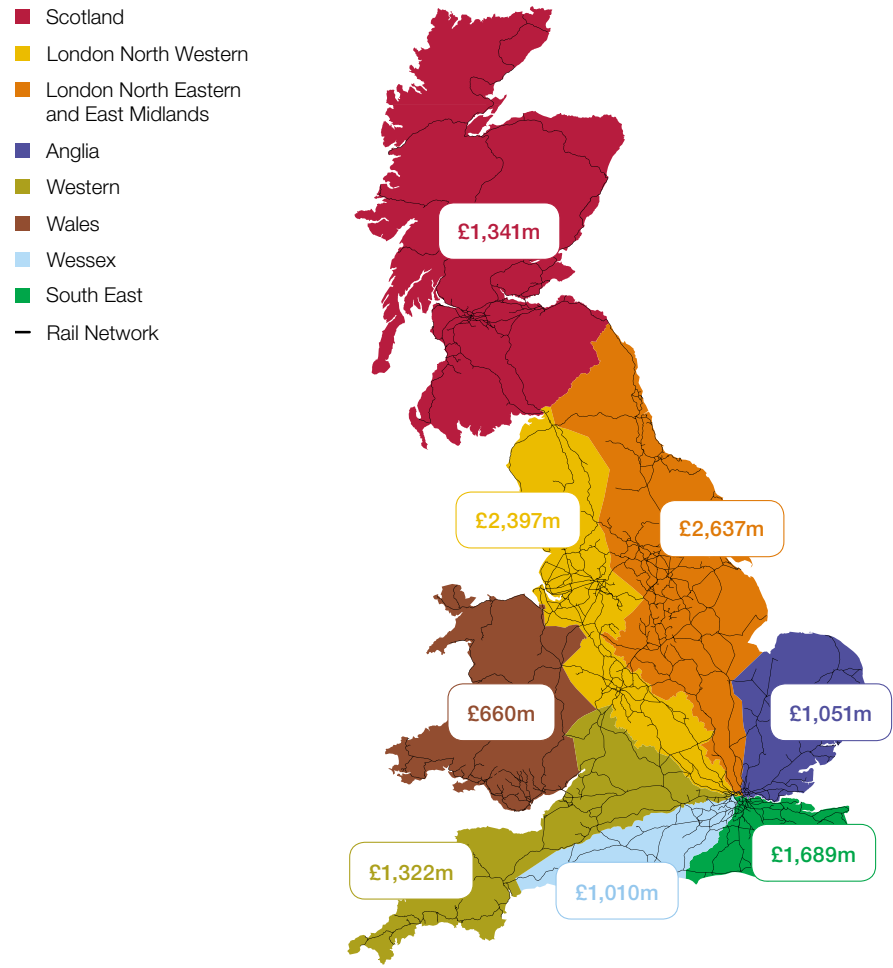
Note

1   Network Rail will publish revised plans for enhancement work in autumn 2015. It plans enhancement work by project, and no route-level breakdown is available.

Source: Network Rail's Strategic Business Plan for CP5 and Office of Rail and Road's Periodic Review 2013

Long-term planning for the future

How it works

The third key business process we have focused on is long-term planning.

Network Rail's strategic planning is structured around the 5-year control period process. This begins with the rail industry publishing its plan of investment options and priorities for the next control period, the Initial Industry Plan, informed by:

- Market studies forecasting future demand for up to 30 years for individual rail markets.

- Strategies to meet forecast demand for the eight routes.

- Information on the current and forecast condition of Network Rail's assets.

- Network-wide initiatives, such as the industry's 'Digital Railway' initiative, and government-wide transport programmes including High Speed 2.

- Improvements funded by the Welsh government or local transport bodies are agreed separately.
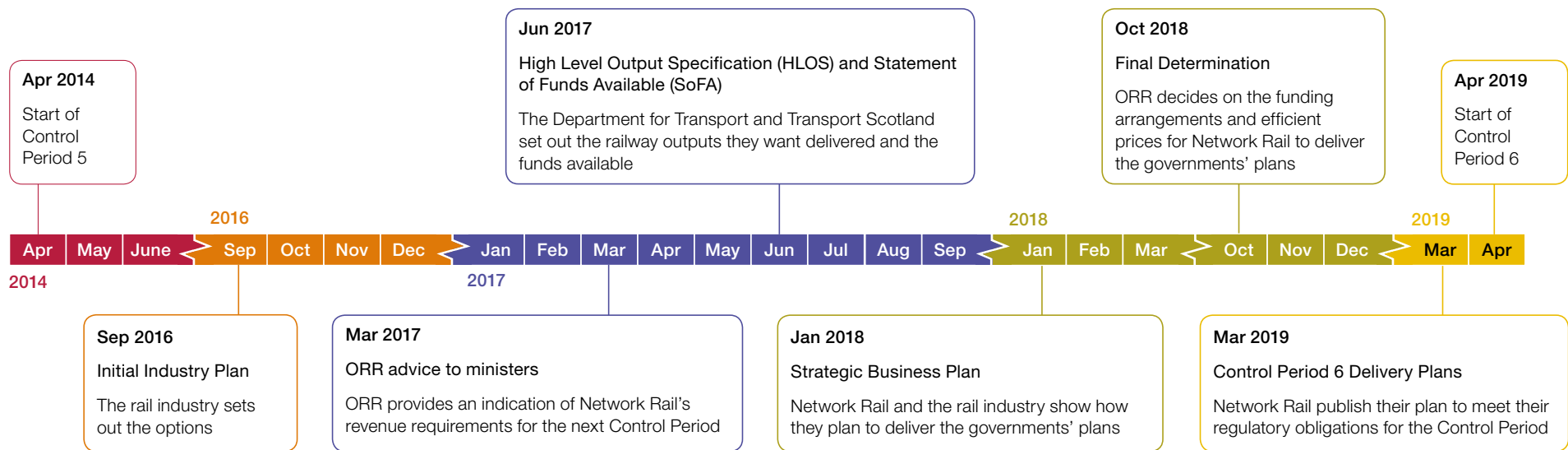
Outline timeline for developing and agreeing the Control Period 6, (CP6), settlement

Apr 2014
Start of Control Period 5

Jun 2017
High Level Output Specification (HLOS) and Statement of Funds Available (SoFA)
The Department for Transport and Transport Scotland set out the railway outputs they want delivered and the funds available

Oct 2018
Final Determination
ORR decides on the funding arrangements and efficient prices for Network Rail to deliver the governments' plans

Apr 2019
Start of Control Period 6

Sep 2016
Initial Industry Plan
The rail industry sets out the options

Mar 2017
ORR advice to ministers
ORR provides an indication of Network Rail's revenue requirements for the next Control Period

Jan 2018
Strategic Business Plan
Network Rail and the rail industry show how they plan to deliver the governments' plans

Mar 2019
Control Period 6 Delivery Plans
Network Rail publish their plan to meet their regulatory obligations for the Control Period

Source: National Audit Office analysis of Network Rail's information

Long-term planning for the future

Digital Railway

Network Rail is looking at innovative solutions to increase capacity to meet forecast future demand in addition to building new lines such as the planned High Speed 2.

A central initiative is the Digital Railway project. This is an industry programme, led by Network Rail, which aims to:

- Increase capacity on the network by rolling out in-train signalling, called European Train Control System level 3, traffic management, communications systems and the associated infrastructure to regional centres. The aim of these measures is to transform the level of automation in signalling and enable trains to run closer together without supervision.

- Improve customers' travel experiences by moving to paperless ticketing within five years to provide passengers with more flexibility to travel and develop better real-time passenger information so that they can make more informed choices on travel options.

An early version of this European Rail Traffic Management System (ERTMS), is in use in Wales. The technology will be delivered shortly for parts of the Thameslink and Crossrail programmes.

Under original plans the in-train signalling would have been rolled out by 2062. The revised target is to achieve it by 2029.

These proposals will need to be agreed and funded in future control periods. Network Rail needs to develop the business case for Digital Railway by Summer 2016, when Control Period 6 negotiations start.
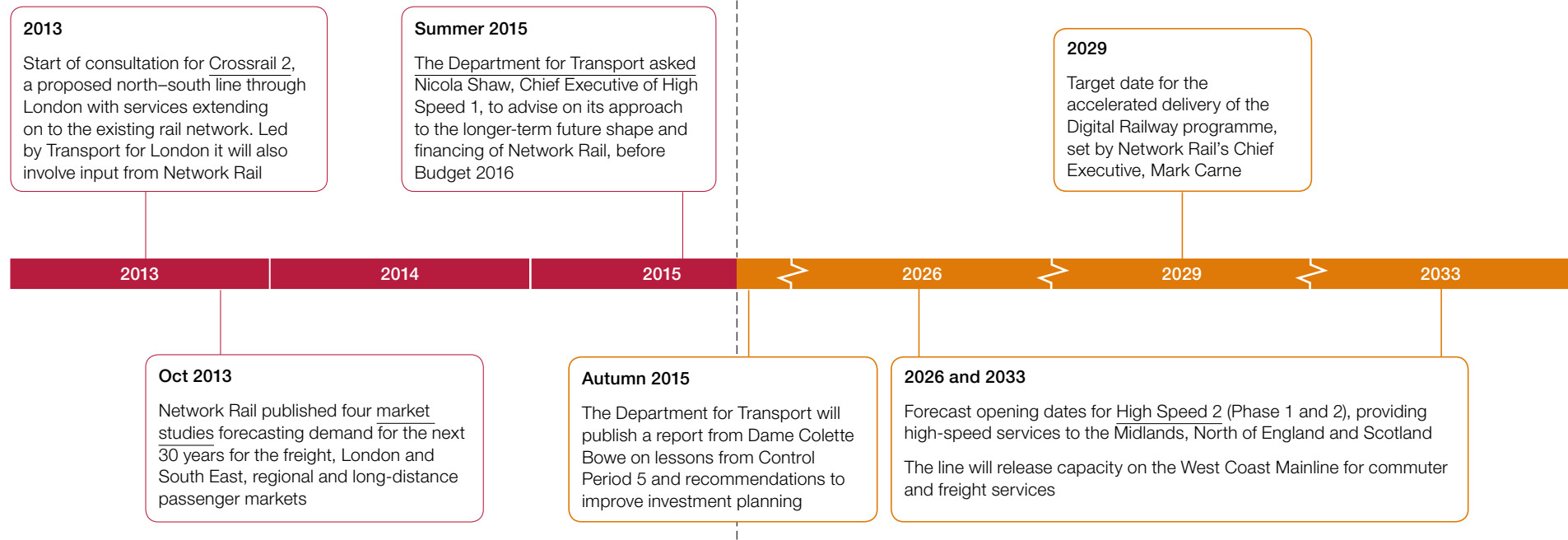
Long-term planning for the future

Recent and future developments

Plans to meet future rail demand involve increased use of digital technology and innovation in timetabling to make better existing capacity as well as building new lines.

Recent developments

Future developments

2013

Start of consultation for Crossrail 2, a proposed north–south line through London with services extending on to the existing rail network. Led by Transport for London it will also involve input from Network Rail

Summer 2015

The Department for Transport asked Nicola Shaw, Chief Executive of High Speed 1, to advise on its approach to the longer-term future shape and financing of Network Rail, before Budget 2016

2029

Target date for the accelerated delivery of the Digital Railway programme, set by Network Rail's Chief Executive, Mark Carne

| 2013 | 2014 | 2015 | 2026 | 2029 | 2033 |

Oct 2013

Network Rail published four market studies forecasting demand for the next 30 years for the freight, London and South East, regional and long-distance passenger markets

Autumn 2015

The Department for Transport will publish a report from Dame Colette Bowe on lessons from Control Period 5 and recommendations to improve investment planning

2026 and 2033

Forecast opening dates for High Speed 2 (Phase 1 and 2), providing high-speed services to the Midlands, North of England and Scotland

The line will release capacity on the West Coast Mainline for commuter and freight services

Long-term planning for the future

Things to look out for

Negotiations for the next control period, **Control Period 6**, will begin in September 2016. This provides a small window of time for future plans to be developed after the completion of Control Period 5 agreements, such as the business case for Network Rail's Digital Railway proposals. The Control Period process reduces Network Rail's flexibility to respond to initiatives but provides certainty of funding to allow work to be planned efficiently.

The Digital Railway is an ambitious project which provides huge opportunities but also faces the key challenges of **long timescales, technological risk, significant business change and the need for joint working** between the various components of the railway system in a way that does not entirely fit with the current split of responsibilities between Network Rail, train and freight operating companies, and other parts of the industry.

The **High Speed 2 programme** will impact on Network Rail's operations, because the line will link with the existing network and is likely to draw on a similar workforce and supply chain. Construction of phase one of High Speed 2 is due to start in 2017 if Parliament approve the hybrid bill as expected by the end of 2016.

Appendix One

> 1/2

Contrasting Network Rail and Highways England

There are a number of high-level similarities and differences in the scale and use of the road and rail network.
From 1 April 2015, the Office of Rail and Road now regulates Highways England as well as Network Rail.

	Highways England	Explanation	Network Rail	Explanation
Network	4,300 miles	Highways England is only responsible for the strategic road network in England	20,000 miles	Network Rail's remit covers all rail infrastructure in England, Scotland and Wales, except High Speed 1 and parts of the Heathrow Express route
Net operating costs	~£1 billion	These are the costs of operating and maintaining the existing network and do not include improvement costs	~£3 billion	These are the costs of operating and maintaining the rail and do not include renewals or enhancement costs
2013 staff	~3,350	Highways England contract out maintenance and does not have complicated traffic management operations	~35,200	Network Rail carries out maintenance in-house and needs to operate a complicated signalling system to manage train movements
Valuation of the network	£111 billion	Highways England values the road network on its replacement cost	£50 billion	The rail network is valued on future income that Network Rail expects to earn from it
2013 freight	103 billion tonne km	The majority of freight travels by road	23 billion tonne km	Rail freight is forecast to nearly double over the 30 years to 2043
2013 passengers	123 billion vehicle -km	Freight and passenger vehicles are approximately equal on the road network	72 billion passenger -km	The rail network predominantly carries passengers

Appendix Two

NAO value-for-money reports on rail

The NAO has published the following value-for-money reports, which cover different aspects of the rail system, in the last 11 years. These reports are all available on our website.

Publication date	Report title	HC number	Parliamentary Session
29 October 2014	Lessons from major rail infrastructure programmes	HC 267	2014-15
9 July 2014	Procuring new trains	HC 531	2014-15
24 January 2014	Crossrail	HC 965	2013-14
5 June 2013	Progress in delivering the Thameslink programme	HC 227	2013-14
16 May 2013	High Speed 2: A review of early programme preparation	HC 124	2013-14
7 December 2012	Lessons from cancelling the InterCity West Coast franchise competition	HC 796	2012-13
28 March 2012	The completion and sale of High Speed 1	HC 1834	2010–2012
1 April 2011	Regulating Network Rail's efficiency	HC 828	2010-11
24 March 2011	The Intercity East Coast passenger rail franchise	HC 824	2010-11
4 June 2011	Increasing passenger rail capacity	HC 33	2010-11
15 October 2008	Department for Transport: Letting Rail Franchises 2005–2007	HC 1047	2007-08
14 March 2008	Reducing passenger rail delays by better management of incidents	HC 308	2007-08
22 November 2006	The Modernisation of the West Coast Mainline	HC 22	2006-07
2 December 2005	The South Eastern Passenger Rail Franchise	HC 457	2005-06
20 July 2005	Maintaining and improving Britain's railway stations	HC 132	2005-06
14 May 2004	Network Rail – Making a Fresh Start	HC 532	2003-04