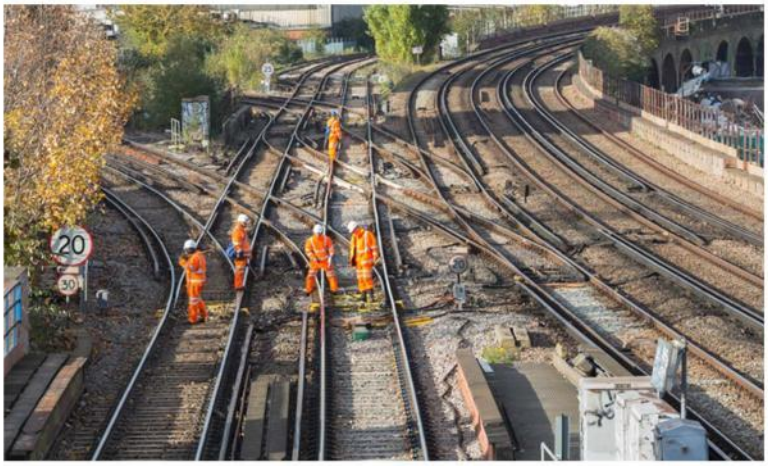
Periodic Review 2013: Draft determination of Network Rail's outputs and funding for 2014-19

June 2013

OFFICE OF RAIL REGULATION



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Foreword

This draft determination sets Network Rail's funding and the outputs we expect the business to deliver, for the five years from 2014-19. It comes at an important time for the railway as it faces the challenge and opportunity of raising standards for customers, improving efficiency, and continuing to grow.

Rail is a success story, with real progress over the last decade. On an increasingly complex and busy network passenger numbers are up 45% in the last decade and passenger revenues are up 53%; freight is growing – 17% up on 2000-01; passenger satisfaction is at record levels; the industry's recent safety record is good and underlying risks are reducing. Though we can't be complacent, the industry is among the safest in Europe. By March 2014, Network Rail should have improved its efficiency by around 40% since April 2004.

In order to sustain this progress and to retain the support and confidence of funders and customers, the industry must continue to improve. It needs to raise efficiency to reduce its dependence on public subsidy, and get more out of the existing capacity on the network. It needs to keep improving customer satisfaction by meeting the rising expectations of passengers. It needs to improve the reliability of the assets, including their resilience to climate change, and enhance the network in a more cost effective way. And businesses across the industry need to work together in a more commercial way.

All of this is necessary if expansion to meet growing demand is to be financed and delivered in a way which is sustainable.

It is in this context that we set out through this draft determination what Network Rail and its industry partners will deliver between now and 2019 for passengers, freight customers, train operators, taxpayers and suppliers:

- **passengers** will benefit from increases in capacity through a major programme of enhancements, from high standards of punctuality across all routes, and improvements at stations; and more say in what is delivered and how;
- **train operators** will have more say in the specification and effectiveness of enhancement projects and over how punctuality is delivered;
- **freight** will see further investment in infrastructure across Britain, with £230m ring-fenced for freight specific schemes: there will be a continued focus on improving the provision of infrastructure services for the freight sector;
- **taxpayers** will see the railway grow in a more cost effective, transparent and sustainable way with £2bn of savings identified; and
- **the supply chain** will benefit from the large capital programme, including the increased volumes of work on civils.

This determination is stretching but achievable for Network Rail. It rests on a wealth of analysis specially commissioned for this periodic review which gives us new insights into Network Rail's efficiency and effectiveness in delivery. It finds that Network Rail has the opportunity to improve its efficiency by 20%.

We have also looked carefully at Network Rail's record on delivery of its outputs. We have developed a determination which allows tighter scrutiny of some things – particularly asset management – but also takes a more flexible approach on capital programmes so that they can be specified and delivered by Network Rail to give the best value for money for taxpayers and consumers. The determination gives Network Rail time to make further efficiency savings so that the delivery of efficiencies can be based on sound change management which means new practices are both safe and sustainable. Network Rail will also have every reason to improve its management of network capacity, with incentives to supply more to train operators where it is sensible to do so.

We have listened carefully to what Network Rail and others in the rail industry have told us, as well as consulting rail user representative groups and funders in reaching our judgements. This is reflected in a balanced package which sets Network Rail the challenges of improving efficiency, surer delivery, sustainability in managing and delivering the railway –

all underpinned by ensuring the railway operates with the highest standards of safety. The company has incentives to do even better than the challenge we have set.

This determination helps to put Britain's rail network onto a sustainable basis by addressing the legacy of decades of under-investment in renewing the system's earthworks, tunnels and bridges, equipping the network to meet remarkable growth in demand from passengers and freight as well as rising customer expectations. It challenges Network Rail to achieve excellence in its asset management; and to manage changes in the way the railway is maintained to make sure it is safe and that improvements in both cost and quality can be sustained. It encourages Network Rail to work more closely with its customers and suppliers to raise the efficiency and performance of the rail industry as a whole. It meets the demands of the next five years, and in doing so prepares for the following decades, which will see even more change as innovation transforms the way the network is managed and maintained.

I am immensely grateful for the support and assistance that numerous parties, in the rail industry and beyond, have given us in producing a robust and well-founded review, and look forward to comments on the document as we move towards our final determination in October.

Richard Price
Chief Executive
June 2013

Summary

Introduction

1. Britain's railways have seen a period of remarkable growth and achievement over the last ten years, following decades of 'managed decline'. Since privatisation passenger numbers have doubled and freight traffic has risen by 60%. Last year, even in difficult economic conditions, the number of passenger journeys rose by 4%, and the volume of freight moved by rail saw growth of 3%.

2. Passenger revenues have risen recently by over 7% per year. Despite a more congested network, passenger satisfaction and train punctuality are at or near an all-time high. And, while we can never be complacent, the industry has a good recent safety record.

3. The growth of demand for rail – driven partly by demographics and congestion on other modes, but also by the industry's own efforts to raise its standards – is both a great advertisement and opportunity for the industry. But demand growth has also put pressure on a network which, in places, is near its capacity. Further growth of around 14% in passenger demand and 22% in freight is forecast for the next five years.

4. The governments in London and Edinburgh, as well as other funders, have shown great confidence in rail. Both freight and passenger capacity contribute to wider economic, social and environmental objectives and, for this reason, rail is a subsidised industry with current support at around £4bn a year[1]. Over the five year period of this determination, the governments have committed £18bn. That includes investing in major enhancement of the network where it is most needed.

5. Within this overall industry picture, Network Rail – Britain's national rail infrastructure provider – is currently on course to deliver a substantial programme of investment projects. It has also significantly reduced disruption to passengers and freight from engineering works, and reduced its costs.

6. Network Rail has made important changes in its internal structure, moving more responsibility away from the centre towards its devolved routes, and making changes

[1] All numbers in this summary are in 2012-13 prices, unless otherwise stated.

to how it works with the wider industry in terms of alliances with train operators and more partnership working with suppliers.

7. But, although more than nine out of ten trains run on time, the company has not in recent years met all the performance targets for which it is funded. The challenges it faces will get harder as passenger and freight demand grows (leading to more intensive use of the network), improvement projects require more engineering work on the network, and passenger expectations rise. And the pressure to reduce the costs of the railway will continue.

8. Our determination sits in this context. We aim to build on the progress that Network Rail has made, while tackling remaining weaknesses and driving the company to prepare for the even tougher environment ahead while reducing costs.

9. The determination sets the outputs, incentives and financial framework for Network Rail for the five years from April 2014, identifying the scope for the company to increase efficiency further and to improve performance.

10. In addition, it reflects the need for investment both in growing the capacity of the network, and in addressing historic underinvestment in network assets over many decades. With over £12bn of improvement projects to be completed, we have focused on ensuring that Network Rail delivers the right projects in the right way, providing the best possible value for money to taxpayers and the railway's customers.

11. We have also focused on the need for Network Rail to improve its asset management. This is key to raising efficiency, managing risks to performance and delivery for customers, the long-term sustainability of the network, and for achieving the highest standards in safety.

12. We want Network Rail to deliver on the outputs we are setting, become more efficient and more commercially responsive to the needs of its customers. We also want it to become more focused on developing the capability and innovation needed to sustain and improve its performance over the longer term.

Structure of this summary

13. The next section explains the PR13 process. It then:

    (a) sets out our analysis of the affordability of the governments' high level output specifications;

(b) describes how the PR13 determination is a balanced package in terms of required outputs, our assumptions on efficient expenditure, and the incentives and financial frameworks;

(c) explains the changes in access charges paid by operators;

(d) assesses the risks to deliverability;

(e) explains what this determination means for Network Rail;

(f) explains the impacts on affected groups;

(g) explains how we will monitor, report on and enforce delivery;

(h) discusses longer term issues; and

(i) outlines the next steps.

The PR13 process

14. PR13 determines the outputs we expect Network Rail to deliver, the income the company will receive and the incentives it will face, for the five years of control period 5 (CP5) which runs from 1 April 2014 to 31 March 2019.

15. Network Rail's revenue comes from access charges which are paid by train operators to use Network Rail's track and stations. Income is also received direct from government, as a network grant, 'in lieu of' access charges. The company also gets income from other sources such as property. In our 2008 determination (PR08) we assumed roughly 30% of revenue would be from access charges, 60% from network grant and 10% from other sources.

16. Schedule 4A to the Railways Act 1993 ('the Act') sets out the statutory process we must follow in carrying out an access charges review (such as PR13). An important part of the process involves the Secretary of State for Transport (for England & Wales) and the Scottish Ministers providing us with their requirements in terms of high level output specifications (HLOSs) and statements of funds available (SoFAs), setting out what they want to be achieved during the control period and the public financial resources they are making available. They published these in summer 2012[2].

[2] Both HLOSs and SoFAs are available from http://www.rail-reg.gov.uk/pr13/Publications/key-publications-by-stakeholders.php.

17. This document sets out our draft conclusions on PR13, on which we are consulting. It represents the culmination of two years' work since we published our first consultation document in May 2011. We have consulted extensively and worked in a transparent way and we would like to thank all those organisations and individuals who have provided input to the review. We have developed a substantial body of evidence to support our decisions. Our analysis is set out in this document, with more detailed supporting reports on our website[3].

18. Network Rail's PR13 strategic business plan (SBP) was submitted to us in January 2013[4]. It was drawn up by the company following consultation with the industry including train operators and suppliers. An industry plan was published at the same time to set Network Rail's plans in a broader context.

19. We reviewed the SBP in detail and compiled our own extensive evidence base. We have assessed the quality of the input data Network Rail has used (for example on its unit costs), its planned volumes of work and proposed efficiencies. Our decisions are supported by comparisons with how work is carried out in other industries and in other countries, based on studies by independent consultants and our own in-house analysis.

20. This determination sets out the distinct – but linked – set of decisions we have taken for Scotland and for England & Wales. This reflects the separate responsibilities that the two governments have for the strategy and funding of railway infrastructure. However, some parts of the framework are common to both, as Network Rail is one company, operating across the whole of Great Britain.

Affordability

21. In a periodic review we have to decide if the HLOSs of the Secretary of State and the Scottish Ministers are affordable given the public funds available, and taking into account industry revenues and costs. Our analysis shows that the assumptions included for other parts of the industry (e.g. franchised train operators), are reasonable. Taking into account these assumptions and our decisions on Network

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[3] See http://www.rail-reg.gov.uk/pr13/publications/consultants-reports.php.

[4] *Strategic business plan for England & Wales*, Network Rail, January 2013 and *Strategic business plan for Scotland*, *Network Rail,* January 2013 and associated documentation are available from http://www.networkrail.co.uk/publications/strategic-business-plan-for-cp5/.

Rail's funding, the cost of the Scottish Ministers' specification is slightly above the funds available while the Secretary of State's is slightly below. These numbers could change by the final determination. We must notify the relevant government if at any time we decide the specification is not affordable.

22. Although the figure for Scotland is currently negative, at this stage we consider that the gap will be closed, partly because the exact funding levels for projects in CP5 have not yet been finalised.

23. If it appears that there will be a surplus at the time of the final determination we would agree with the relevant government how this should be treated.

A balanced package

24. Our statutory duties are mostly set out in section 4 of the Act (see annex J). These include duties to have regard to any general guidance given by the Scottish Ministers and the Secretary of State. Our duties are not in any order of priority and it is for us to decide how to weigh these when reaching our decisions. In reaching our decisions, we have considered all of our statutory duties and reached a judgement about the appropriate weight to give to each of them.

25. All our decisions on the overall PR13 settlement are made as part of a 'balanced package' for CP5. The settlement may be regarded as more challenging in certain areas and relatively less challenging in others, but should be considered and judged as a whole. Our considered view is that this determination is challenging but achievable for Network Rail in terms of efficiency, value for money and deliverability. It will improve safety and it takes account of long-term needs as well as the short-term – i.e. is sustainable. Furthermore, it incentivises Network Rail to efficiently manage costs it can control.

26. We have also taken into account the Railways Infrastructure (Access and Management) Regulations 2005[5] which set out the principles we must follow in establishing the framework in which Network Rail sets access charges.

[5] Available at http://www.legislation.gov.uk/uksi/2005/3049/contents/made. These regulations were amended in 2009 by the *Railways Infrastructure (Access and Management)(Amendment) Regulations 2009*, available at http://www.legislation.gov.uk/uksi/2009/1122/contents/made.

27. The starting point for the package is the outputs that we are requiring the company to deliver.

Outputs

28. Network Rail must continue to meet its legal safety obligations, improving safety where reasonably practicable. Safety improvements will continue to be a priority and extra funding will reduce the risk at level crossings, for example by enabling the closure of more crossings. There will be new funding to improve the safety of those working with high voltage electricity on the railway.

29. There will be a major programme of improvement works with existing projects such as Crossrail, the Edinburgh – Glasgow improvement programme (EGIP) and Thameslink completed, the completion of new projects such as the electrification of the Welsh Valley lines and the expansion of the Northern Hub programme centred on Manchester.

30. Although passenger and freight demand will be growing, Network Rail should deliver this programme while ensuring that 92.5% of trains arrive on time nationally by 2019 (as measured using PPM[6]), compared to 90.9% today. It will also reduce disruption to passengers and freight customers from engineering works over the control period.

31. There will be a renewed focus on improving the worst performing services, with the performance for each franchised operator in England & Wales to reach a minimum of 90% of trains on time. This will benefit customers on routes where train service reliability has been much worse than average. Network Rail and the train operators will have the flexibility to set the 'trajectory' to reach this output. Our PR08 settlement was based on 90% being reached for all operators, with specific funding allocated, but this has not been achieved. We have adjusted Network Rail's finances in CP5 for not delivering performance outputs.

32. We will set outputs for Network Rail's asset management – its management of the network infrastructure. This is fundamental to the company's ability to improve performance and efficiency and to ensure the longer term sustainability of its assets and deliver its outputs in CP5 and beyond.

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[6] Public performance measure (PPM) is the proportion of trains that arrive at their final destination 'on time' (within five minutes for London & South East and regional services; or ten minutes for long-distance services).

33. There will therefore be new outputs for the quality of asset data, outputs to improve its asset management capability, and for the delivery of the 'ORBIS' programme[7] which will increase the effectiveness with which Network Rail deploys its asset knowledge to make decisions. Although Network Rail has improved its asset management during the current control period (CP4[8]), the pace needs to quicken to meet the challenges of CP5 and beyond. We will strengthen the focus on this area.

34. In addition to the regulated outputs we will also be expecting Network Rail to improve its approach to the environment, both reducing its own impact on the environment and improving the resilience of the network to climate change. It will be producing further plans before the start of CP5 on how it will reduce its own impact, and these will be subject to independent review and challenge. It will revise its climate change adaptation plan and re-submit this in September 2013 with its response to this consultation. We will review this for the final determination.

35. We will be monitoring and publishing other relevant information as indicators or enablers of change in the sector. For example, passenger satisfaction ratings, 'right time' performance[9] information by groups of train services and feedback from Network Rail's customers.

36. Table 1 provides a brief summary of the outputs we are setting.

Table 1: Summary of regulated outputs for CP5

Area	Outputs
Train service reliability	• Annual target for the percentage of trains on time (measured by PPM for England & Wales and Scotland, with 92.5% on time by March 2019 • All franchised operators in England & Wales to reach 90% PPM by March 2019
	• Annual target for the percentage of trains cancelled or very late in England & Wales (measured by CaSL[10]), with no more than 2.2% in this category by March 2019

[7] ORBIS stands for 'Offering Rail Better Information Services'.

[8] CP4 runs from 1 April 2009 to 31 March 2014.

[9] 'Right time' performance measures the percentage of trains arriving early or within 59 seconds of schedule.

[10] CaSL (Cancellations and Significant Lateness) measures passenger trains which are either cancelled (including those cancelled en route) or arrive at their scheduled destination more than 30 minutes late.

Area	Outputs
	• 92.5% of freight trains on time (measured by the Freight Delivery Metric[11])
Enhancements	• Wide range of improvement projects completed. Delivery milestones will be published in March 2014 delivery plan alongside development milestones for early stage projects
Safety	• Legal health and safety obligations to be met
	• Network Rail required to deliver a plan to maximise the reduction in risks of accidents at level crossings, using a £67m ring-fenced fund[12]
Disruption to passengers and freight caused by engineering works	• Disruption reduced by over 10% for passengers and 30% for freight in 2019 compared to 2014
Network capability	• Track mileage & layout, line speed, gauge, route availability, electrification at least maintained, and improved where there are enhancement works
Stations	• Minimum average condition
Asset management	• Asset management capability
	• Asset data quality
	• Milestones for 'ORBIS' data improvement project

Efficient expenditure

37. We have reviewed Network Rail's submission and collected our own evidence. In a number of areas, Network Rail's submission was a considerable improvement over PR08, but weaknesses remain. A number of documents were submitted late and with significant inconsistencies.

38. However, compared to PR08, Network Rail made much more realistic assumptions about the cost reductions that could be achieved. This is reflected in our determination where in some areas we have only made small changes to Network Rail's SBP numbers.

[11] Freight Delivery Metric (FDM) measures the percentage of freight trains arriving at their destination within 15 minutes of scheduled time.

[12] Note that safety is not a devolved responsibility so all safety related outputs, indicators and enablers apply to England, Wales and Scotland.

39. A very high level summary of our determination is shown in Table 2, with a comparison to our PR08 determination (which covers the years 2009-2014) and Network Rail's SBP. The first row looks at total expenditure and then the second subtracts enhancement spend, as the level of enhancements partly reflects what is required in the HLOSs. The third row focuses on the costs that Network Rail can most directly control.

40. Overall, our analysis shows that the costs Network Rail can most directly control[13] in CP5 should be £1,995m less than in PR08 and £1,907m less than Network Rail asked for in its SBP. Seen in the context of continued growth in passenger demand, this means that the costs of running the railway per passenger km will fall by 28%.

41. The amount Network Rail is funded for (the net revenue requirement) is £1,799m less than the company proposed[14]. This partly reflects our view that Network Rail can raise debt at lower interest rates than the company assumed.

42. Although debt levels will rise, this will be manageable for the company as the value of Network Rail's assets (the 'RAB' – the regulatory asset base) will also rise. The debt/RAB ratio will increase but will be below the limits we set.

Table 2: Summary of our determination for CP5 (Great Britain)

£m 2012-13 prices	PR08	SBP	DD
Total expenditure	35,721	40,095	37,869
Total expenditure excluding enhancements	26,425	27,706	25,630
Support, operations, maintenance and renewals costs	23,380	23,293	21,385
Net revenue requirement	29,119	29,227	27,428
Net debt / RAB	62.7%	68.8%	68.2%

43. Although we calculate a level of assumed expenditure we do not decide exactly how much money Network Rail should spend in each area of its business. We make assumptions for each main area of costs, as discussed below, but it is for Network Rail to manage its business within the overall framework.

[13] Support, operations, maintenance and renewals, see later text for definitions.

[14] The revenue requirement is different from the assumed expenditure because the cost of renewals and enhancement works is spread over time and it also includes costs such as debt interest.

44. We have reviewed **support costs,** which are mainly administrative costs such as finance, human resources and information management, but also other running costs such as utilities costs and insurance. In its SBP, Network Rail said it would need to spend £2,232m in CP5, which is £508m less than in CP4. Network Rail provided a much better justification of its support costs than it did in PR08.

45. We have assumed that it needs to spend £2,093m (5.5% of total expenditure), £139m less than it assumed, mainly reflecting that in some areas, such as information management, Network Rail can deliver more efficiencies than it included in its SBP. We expect 20% efficiency savings in core support costs compared to Network Rail's 12.3%[15].

46. **Operations costs** are those incurred in 'operating' the infrastructure, such as signalling. In its SBP, Network Rail said it would need to spend £2,027m, which is £212m less than in CP4, mainly as a result of deploying new technology to change the way it runs the network. In general, Network Rail's analysis is well founded and we broadly agree with its conclusions which will put the company at a leading position in Europe.

47. We have assumed that the required spend is £59m lower at £1,968m (5.2% of total expenditure). It can make efficiencies of 17% compared to the 13% in its SBP, mainly to reflect efficiency opportunities which cut across all spend areas and our view of achievable efficiencies in non-signaller costs.

48. **Traction electricity costs** are the costs Network Rail incurs in buying electricity. These costs have dropped significantly since the SBP, by £524m, as industry electricity prices have fallen. **Industry costs** cover items such as Network Rail's contribution to the British Transport Police. We have made a small reduction of £26m in Network Rail's assumed spend in this area.

49. Our determination numbers are presented on two bases, a 'like for like' basis which allows direct comparison with the SBP and an adjusted basis which takes account of our changes to the way maintenance and renewal spend is classified. Table 3 shows both approaches.

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[15] Efficiency is measured by comparing the last year of CP5 to the last year of CP4.

50. Good maintenance of the railway is crucial for safety and high performance. **Maintenance costs**[16] include inspection and repair of the infrastructure. In its SBP, Network Rail said it would need to spend £4,669m on maintenance, which is £884m less than in CP4. The SBP included maintenance efficiencies of 13.7%[17].

51. We have assumed that Network Rail needs to spend slightly less, £4,645m (12.3% of total expenditure) on maintenance in CP5, using the same definitions as the SBP. We have decided that efficiencies of 16.5% are achievable by the final year of CP5 compared to the final year of CP4 but we have also changed the profile of efficiencies (so the required efficiencies are lower in the early years than Network Rail assumed). This is to allow Network Rail more time to make the required changes in working methods in a safe and effective way.

52. The implications of our assumptions are that Network Rail will be able to deliver the volumes of maintenance work that it assumed in its SBP.

53. To reach our view on the further efficiencies available we have reviewed the likely resource implications of Network Rail's proposed new ways of working, and the efficiency improvements which might be obtained, for example through carrying out more automated inspections, making sure that the right work is done at the right location at the first visit and making sure that working arrangements allow the most productive use of time.

54. **Renewals** are where the existing infrastructure, such as the track, is replaced, without changing or enhancing its performance. In its SBP, Network Rail said it would need to spend £14,365m, which is £1,679m more than in CP4. The SBP included renewals efficiencies of 15.7%[18] by the final year of CP5.

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[16] In its SBP Network Rail changed the definition of maintenance to include some 'reactive maintenance' e.g. civils and buildings inspections and examinations costs (some of which were treated as renewals in CP4). We have extended this approach to a wider range of costs. This has the effect of increasing maintenance spend and reducing renewals spend compared to the SBP, so for example our assumption is that Network Rail will need to spend £5,152m in CP5 on maintenance after this change. Where possible we have presented numbers on a 'like for like' basis to make comparisons easier.

[17] Network Rail's published number is different. We have adjusted it to take into account the extra work required due to the number of assets increasing (e.g. from electrification) and traffic growth.

[18] This is our adjusted number to show clearer comparisons.

55. We have assumed that Network Rail needs to spend £12,681m (33.5% of total expenditure) on renewals in CP5, using the same accounting as the SBP[19] (£1,684m less than Network Rail assumed). To reach this view we have reviewed the volumes and costs of work required before efficiencies and the efficiency opportunities available during CP5.

56. We have made reductions where Network Rail's justification of its plans is not sufficient and where its unit cost calculations were not justified, for example in buildings, information technology (IT) and the research and development (R&D) fund.

57. We have assumed that efficiencies of 20.1% are achievable by the final year of CP5, with further efficiencies achievable beyond the SBP, for example through improved management of possessions, working more effectively with the supply chain, improved asset management systems and better targeting of work.

58. We have developed a new approach to spending on civil engineering assets. The level of civils spend (on assets such as bridges and tunnels) will rise in the short-term to address the backlog of work and hence reduce disruption to services, but the quality of information on civils assets means it is difficult to forecast exactly how much work will need to be done and at what cost. We have made a provision (of £2,362m) based on Network Rail's view of required volumes of work and our view of efficient costs, but the total spend will depend on our assessment of a plan Network Rail will produce in 2015 when it has better information. This will reduce the risk on Network Rail and improve value for money.

59. **Enhancements** are projects that improve the railway. The improvements will involve a major expansion of capacity in London (Crossrail and Thameslink) and in Scotland. There will be increased capacity and quicker journey times between our key cities, increased capacity for commuter travel into major urban areas and the improvement of rail links between major ports and airports. There will also be an expansion of electrification, improving service quality and reducing emissions. This will include the Great Western route to Bristol and South Wales, the Welsh Valleys, the North West and an electric spine from the South Coast to the Midlands/ Yorkshire for freight and passenger traffic.

[19] After adjusting for the reactive maintenance changes this is £12,173m.

60. Network Rail said it would need to spend £12,388m, compared to £11,294m in CP4. About 30% of this is for electrification, 25% is for Thameslink and Crossrail and 10% is allocated funds to achieve specific purposes such as improving the network for freight. We have reduced this to around £11.6bn after reviewing each of the projects: £10.3bn in England & Wales and £1.3bn in Scotland. We then adjusted the total levels of expenditure to allow for some extra costs that were not included in the SBP, mainly increased compensation payments to train operators for the disruption caused by the works, which brought the total to £12,239m.

61. Around £7bn of projects are at an early stage of development and hence the costs are uncertain. Fixing this cost now would involve paying a large 'risk premium'. So to ensure better value for money we have taken a new approach to setting the efficient level of costs for these projects, building on a proposal made by the Rail Delivery Group. We have made a provisional cost assessment now but we will finalise the total efficient cost in March 2015.

62. Table 3 contains a summary of our efficient expenditure assumptions compared to PR08, forecast CP4 outturn (adjusted to make it more comparable to this determination) and Network Rail's SBP.

Table 3: Summary of our CP5 efficient expenditure assumptions

£m 2012-13 prices	PR08	CP4 (adjusted)	SBP	DD (like for like)	DD
Support costs	4,113	2,740	2,232	2,093	2,093
Network operations		2,239	2,027	1,968	1,968
Traction electricity, industry costs and rates	2,175	2,349	3,701	3,114	3,114
Network maintenance	6,126	5,553	4,669	4,645	5,152
Schedule 4 & 8 costs	870	875	712	1,131	1,131
Total operating expenditure	**13,284**	**13,756**	**13,341**	**12,950**	**13,456**
Renewals	13,141	12,686	14,365	12,681	12,173
Enhancements	9,296	11,294	12,388	12,239	12,239
Total capital expenditure	**22,437**	**23,980**	**26,754**	**24,920**	**24,413**
Total expenditure	**35,721**	**37,735**	**40,095**	**37,869**	**37,869**

63. In 2010, we co-sponsored with DfT the Rail Value for Money (RVfM) study, led by Sir Roy McNulty, which reported in May 2011[20]. This helped to set the context for PR13, and established a broad range of efficiency improvements which could be achieved across the rail industry. We were pleased to see that many aspects of the study were reflected in Network Rail's SBP, so that the company approached PR13 with a better view of the available efficiency opportunities.

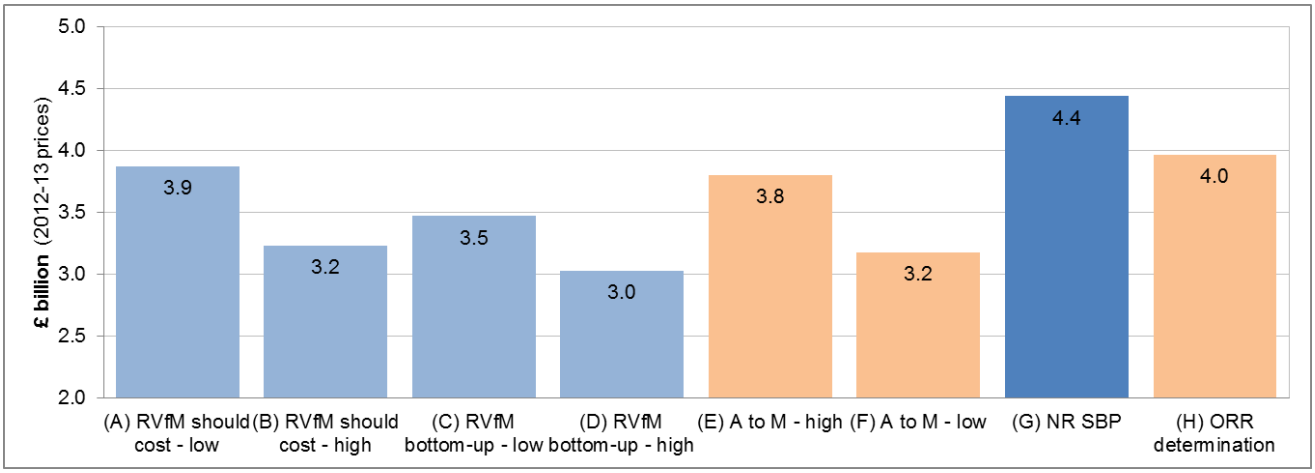
64. Figure 1 shows our expenditure (support, operations, maintenance and renewals) assumptions in 2018-19 compared to:

(a) the RVfM study, which estimated ranges for railway costs based on different methods of calculation ('should cost' and 'bottom up');

(b) The advice to ministers ('A to M' in the table) we provided in March 2012, which was also provided as a range and was designed to inform the development of the HLOSs; and

(c) Network Rail's SBP submission.

Figure 1: Expenditure comparisons 2018-19 (Great Britain)



65. In financial terms our determination is below Network Rail's SBP but above the RVfM study and our advice to ministers ranges. It is difficult to compare our findings directly with those of the RVfM study, because that study did not take account of increasing outputs or longer term sustainability issues (such as the extra volumes of civils work we now consider need to be delivered). The RVfM study also said that achieving its

[20] *Realising the Potential of GB Rail: Final Independent Report of the Rail Value for Money Study*, May 2011, available at http://www.rail-reg.gov.uk/server/show/ConWebDoc.10401.

high estimates for the industry as a whole depended on wide ranging changes across the industry. We are slightly above our advice to ministers range, reflecting the better information we now have.

66. In this periodic review we have established and drawn on a much deeper and robust base of studies, with newer evidence and analysis, than was available to the RVfM study or at the time of our advice to ministers. The review sets a strong efficiency challenge and our plans for enhancements efficiency develop this challenge further. Taking all this into account we believe that the efficiency challenge identified in the RVfM study for Network Rail itself will have been fully addressed for CP5.

67. It should also be noted that the RVfM study identified savings of £0.5bn to £1.2bn that it considered other parts of the industry, mainly train operators, could make by the end of CP5.

Incentives

Whole industry incentives

68. We have taken a new approach for enhancement projects where the scope, specification and efficient cost are currently uncertain. This will give Network Rail more time to work with the train operators, customer and business groups to get the scope of the projects right, and ensure they are focused on maximising benefits.

69. There is opportunity for the company to reduce spend by more than we have assumed in this assessment. We want to incentivise Network Rail to work with the industry to 'outperform' this determination, and benefit from this outperformance. We will set the efficient costs for the programme at the aggregate level to ensure costs are controlled. Network Rail can decide how much to spend on each project and will be able to enter into commercial arrangements with train operators such that, where the operators can help reduce costs, they can share these savings. Network Rail can include the payments to operators within the efficient cost of the project if certain safeguards are met (such as not compromising longer term considerations). Taxpayers will also share the benefits where the costs of the enhancement projects are reduced.

70. We are also introducing a new efficiency benefit sharing scheme to encourage further savings to be made in the day-to-day running costs of the railway. This will apply at the Network Rail route level. Network Rail is increasingly devolving responsibilities to

its ten operating routes and this new mechanism, called REBS[21], will build on this. We expect operators to work closely with Network Rail and if Network Rail's costs are lower than we assumed the operators will share the savings but if they are higher then operators will shoulder part of the increase. DfT has said that for new competitively let franchises, the franchise agreement will allow train operators to benefit from REBS (but this will not apply to negotiated direct awards with existing franchisees). Transport Scotland will allow the new ScotRail franchise to benefit from REBS.

71. The existing volume incentive, which encourages Network Rail to look for ways to increase passenger and freight travel by working more closely with train operators, will be strengthened and the company will need to demonstrate how its decisions take the incentive into account.

72. We are working with Network Rail to develop indicators to measure its 'system operator' capability – how well it plans and timetables the network and balances competing customer needs. This will lay the foundations for better use of network capacity in the future.

Incentives to reduce disruption to customers

73. We have updated the Schedule 8 and Schedule 4 regimes which are in track access contracts. The Schedule 8 regime covers the punctuality and reliability of train services. For example, if the lateness of trains increases above a set benchmark because a Network Rail asset fails, Network Rail makes a payment to the affected train operator. The level of payment is based on the likely revenue loss to the operator and these payment rates have been increased to reflect factors such as the higher levels of traffic on the network. These payment rates are also used in the Schedule 4 regime which compensates train operators for the disruption caused by engineering works. Schedule 4 costs have therefore also increased. These increased payment rates significantly strengthen the incentive on Network Rail to reduce disruption to customers, which supports the output requirement to reduce disruption.

Financial assumptions

74. We have funded Network Rail for its efficient financing costs. Network Rail has no shareholders and therefore no dividend requirements. Hence its financing cost is the interest it pays on its debt. Interest rates are currently very low and are expected to

[21] Route-based efficiency benefit sharing.

remain low for some time. Network Rail also benefits from a financial indemnity mechanism (FIM) which means that all its debts are guaranteed by the UK Government.

75. We have removed the existing annual 'risk buffers' (of around £250m a year) which Network Rail currently receives to protect it against financial risks. In CP5, Network Rail will be able to use its balance sheet for protection against financial risk. That is, it can raise extra debt in the event that (say) costs are above forecast. But there needs to be limits to this process and we are retaining Network Rail's licence condition restricting its level of debt as a proportion of its assets, as it incentivises Network Rail to control its costs[22] and provides important protections to the public purse. Our current thinking is that the ratio of debt to assets should not exceed 70-75%.

76. Table 4 below describes how we arrive at Network Rail's revenue requirement, showing how we combine our expenditure and financial assumptions.

77. Operating costs[23] are added to an allowance for amortisation (depreciation) which is the average long run level of renewals required to keep the network in steady state. We then calculate the return that shareholders would require if Network Rail was funded by equity (the cost of capital multiplied by the asset base) before deducting the 'equity surplus' as the company is not funded by equity. We do this to be transparent as it is still important to identify Network Rail's cost of capital to encourage Network Rail to invest efficiently, achieve the appropriate balance between maintenance and renewals, and ensure a level playing field (between Network Rail and potential competitors) for the delivery of enhancements. We are setting the cost of capital at 4.31%.

78. The adjusted allowed return of £5,987m (the forecast actual cost of finance) in our determination is £2,389m lower than Network Rail's SBP. This is primarily due to our assumption of a lower cost of nominal debt issued (around £1,700m reduction) and a lower FIM fee [24](around £270m reduction).

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[22] This is because, unless we have consented otherwise, Network Rail could be in breach of its network licence if it does not use reasonable endeavours to ensure that its total financial indebtedness does not exceed the limits specified in that licence.

[23] Operating costs are support, operations, traction electricity/industry costs and maintenance

[24] This is the fee Network Rail pays to the UK Government to reflect the benefit it receives from having its debt backed by the UK Government through the financial indemnity mechanism.

79. We then look at financial indicators and adjust the level of amortisation so that Network Rail's financial sustainability is not unduly affected by this approach (hence the term 'financial sustainability adjustment'). This gives the gross revenue requirement. But Network Rail earns income from 'other single till income' sources such as property. This money is deducted from the gross revenue requirement to leave the net revenue requirement, which is the amount that needs to be recovered from access charges or network grant. We have assumed Network Rail can generate £376m more income from property than it assumed in its SBP.

Table 4: Our determination of Network Rail's CP5 revenue requirement (Great Britain)

£m 2012-13 prices	PR08	SBP	DD
Operating costs (including Sch. 4 & 8)	13,284	13,341	13,456
Amortisation (long-run steady state)	8,903	10,540	9,794
Tax allowance	-	-	18
Release of opex memorandum account	-	138	115
Gross revenue requirement before cost of capital	**22,187**	**24,019**	**23,384**
Allowed return (real cost of capital)	10,455	13,092	11,267
Less: Real equity surplus	-	(4,716)	(5,280)
Adjusted allowed return	10,455	8,376	5,987
Gross rev. req. pre-sustainability adjustments	**32,642**	**32,395**	**29,371**
Additional amortisation (financial sustainability adjustment)	-	970	2,379
Gross revenue requirement	**32,642**	**33,365**	**31,749**
Less: Other single till income	(3,523)	(4,138)	(4,321)
Net revenue requirement	**29,119**	**29,227**	**27,428**

80. Network Rail's net revenue requirement in CP5 is, overall, £5.5bn per annum in Great Britain, and £4.9bn per annum in England & Wales and £0.6bn per annum in Scotland.

Access charges

81. In setting the framework for charges, we are seeking to improve the extent to which charges reflect costs. By ensuring that a greater proportion of Network Rail's costs are recovered through charges, we could reduce the company's reliance on public funding. And by making charges more cost reflective we can improve incentives for Network Rail to manage the provision of network capacity more efficiently, and for its customers to use that capacity efficiently. In our view, it would be beneficial for new

franchises to expose train operators to changes in charges, strengthening their incentives to work with Network Rail to reduce its costs. This would further improve value for money for funders and users.

82. There are three main types of track access charges[25]. The first type, reflecting costs directly incurred, includes the variable usage charge (which covers infrastructure wear and tear costs) and the capacity charge (which covers Schedule 8 costs that vary with traffic). Costs directly incurred essentially cover short-run marginal costs. The second type of charge, 'mark-ups' above costs directly incurred, allow more of Network Rail's costs to be recovered in certain circumstances. The third type, fixed charges, covers Network Rail's remaining costs net of other single till income. Not all rail traffic pays every charge – for example only franchised passenger operators pay the fixed charge.

83. It is our role to set the framework within which Network Rail has responsibility for calculating its track access charges. It has undertaken a major programme of work with extensive consultation and industry engagement. In broad terms this analysis pointed to substantial increases in charges in some areas, particularly in variable usage charges for bulk traffic and capacity charges, to reflect the latest information on costs.

84. One mark-up charge already exists – for freight only lines. We are introducing a new freight specific charge (FSC) covering coal for the electricity supply industry, spent nuclear fuel and iron ore, so that the charges cover more of the costs incurred. These are the commodities that are able to bear a mark-up[26]. The latest information on freight avoidable costs[27] suggested that these commodities should face a significant mark-up.

85. We also consulted on introducing a FSC for biomass, but after considering the responses to our consultation we have decided not to introduce this charge.

86. The cumulative impact of the planned changes to charges for costs directly incurred and the FSC would produce very large increases in charges, particularly for freight

[25] There is also a station access charge called the station long term charge.

[26] There are various legal requirements for a mark-up including that the charge does not price market segments off the network.

[27] Freight avoidable costs are the reduction in infrastructure costs that would occur long term if commercial freight traffic did not use the network.

traffic. We received strong representations, for example from the rail freight industry and its customers, on the likely impacts on businesses. We have sought to improve the extent to which charges reflect costs, and the latest evidence pointed to much higher charges, but we also need to balance our statutory duties in making decisions. We have consulted extensively and discussed our analysis with the businesses and organisations that would be affected.

87. We had previously announced caps on the average variable usage charge for freight. We have now decided to cap the increase below the level we had announced earlier, with the caps designed to make charges as cost reflective as possible. We have also capped the FSC below the level implied by our original announcement.

88. We have concluded that we will not implement the recalibrated capacity charges as part of PR13. We will instead either implement the alternative proposal put forward by freight operators (possibly applying it also to open access passenger operators and/or franchise passenger operators, having regard to their views on this), or approve capacity charge rates that have been calculated using the methodology established in CP4, uprated for inflation.

89. Network Rail is currently consulting on charter charges which, combined with the introduction of a benchmark for charter performance payments, we expect to be broadly financially neutral overall.

90. In summary, we now estimate that the impact of our determination will be that in real terms, average total freight charges will increase by around 21% on current levels by 2018-19, equivalent to 4% a year average. For commodities not affected by the FSC, the corresponding increases are 5% on current levels by 2018-19 and 1% a year on average. Increases in charges will be phased in to give businesses more time to adjust. The variable usage charge increases and the FSC will be phased in from April 2016, reaching the full capped level only in 2018-19.

91. We estimate that average total franchise passenger variable charges and open access variable charges will each increase by 1% from CP4 to CP5 in real terms. We will shortly consult on options to allow passenger open access operators greater access to the network in return for some contribution to fixed costs.

92. The actual prices paid will vary by (for example) type of vehicles and in the case of freight, commodity. Network Rail will publish detailed draft price lists in July 2013, consistent with our decisions.

Deliverability

93. We have considered the risks to this determination. We have reviewed whether the outputs can be delivered and whether our assumed levels of efficiency are achievable.

94. We assessed whether the total programme of engineering work (for maintenance, renewals and enhancements) can be delivered. Although the overall volume of work is likely to be higher than in CP4 the main risks are around the mix of work and its location.

95. On the mix of work, signalling volumes almost double compared to CP4 and the electrification programme is much bigger. The implementation of the European Rail Traffic Management System (ERTMS) raises technology and operational challenges. There are concentrations of work on the Great Western Main Line out of Paddington and on the Thameslink route, making access more difficult.

96. We have focused our work on risks to ERTMS implementation, the resourcing of the electrification work, the Great Western Main Line work and on Network Rail's programme management of many sub-projects (as in the Northern Hub work). We have noted that Network Rail is improving how it works with the supply chain.

97. The early stage of development of many enhancement projects adds a layer of uncertainty to the analysis, but overall we have concluded the work is deliverable, although strong programme and risk management will be crucial.

What does the determination mean for Network Rail?

98. There is no doubt that this settlement represents a sizeable challenge for the company. And it is right that it should.

99. But it is in everyone's interest that Network Rail is 'set up to succeed' and hence the determination includes checks and balances which are designed to give Network Rail, and the industry, flexibility to respond.

100. While the overall outputs requirements are demanding, we have provided some flexibility. For example, we have set the output for reducing disruption to passengers

for the end of the control period, so that Network Rail and the industry can decide the most sensible trajectory to reach that point, taking into account the large investment programme.

101. We have taken a different approach to civils spend and to enhancements at an early stage of development, as described above.

102. We have also carefully considered the lessons of CP4. When Network Rail tried to make efficiency savings in maintenance in CP4, it did not manage the change well in some respects. We have reduced the level of efficiency improvement required at the start of the control period for maintenance compared to Network Rail's SBP to give the company more time to plan the necessary changes and implement them effectively. Effective delivery is essential if longer term efficiency gains and service quality improvements are to be secured and locked-in for the future.

103. And, if there is a material change in the circumstances of Network Rail or in relevant financial markets, there is provision for the determination to be re-opened. This provides further protection against risk to Network Rail.

104. Network Rail is implementing changes which should put the company in a better position to meet the challenges. These include devolving more responsibility to its routes, collaborating more effectively with customers and suppliers and taking forward programmes to change the culture within the organisation.

The impact of this determination

105. Network Rail's delivery of this settlement will result in significant benefits to passengers, freight customers, train operators, taxpayers and suppliers.

Passengers

106. Passengers will benefit from the increases in capacity which will allow new services to be introduced to reduce overcrowding, from improving levels of train service reliability and requiring improvements on the worst performing services and from improvements at stations based on the ring-fenced funds made available. We expect safety to improve.

107. We will publish a wider range of data to help passengers understand railway finances and performance and passenger groups will be more involved in the development of

enhancement projects. We will monitor levels of passenger satisfaction through the National Passenger Survey and customer research.

Train operators

108. Train operators will be able to benefit from the new incentives to work with Network Rail to reduce costs and the opportunity to work with Network Rail to improve the specification and effectiveness of the enhancement programme.

109. There will also be flexibility for passenger train operators to agree joint performance improvement plans to deliver the performance outputs with Network Rail so that these can better represent local opportunities and constraints.

110. Freight operators will benefit from the continued investment in the strategic freight network and the new output for freight performance. Increases in access charges have been capped and phased, as described in the access charges section of this summary.

111. We will monitor the impact on train operators through direct feedback, the new customer satisfaction measures that Network Rail is developing, and the new 'system operator' indicators (which will measure for example how well Network Rail is using the capacity of the infrastructure).

Taxpayers

112. Taxpayers will see the railway grow in a more cost effective and sustainable way, with more transparency over what it delivers and for how much money. The improvements in performance and to the network will also facilitate economic growth and greater competitiveness.

Supply chain

113. The supply chain will benefit from the large capital programme, including the increased volumes of work on civils, and given the early stage of development of the programme there will be considerable scope for supplier involvement in scheme design. The scale and duration of the work programme will give greater confidence to invest and innovate. There will be longer term benefits through the funding for research. We have also funded Network Rail to develop CP5 projects during CP4 to avoid any 'hiatus' in orders between control periods.

Monitoring and reporting

114. We will continue to monitor Network Rail taking a 'forward looking risk based approach'. That means we assess whether Network Rail is likely to deliver its obligations, intervening where necessary to ensure the obligations are delivered, focusing on the major risks.

115. But we will be changing some aspects of our CP4 approach. We will need to expand our monitoring to include the new areas, such as the asset management outputs. And we will need to develop the new mechanisms we have put in place for assessing civils spend and early stage enhancement projects, to make sure these deliver value for money.

116. We will continue to report regularly on Network Rail's delivery, but there will be wider benefits from the extra transparency this determination will bring. We will publish more information at a greater level of geographical disaggregation (at Network Rail route level) to help local decision makers. We will also publish more detailed information to enable passengers to get a better understanding of the service they are getting (including information on 'right time' performance and the extent of use of buses instead of trains during engineering works). Passengers, business groups and operators will be more involved in the development of enhancement projects and in decision making processes such as how the ring fenced enhancement funds are spent.

The longer term

117. Many of the changes will have a longer term impact, in particular moving Network Rail to a position where it has excellent asset data so it can make well informed decisions. Network Rail and the industry in general will also benefit from the innovation fund in the Secretary of State's HLOS which should drive cost reduction and quality improvements in the future. We did not accept Network Rail's proposal for a £300m R&D fund as it was not well justified. But we do recognise the importance of research and development in reducing costs and improving service quality over the longer term. Accordingly, we will – subject to Network Rail making acceptable proposals – strengthen the financial incentives on the company to invest in R&D in a commercially-led way.

118. Our determination does not stop risk capital, such as unsupported debt, from being introduced into Network Rail in the future. Nor does it obstruct the development of

further alliances or an infrastructure concession. In the event of future industry reforms or other significant changes, we will consider any adjustments to the determination, on a case-by-case basis. So, material changes would lead us to consider re-opening the determination, whereas the impact of small changes could be handled through a subsequent financial adjustment. We are not aware of any current plans which would trigger any such reopener.

119. Network Rail's debt is forecast to rise from £30,242m at the end of 2013-14 to £40,118m by 2019, although its assets will also grow in value. The rise in debt largely reflects the funding of renewals and the large enhancement programme. We forecast that Network Rail will spend on average around £1,200m a year servicing the debt in CP5. Under reasonable assumptions debt could continue to rise in future control periods and there will need to be a debate within government and the industry about how sustainable this is.

120. We will shortly be publishing our long-term regulatory statement. This is intended to set PR13 in the context of a longer term time frame, looking at issues such as longer term financial sustainability and the further alignment of incentives to deliver even greater value for money.

Next steps

121. Table 5 shows the timetable for the remainder of PR13. The deadline for responses to this draft determination is 4 September 2013 (details of how to respond are in chapter 1). Network Rail's delivery plan will include milestones for all the enhancement projects, following a consultation.

Table 5: Timetable for the remainder of PR13

Formal review phase	
12 June 2013	We publish our draft determination.
12 July 2013	Network Rail publishes its draft price lists based on the charging framework set out in our draft determination. This will provide an opportunity for stakeholders to review and comment to Network Rail on the draft price lists (as once approved in December 2013 these are fixed for CP5 unless ORR re-opens the determination).
12 July 2013	We consult on the changes we propose to make to track access contracts and network licence provisions to implement our determination.
July 2013	We publish our draft long-term regulatory statement.

Formal review phase	
4 September 2013	Deadline for responses to our consultations on our draft determination and proposed changes to track access contracts and network licence provisions.
31 October 2013	We publish our final determination.
December 2013	Network Rail publishes draft delivery plan for consultation.
Implementation phase	
20 December 2013	Final access charges (price lists/charge schedules) produced by Network Rail are audited and approved by us.
20 December 2013	Review notices are served which start the formal implementation of PR13. The review notices set out the proposed changes to track and station access contracts and the network licence.
7 February 2014	Network Rail will then have until 7 February 2014 to object to the review notice. If it objects, then we would either issue a revised notice or make a reference to the Competition Commission.
February 2014	If Network Rail does not object, we will issue a 'notice of agreement' shortly after 7 February 2014. This will give beneficiaries to track and station access contracts (e.g. train operators) 28 days within which to give notice that they wish to terminate their access contracts, should they wish to do so.
March 2014	Assuming we issue a notice of agreement in February 2014, we would then expect to issue our review implementation notice in March. This confirms that the periodic review will be implemented on 1 April 2014.
By 31 March 2014	Network Rail publishes its delivery plan for CP5.
1 April 2014	Our PR13 determination is implemented and CP5 begins.

1. Introduction

Purpose of this document

1.1 The 2013 Periodic Review (PR13) is the process through which we determine the outputs that Network Rail is expected to deliver, the efficient cost of delivering those outputs, and the access charges the company can levy on train operators for using its network to recover those costs.

1.2 It covers the period from 1 April 2014 to 31 March 2019, which is called CP5 (control period 5). PR13 also establishes the wider 'regulatory framework' for CP5. This includes the financial framework within which Network Rail will operate and the incentives that will act on both it and train operators (and through them on suppliers and rolling stock companies) to deliver and outperform our determination.

1.3 This document sets out our draft determination on PR13. It includes our overall judgements and decisions on:

(a) the outputs that Network Rail must deliver in CP5;

(b) how much Network Rail needs to spend to deliver its outputs and its other commitments, including the interest it must pay on its debt;

(c) the financial framework within which Network Rail will operate in CP5;

(d) the incentive mechanisms to encourage Network Rail and its industry partners to deliver and outperform our determination; and

(e) the affordability of what the Scottish Ministers and the Secretary of State want the railway to deliver in Scotland and England & Wales respectively, as set out in their high level output specifications (HLOSs).

Structure of this document

1.4 The structure of this document is shown in Table 1.1 below.

Table 1.1: Structure of this document

Chapter & Title		Description and purpose
Introduction and background		
1	Introduction	Gives an overview of the purpose and structure of this document.
2	Background and context	Sets out the legislative and regulatory background to PR13 and the wider context for the industry.
Outputs, efficient expenditure, deliverability and health & safety		
3	Output framework	Sets out the outputs that Network Rail will be required to deliver during CP5 and the framework of enablers and indicators.
4	Overview of efficient expenditure	Gives a brief overview of how we assess efficient expenditure, and sets out the crosscutting issues and assumptions that apply across different areas of expenditure.
5	Support expenditure	Describes our assumptions on the level of efficient expenditure for Network Rail's support costs (e.g. human resources and insurance).
6	Traction electricity, industry costs and rates	Describes our assumptions on what Network Rail will need to spend on purchasing the electricity it uses and that it sells on to train operators (e.g. to power trains), the costs of funding industry groups and rates.
7	Operations expenditure	Describes our assumptions on the level of efficient expenditure required for Network Rail to operate and control its network infrastructure (e.g. through the signalling system).
8	Asset management: maintenance and renewals expenditure	Sets out our review of Network Rail's asset management proposals and our assumptions on the level of efficient expenditure required for Network Rail to maintain and renew its network efficiently.
9	Enhancements expenditure	Provides our decisions on the efficient enhancements required to deliver the high-level outputs set by the two governments, and our assumptions on costs. It also sets out the arrangements for the specific funds that the governments are making available.
10	Deliverability of engineering work	Sets out our decisions on Network Rail's ability to carry out the engineering work required to deliver its maintenance, renewals and enhancement programme.
11	Health and safety	Explains how we have ensured that our overall decisions on PR13 are consistent with Network Rail's obligations to maintain and improve health and safety.

Chapter & Title		Description and purpose
Financial framework and revenue requirement		
12	Financial framework	Explains our decisions on the financial framework that Network Rail must work within.
13	Impact of the financial framework on financial parameters	Sets out our assumptions on Network Rail's cost of capital, its financing costs, the level of the regulatory asset base (RAB) and net debt levels at the start of CP5 and other important financial information. These assumptions are used to calculate Network Rail's revenue requirement.
14	Network Rail's revenue requirement	Summarises the revenue that Network Rail will require in CP5 to deliver its outputs in England & Wales and Scotland.
Incentives framework, access charges and other income		
15	Overall incentives	Gives an overview of the importance of the incentive framework that we put in place through PR13 which will apply to Network Rail and other industry parties.
16	Access charges	Sets out the decisions we have made on the charging framework for CP5, including the overall level of particular charges.
17	Network grant	Describes the options that we have identified for the level of the network grant payments that we will allow Network Rail to receive from DfT and Transport Scotland in lieu of fixed track access charges.
18	Other single till income	Sets out our assumptions on the amount of income we expect that Network Rail will be able to receive from sources such as property.
19	Financial incentives	Sets out our decisions and proposals on financial incentives to encourage greater efficiency, innovation and incentivise Network Rail to be more responsive to demand from its customers for additional network capacity.
20	Possessions and performance regimes	Provides our decisions on the financial compensation regimes in Schedules 4 and 8 of track access contracts.
Affordability, implementation, monitoring and impacts		
21	Affordability of the HLOSs	Explains our assessment of the affordability of the two governments' high-level output specifications (HLOSs) in relation to the statements of funds available (SoFA).
22	Implementation of our determination	Describes the process for how we will implement the decisions in our determination.

Chapter & Title		Description and purpose
23	Monitoring, enforcement and reporting	Sets out our approach to monitoring in CP5, covering the delivery of Network Rail's outputs and its health and safety and financial performance. Also outlines our approach to monitoring and enforcement.
24	Review of wider impacts	Sets out our assessment of how the overall package in the draft determination, if implemented, would impact on key stakeholder groups beyond Network Rail.
Annexes		
Annex A	Specific consultation questions	Sets out a small number of questions on which we would be particularly interested in stakeholders' views
Annex B	Decision on a freight specific charge for biomass	Describes our consideration of the responses to our February 2013 consultation on whether to apply a freight specific charge to biomass and our further analysis of the issues (see chapter 16 on access charges).
Annex C	Summary of other single till income	Reconciles the total other single till income Network Rail will receive – totalling up the access charges paid by freight and open access operators (set out in chapter 16) with the other single till income in chapter 18.
Annex D	Route-level data	Sets out our assumptions on route-level expenditure requirements and indicative route level revenue requirements.
Annex E	Funding of enhancement projects	Summarises our conclusions on the funding of enhancement projects.
Annex F	Further detail on the effect of the financial framework on the level of access charges	Sets out the level that access charges would be if we had not allowed any payment of network grant and the revenue requirement if we had not used the adjusted weighted average cost of capital approach (i.e. if we had used the cost of capital in the calculation of access charges).
Annex G	Comparison of PR13 to the Rail Value for Money study	Compares our determination to the levels of expenditure and savings projected by the Rail Value for Money study.
Annex H	List of consultancy and independent reporter studies	Lists the reports by our consultants and the independent reporters that have fed into this determination.
Annex I	PR13 stakeholder engagement	Sets out the consultations we have carried out in connection with PR13 since May 2011 and the main stakeholder engagement associated with these.
Annex J	ORR's statutory duties	Lists the statutory duties that we must have regard to when carrying out our functions.
Abbreviations and acronyms		

Consultancy and reporter studies

1.5 A full list of associated reports by consultants and the reporters that we have used to inform our decisions is set out in annex H and the reports themselves (or executive summaries of them) will be placed on our website shortly after publication of this draft determination[28].

Price base

1.6 All values in this document are in 2012-13 prices unless otherwise stated.

Responses to this document

1.7 We welcome comments on any aspect of this document, but there are some specific areas where we have raised specific issues for stakeholders to consider. These are set out in annex A.

1.8 Please send your response in **electronic format** by close of business on **Wednesday 4 September 2013** to:

draft.determination@orr.gsi.gov.uk

Alternatively, if it is not possible to email, please send in hard-copy to:

Valentina Licata
Office of Rail Regulation
One Kemble Street
London
WC2B 4AN
Tel: 020 7282 2171

1.9 Please note, when sending documents to us in electronic format that will be published on our website, we would prefer that you email us your correspondence in Microsoft Word format. This is so that we are able to apply web standards to content on our website. If you do email us a PDF document, where possible please:

(a) create it from the electronic Microsoft Word file (preferably using Adobe Acrobat), as opposed to sending us a scanned copy of your response; and

(b) ensure that the PDF's security method is set to 'no security' in the document properties.

[28] http://www.rail-reg.gov.uk/pr13/publications/consultants-reports.php.

1.10 If you send a written response, you should indicate clearly if you wish all or part of your response to remain confidential to ORR and explain why. Otherwise, we would expect to make it available on our website and potentially to quote from it. Where your response is made in confidence please can you provide a statement summarising it, excluding the confidential information, which can be treated as a non-confidential response. We may also publish the names of respondents in future documents or on our website, unless you indicate that you wish your name to be withheld.

Draft determination conferences

1.11 We will be hosting three conferences to discuss our draft determination. These will be in London (19 June 2013), Glasgow (24 June 2013) and Cardiff (16 July 2013). Please see our website for further details[29].

Process for the remainder of PR13

1.12 Table 1.2 below sets out the remaining high-level milestones for PR13. Please note following our draft and final determinations, Network Rail will produce the draft and final price lists setting out the exact access charges to be paid. This reflects the legal responsibilities for ORR to set the charging framework (and the specific charging rules governing the determination of charges) and for Network Rail as the infrastructure manager to set the access charges based on this framework.

Table 1.2: Timetable for the remainder of PR13

Formal review phase	
12 June 2013	We publish our draft determination.
12 July 2013	Network Rail publishes its draft price lists based on the charging framework set out in our draft determination. This will provide an opportunity for stakeholders to review and comment to Network Rail on the draft price lists (as once approved in December 2013 these are fixed for CP5 unless ORR re-opens the determination).
12 July 2013	We issue our consultation on changes to access contracts and the network licence to implement PR13. This will seek views on the changes we propose to make to track access contracts (mostly in Schedules 4, 7 and 8), station access agreements and network licence provisions to implement our determination.
July 2013	We publish our draft long-term regulatory statement.

[29] http://www.rail-reg.gov.uk/pr13/getInvolved/DD-launch-events.php.

Formal review phase	
4 September 2013	Deadline for responses to our consultations on our draft determination and proposed changes to track access contracts and network licence provisions.
31 October 2013	We publish our final determination, setting out our final decisions on policy issues, expenditure and outputs for CP5.
December 2013	Network Rail publishes its draft delivery plan.
Implementation phase	
20 December 2013	Final access charges (price lists/charge schedules) produced by Network Rail are audited and approved by us.
20 December 2013	Review notices are served which start the formal implementation of PR13. The review notices set out the proposed changes to track and station access contracts and the network licence.
7 February 2014	Network Rail will then have until 7 February 2014 to object to the review notice. If it objects, then we would either issue a revised notice or make a reference to the Competition Commission.
February 2014	If Network Rail does not object, we will issue a 'notice of agreement' shortly after 7 February 2014. This will give beneficiaries to track and station access contracts (e.g. train operators) 28 days within which to give notice that they wish to terminate their access contracts, should they wish to do so.
March 2014	Assuming we issue a notice of agreement in February 2014, we would then expect to issue our review implementation notice in March. This confirms that the periodic review will be implemented on 1 April 2014.
By 31 March 2014	Network Rail publishes its delivery plan for CP5.
1 April 2014	Our PR13 determination is implemented and CP5 begins.

Outstanding work

1.13 We have set out a number of areas in this document where we need to do further work between now and publication of our final determination. This includes work to finalise the payment rates in the Schedule 8 performance regime and a consultation in July 2013 on changes to access contracts and the network licence to implement PR13.

1.14 Alongside this consultation in July 2012, we will issue a draft of the notice that we will issue with our final determination setting out our requirements for Network Rail's delivery plan. In short, this plan will set out how Network Rail will meet its obligations

under the PR13 final determination[30]. The delivery plan is discussed elsewhere in this document and will be key to enabling other industry parties, such as suppliers, to plan for CP5. Network Rail intends to consult on a draft of its delivery plan in December 2013.

Draft long-term regulatory statement

1.15 We will shortly be publishing our long-term regulatory statement. This is intended to set PR13 in the context of a longer term time frame, looking at issues such as longer term financial sustainability and the further alignment of incentives to deliver even greater value for money.

1.16 Following consideration of stakeholder responses, we will publish our final long-term regulatory statement shortly after our final determination in the autumn.

[30] This notice will be issued under condition 1 of Network Rail's network licence, which requires it to prepare a delivery plan in line with such format and structure, and to such standard and level of detail and in accordance with such requirements as we set out in a notice or in guidelines. We must serve any such requirement on Network Rail at least five months before the plan is required, and have consulted it on the content of that notice.

2. Background and context

Key messages in this chapter

- The PR13 process and our decisions have to reflect legal requirements and our statutory duties. In reaching our decisions we have considered all our statutory duties and weighed them as we consider appropriate.
- We established our PR13 objective at the outset of PR13 and we have set out the wider impacts we expect our review to have.
- PR13 consists of a number of 'building block' calculations and decisions, which together make up a package.
- We have made two separate determinations, one for England & Wales and one for Scotland, reflecting the different responsibilities for setting strategy and for funding, although the two are linked as Network Rail is a GB-wide company.
- Our PR13 work has been part of a broader programme of industry reform and will help to push forward further reform.
- Our work on PR13 has involved a substantial amount of consultation and discussion across the industry and more widely, and we have received helpful inputs across all areas of our work.

Introduction

2.1 This chapter provides background to the overall PR13 process, including our objectives, the legal framework and our broader regulatory approach.

Legislative framework

2.2 PR13 follows the statutory procedure for conducting an access charges review set out in Schedule 4A to the Railways Act 1993 (the Act)[31]. Schedule 4A requires the Scottish Ministers (for Scotland) and the Secretary of State for Transport (in respect of England & Wales) to provide us with information about what they want to be achieved by railway activities in Scotland and England & Wales during the control period and the public financial resources that are, or are likely to be, available for the achievement of those activities. They do this by each producing a 'high level output

[31] The Railways Act 1993, available at http://www.legislation.gov.uk/ukpga/1993/43.

specification' (HLOS), setting out what they want the railway to deliver, and a 'statement of funding available' (SoFA), setting out how much public funding they intend to commit to the railways in the period.

2.3 We have to decide if there is enough funding to deliver the outputs sought by the two governments.

2.4 Network Rail has a legal obligation under the Health and Safety at Work etc. Act 1974 to maintain and, where reasonably practicable, improve safety and we must be satisfied that it will be able to meet these obligations given our settlement. Where relevant we have also taken into account the Railways Infrastructure (Access and Management) Regulations 2005[32] (the "Access and Management Regulations") which set out the principles we must follow when we establish the framework in which Network Rail must set access charges.

2.5 We must have regard to our public interest statutory duties which are mostly set out in section 4 of the Act (see annex J). These include duties to have regard to any general guidance given by the Scottish Ministers and Secretary of State (statutory guidance). Our duties are not in any order of priority and it is for us to decide how to weigh these when reaching our decisions. In reaching our decisions, we have considered all of our statutory duties and weighed them as we considered appropriate.

2.6 All our decisions on the overall PR13 settlement are made as part of a 'balanced package' for CP5. So, we may deliver a settlement that is regarded as more challenging in certain areas and relatively less challenging in others, but which should be considered and judged as a whole. We consider that our duties point us to delivering a package that:

(a) is challenging but achievable for Network Rail in terms of efficiency, value for money and deliverability;

(b) works for the long-term as well as the short-term – i.e. is sustainable;

(c) improves health and safety; and

(d) provides appropriate protections in respect of risk.

[32] Available at http://www.legislation.gov.uk/uksi/2005/3049/contents/made.These regulations were amended in 2009 by the Railways Infrastructure (Access and Management)(Amendment) Regulations 2009, available at http://www.legislation.gov.uk/uksi/2009/1122/contents/made.

2.7 The package also balances the short and longer term needs of passengers, freight customers and train operators.

Our PR13 objective

2.8 Following our May 2011 consultation, we confirmed our PR13 objective in May 2012[33]. This is:

> **To protect the interests of customers and taxpayers by:**
> ensuring our determination enables Network Rail and its industry partners to deliver or exceed all the specified outcome and output requirements safely and sustainably at the most efficient levels possible comparable with the best railways in the world by the end of the control period.

2.9 We also recognised the importance of industry reform in helping to deliver our objective, and that PR13 would itself be an important facilitator of industry reform, through:

(a) providing **a clear focus on what matters to passengers, freight customers and taxpayers** – particularly improving value for money;

(b) encouraging a **more disaggregated approach** – increasing transparency and access to information, facilitating greater localism, and supporting more disaggregation in the industry (for example through Network Rail devolution) will allow a more comparative approach to regulation and a better understanding of costs, revenues and subsidy across the industry;

(c) **alignment of incentives** – improving the interfaces between the different players in the industry, for example, by facilitating alliances, efficiency benefit sharing at the route-level and bespoke arrangements where these improve whole industry working, will drive greater value for money for customers and taxpayers; and

(d) **greater contestability** – ensuring that there is more effective use of market mechanisms in the industry will deliver further efficiencies.

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[33] *Setting the financial and incentive framework for Network Rail in CP5*, May 2012, available at http://www.rail-reg.gov.uk/upload/pdf/financial-incentive-framework-cp5.pdf.

2.10 It is important to see the periodic review in the context of our broader ongoing regulation and regulation beyond CP5. Our five strategic goals, which we recently confirmed following consultation, apply across all of ORR's functions including PR13[34]. They are consistent with our PR13 objective, particularly in relation to moving towards a more dynamic and commercially sustainable industry. We will shortly publish our long-term regulatory statement, which will set this out in further detail.

2.11 At the beginning of PR13, we said that if we were successful in achieving our PR13 objective, the outcome should be a railway in CP5 and beyond that:

(a) is safer than ever before, and provides consistently good levels of service reliability across the network;

(b) achieves a better match of the available supply to the demand and more efficient use of available capacity, supporting both the reduction of crowding and greater convenience for passengers, and providing increased flexibility and reliability for freight customers;

(c) has levels of efficiency comparable with the best railways internationally, providing value for money for taxpayers and fare-payers; and

(d) supports the development of a more dynamic economy and contributes to the achievement of national commitments to reduce carbon emissions, through both greater energy efficiency and by encouraging greater use of rail for travel and freight haulage by those that would otherwise use less environmentally friendly transport modes.

2.12 In our final determination, we will set out how we will measure progress against these outcomes.

Progress with PR13

2.13 We began PR13 in May 2011, with a wide ranging consultation on our objective and general approach to PR13. Since then we have carried out a substantial amount of work across all areas covered by the review. This has included extensive stakeholder engagement, including specific consultations on particular policy areas and workshops, which have informed our thinking. Annexes H and I set out the documents

[34] *ORR Business Plan 2013-14*, April 2013, available at http://www.rail-reg.gov.uk/upload/pdf/business-plan-2013-14.pdf.

we have published and the main stakeholder engagement activity we have carried out. We are very grateful for the time people have spent in helping our work, in responding to consultations, attending events, in bilateral discussions and in terms of analytical work.

2.14 In September 2011, Network Rail and its industry partners published the Initial industry plans (IIPs)[35]. These set out what the industry considered should be delivered in CP5 and beyond, and at what cost. After reviewing these, in March 2012 we issued our 'advice to ministers' to the Secretary of State and Scottish Ministers[36]. This, in particular, provided the governments with our view on how much the railway was likely to cost in CP5 and helped to inform their HLOSs and SoFAs.

2.15 Following this, the HLOSs and SoFAs were published in the summer of 2012. Network Rail then developed its strategic business plan (SBP) for CP5 setting out how it would deliver the HLOSs and how much this would cost. The SBP documentation (which included separate plans for England & Wales and Scotland, as well as plans for the devolved routes) was submitted to us in January 2013[37]. We then carried out our detailed assessment of it to inform our determination. To aid our analysis, we sought stakeholders' views on the SBP and received around 170 responses in total[38]. We are grateful to those who took the time to respond.

2.16 Alongside the main SBP documentation, Network Rail and its industry partners published two industry strategic business plans (ISBPs) – one for England & Wales and one for Scotland[39]. These were the culmination of work by the industry to present a more joined-up approach to planning which we were keen to see following PR08. As well as providing valuable wider industry context, the ISBPs set out the industry's

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[35] *Initial industry plan: Proposals for Control Period 5 and beyond*, September 2011, for both England & Wales and Scotland are available at http://www.networkrail.co.uk/iip.aspx.

[36] *Advice to Scottish Ministers on Network Rail's costs and outputs in CP5*, ORR, March 2012, available at http://www.rail-reg.gov.uk/pr13/pdf/pr13-advice-to-ministers-scotland.pdf. Advice to Secretary of State on Network Rail's costs and outputs in CP5, ORR, March 2012, available at http://www.rail-reg.gov.uk/pr13/PDF/pr13-advice-to-ministers-ew.pdf.

[37] Network Rail's strategic business plan documentation, and the industry strategic business plans are available at http://www.networkrail.co.uk/publications/strategic-business-plan-for-cp5/.

[38] See http://www.rail-reg.gov.uk/pr13/Publications/strategic-business-plan.php.

[39] *Industry strategic business plan (England & Wales / Scotland): Industry's response to the high level output specification for CP5*, January 2013, available at http://www.networkrail.co.uk/publications/industry-strategic-business-plan-for-cp5/.

formal response to the HLOSs and how it would respond to the challenges it faces in CP5, including how it will deliver greater value for money.

Regulatory approach

How we determine access charges

2.17 Through the periodic review, we assess the efficient level of expenditure that Network Rail needs to run its business and deliver the regulated outputs. We determine how much revenue it needs, including an allowed return on its regulatory asset base (RAB). The net revenue requirement takes into account other income that Network Rail receives (such as commercial income from property). Net revenue is received from access charges and network grant from government (see paragraph 2.25). It is then for Network Rail to determine the exact charges to be levied on users of its network based the charging framework and rules we set.

2.18 The access charges paid by Network Rail's customers that are within the scope of PR13 include[40]:

(a) track access charges by franchised passenger train operators, open access passenger train operators and charter passenger train operators;

(b) track access charges paid by freight train operators; and

(c) station long term charges paid by the users of franchised stations[41] and the 17 Network Rail 'managed' stations.

Building block methodology

2.19 Our approach to establishing the regulatory framework is based on the standard 'building block' methodology widely used by regulators. The periodic reviews/access charges reviews undertaken for Network Rail (and Railtrack) in 2000, 2003 and 2008 have used this broad approach. Figure 2.1 illustrates the overall regulatory framework and the building block model.

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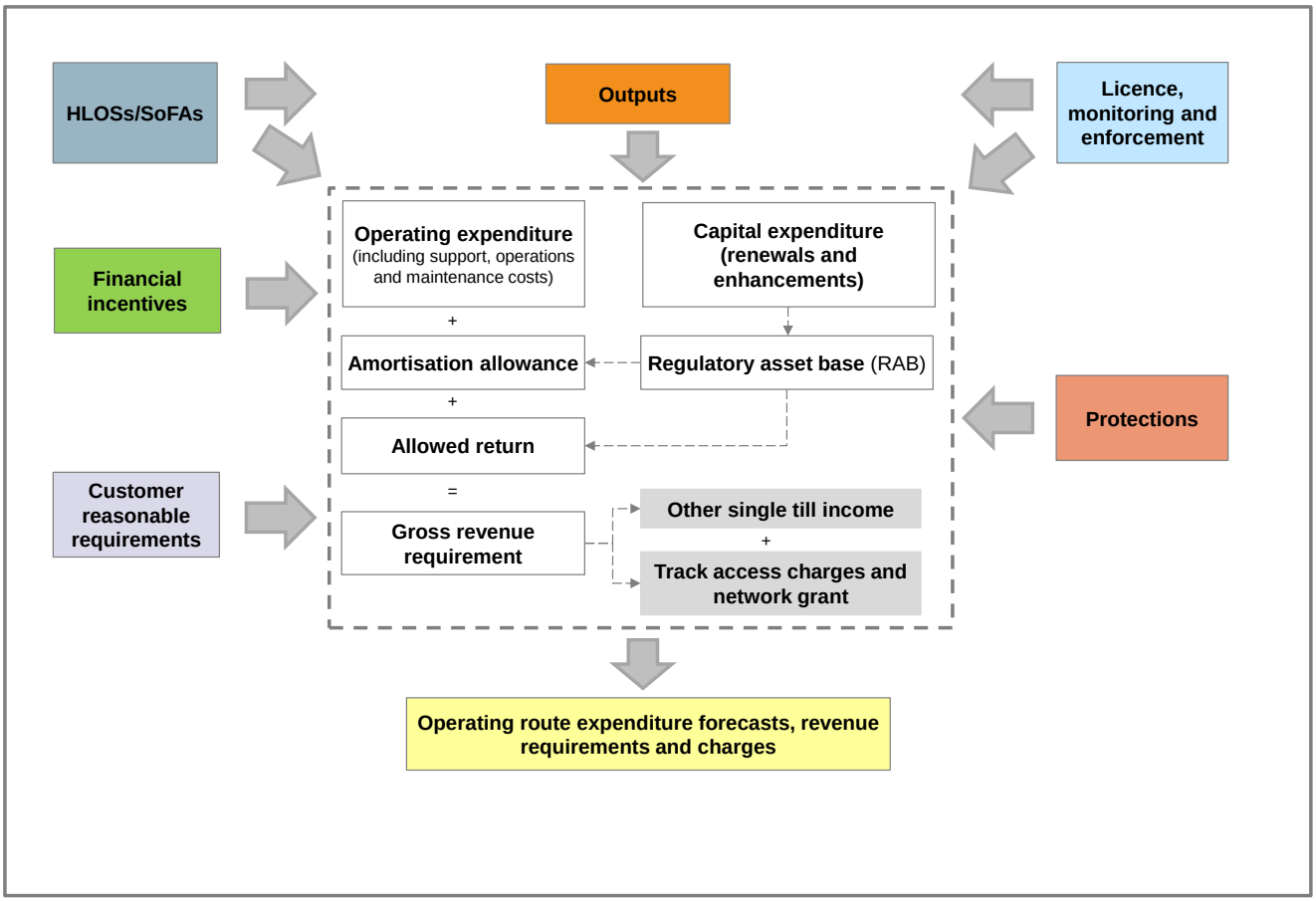
[40] Access charges not within the scope of PR13 are those in access contracts either exempt from regulation (such as the non-stopping Paddington to Heathrow services operated by Heathrow Express) or those that do not contain a contractual reopener permitting a periodic review by ORR of the charges (such as depot access agreements and connection contracts)

[41] The exception to this is those stations managed by the Greater Anglia franchise which are outside the scope of PR13. This follows the transfer of responsibility of maintenance and repair from Network Rail to the franchise during CP4.

Figure 2.1: Overview of the regulatory framework



2.20 The key features of the building block methodology are:

(a) we assess what Network Rail needs to spend on **operating** and **maintaining** the railway for each year of the control period. Network Rail receives income for this on a 'pay-as-you-go' (PAYG) basis. This means that for each pound it needs to spend each year it receives a pound in income;

(b) we assess the capital expenditure on **renewals** and **enhancements** that Network Rail needs to undertake in the control period. This expenditure is added to the RAB in the year in which it is incurred. But the income Network Rail receives is not on a PAYG basis. Instead Network Rail receives an **amortisation** allowance (which covers the depreciation on the assets); and

(c) the **allowed return on the RAB** that we calculate and allow Network Rail to recover through access charges. This therefore covers, amongst other things, the cost of financing the company's **capital expenditure** programme[42].

2.21 Adding up all the income needed by Network Rail to fund these elements produces what we call the '**gross revenue requirement**'.

2.22 In PR13, we are using the 'single till' approach. This means that income (which we call 'other single till income') that we expect Network Rail to earn on activities such as commercial property is deducted from the total costs of the network (i.e. from the gross revenue requirement)[43]. This then leaves us with the '**net revenue requirement**'.

2.23 With the exception of the fixed track access charges, the regulated track and station access charges paid by train operating companies to Network Rail are set to recover particular costs. Most track access charges are set to reflect the costs that vary with traffic, the exception currently being the 'freight-only line' charge, which recovers some additional costs associated with freight traffic. The regulated station charges recover costs for station maintenance, repair and renewal.

2.24 The fixed track access charges, paid only by franchised passenger operators, are set to recover Network Rail's net revenue requirement, i.e. Network Rail's revenue requirement net of other track access charges and other single till income.

2.25 However, the arrangements in CP4 provide for both governments to pay money directly to Network Rail (through 'network grant') to reduce the amount of access charges paid by franchised train operators. We have discussed the pros and cons of

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[42] In PR13, we are calculating the allowed return using the adjusted weighted average cost of capital ('adjusted WACC') approach as explained in detail in chapter 12. In simple terms, this approach recognises that Network Rail's debt is government-backed and it does not pay dividends. Therefore, for CP5 we fund our forecast of Network Rail's efficient financing costs. Also, recognising financial sustainability issues, we provide further revenue to Network Rail by including additional amortisation. In CP5, the return on the RAB will include a payment to government for the financial guarantee Network Rail receives on its debts.

[43] The alternative 'dual till' approach would involve a separate price control for Network Rail's activities in each market that it operates in – effectively treating each of these as a separate business. After consultation, we decided that there was not a strong case for establishing separate 'tills' as we felt it was unlikely to drive improvements in Network Rail's performance. We were also concerned about unnecessary complexity and the potential to distract the industry from maximising the benefits to the industry of Network Rail's commercial activities. Our decision to retain the single till approach is set out in paragraphs 3.46-3.56 of Setting the Financial and Incentive Framework for Network Rail in CP5, May 2012, available at http://www.rail-reg.gov.uk/upload/pdf/financial-incentive-framework-cp5.pdf.

network grant in a number of our PR13 publications[44] and we concluded in December 2012 that we would, in principle, allow network grants to be paid in England & Wales and Scotland[45].

Duration of the control period

2.26 We confirmed in 2012[46] that we intended to retain a five year control period. CP5 will therefore run from 1 April 2014 to 31 March 2019. This followed a consultation[47] which considered the merits of shorter and longer periods in terms of incentives for Network Rail, certainty for customers and funders as well as the reliability of long-term forecasts of revenues. We concluded that five years provided an appropriate balance between planning, uncertainty, incentives and risk.

Disaggregation of price controls within Great Britain

2.27 In PR13 we make a distinct – but linked – set of decisions for Scotland and for England & Wales. This broadly means:

(a) we make a separate determination of the outputs and revenue requirement for each (in the context of the separate HLOSs and SoFAs). This includes separate RABs and notionally separate debt (and financing costs) and corporation tax calculations for the purposes of determining the revenue requirements;

(b) separate determination of access charges (though retaining a GB-wide variable usage charge price list);

(c) separate provisions for dealing with risk and uncertainty (the main difference is that there is a separate 're-opener' for Scotland);

(d) outperformance or underperformance[48] is ultimately retained or borne entirely separately by customers and funders in each area (although not necessarily within the control period); and

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[44] *Periodic review 2013: first consultation*, May 2011, paragraphs 6.42-6.44, available at http://www.rail-reg.gov.uk/pr13/consultations/orr013.php.

[45] *Financial issues for Network Rail in CP5: decisions*, December 2012, available at http://www.rail-reg.gov.uk/pr13/PDF/pr13-financial-issues-decisions-dec12.pdf.

[46] Paragraphs 3.23-3.38 of *Setting the financial and incentive framework for Network Rail in CP5*, May 2012, available at http://www.rail-reg.gov.uk/upload/pdf/financial-incentive-framework-cp5.pdf.

[47] *Periodic review 2013: first consultation – annexes*, paragraphs E.39-E.50, available at http://www.rail-reg.gov.uk/pr13/PDF/PR13-first-consultation-annexes.pdf.

[48] See paragraph 23.33 for an explanation of out- and underperformance.

(e) some separate monitoring and enforcement, e.g. separate financial assessments.

2.28 At present, the Welsh Government is not a principal funder in the same way that the Scottish Ministers and Secretary of State are under the existing statutory process for an access charges review. Therefore, we cannot make a separate set of decisions for Wales as we do for Scotland. We have however engaged with Welsh ministers and officials during PR13 on issues relating to the Welsh rail network and specific matters of concern to them relating to CP5. Should there be further devolution in Wales, we would discuss with the Welsh Government how this should be taken account of in future periodic reviews.

2.29 Whilst we are not carrying out separate determinations for the nine Network Rail routes in England & Wales, we have carried out much of our analysis at the route level. In this document, we are publishing a substantial amount of route level data, partly to explain our analysis, partly because some of it has an impact on the new regional efficiency benefit sharing mechanism, and partly to improve transparency. It is of course for Network Rail, as the regulated company, to manage the delivery by its routes and other business units.

Assumptions about Network Rail

2.30 Network Rail is a company limited by guarantee (CLG) and has members instead of shareholders. These members do not have any significant equity capital[49] and hence are not as strongly incentivised as shareholders would be to drive Network Rail's financial performance. This has an important bearing on the incentives and protections for risk that we put in place for Network Rail. We have assumed in our determination that this CLG status will continue throughout CP5.

2.31 Network Rail currently benefits from the 'financial indemnity mechanism' (FIM). This provides that Network Rail's debt is guaranteed by the UK Government (effectively transferring risk from Network Rail to the UK Government)[50]. Network Rail pays a fee to the UK Government (the 'FIM fee') to reflect the benefit it receives from the FIM.

[49] Each member has a nominal investment of £1.

[50] This guarantee enhances Network Rail's credit, allowing it to raise debt at gilt rates (i.e. UK Government interest rates) plus a relatively small margin.

2.32 In PR08, we provided for Network Rail to begin to raise unsupported debt (i.e. without the benefit of the FIM), which would provide stronger incentives and increase external scrutiny (as unsupported debt holders would want to assure themselves that Network Rail could deliver). However, Network Rail has not raised any unsupported debt in CP4 and we have not assumed that the company will raise unsupported debt in CP5.

Re-openers

2.33 Re-openers are mechanisms that can be used to re-open the price control (i.e. our determination) in certain situations to allow changes to be made to the revenues that Network Rail is allowed to recover. For example, where material events have happened that are beyond reasonable management control or could not have reasonably been foreseen. Hence, through re-openers financial consequences of some elements of the risks that Network Rail faces are transferred to Network Rail's funders and customers.

2.34 We have consulted on the re-openers that should apply in CP5. Our general approach is to retain two of the re-openers from PR08[51]. The first would permit the determination to be re-opened if there are material changes in circumstances for Network Rail or in relevant financial markets. This re-opener applies to events in England & Wales and Scotland. The second applies to Scotland only and permits a re-opening if Network Rail's expenditure in Scotland is forecast to be more than 15% higher than our determination over a forward looking period of three years. In each case we would need to determine whether the terms of the relevant re-opener had been met and, if so, we would then consider whether there is a compelling case for an interim review in light of our statutory duties.

PR13 and the wider context

The Rail Value for Money study

2.35 Around the time that we began PR13, the conclusions of the Rail Value for Money (RVfM) study, that we commissioned jointly with DfT, were published[52]. This identified a number of barriers to efficiency in the industry, which if addressed could lead to

[51] The precise wording of the re-openers will be consulted on in our July 2013 consultation on the changes required to access contracts and the network licence to implement PR13.

[52] *Realising the Potential of GB Rail: Final Independent Report of the Rail Value for Money Study*, May 2011, available at http://www.rail-reg.gov.uk/server/show/ConWebDoc.10401

savings of between £2.5bn (the 'low' end) and £3.5bn (the 'high' end) by 2018-19 (in 2008-09 prices). Of these potential savings, between £1.8bn and £2.8bn were identified as being within the control of Network Rail to achieve, and between £0.6bn and £1.2bn for the rest of the industry (2008-09 prices).

2.36 The issues that needed to be addressed to deliver these efficiencies included: sub-optimal interfaces between industry parties and processes; poorly aligned incentives; the way in which major players in the industry had operated – for example, Network Rail's centralised approach and insufficient focus on the needs of its customers; the legal and contractual frameworks; supply chain management; insufficient emphasis on whole-system approaches; and the relationships and culture within the industry[53].

2.37 The RVfM study was clear that to achieve the greater efficiencies, it would be necessary for the whole industry to play its part. This included ORR and the governments who would each need to facilitate the changes necessary to enable the industry to operate more efficiently.

2.38 The RVfM study informed our approach to PR13. In our first consultation, while we noted that PR13 could not address all the challenges faced by the industry, we were clear that it would provide a vehicle to achieve a number of improvements to deliver a better railway. We emphasised the need for greater alignment of incentives and the right approach to risk and reward, along with more joined-up industry planning and decision making across the supply chain.

Progress following the RVfM study

2.39 Since then, in parallel with PR13, the industry has acted on the RVfM study recommendations. In late 2011, the cross-industry Rail Delivery Group (RDG) was established, bringing together the owners of the passenger and freight train operating companies and Network Rail to provide leadership for the rail industry and drive forward reform. RDG is coordinating a number of workstreams through its working groups set up to find more innovative, efficient and joined-up ways of working. Alliances between train operators and Network Rail have been developed on a case-

[53] Pages 8-10, *Realising the Potential of GB Rail: Report of the Rail Value for Money Study – Summary Report*, May 2011, available at http://www.rail-reg.gov.uk/server/show/ConWebDoc.10401

by-case basis, providing a framework for greater alignment between industry parties and improved decision making.

2.40 Overseen by RDG, the industry has produced the ISBPs for CP5 and the Rail Technical Strategy. These were developed respectively by the cross-industry Planning Oversight Group and the Technical Strategy Leadership Group. These set out the industry's overall approach for CP5, including on crosscutting issues such as the roll-out of new technology, the need for innovation and further integration of the different elements of the supply chain, as well as how the industry will respond to climate change.

2.41 DfT has announced a new approach to franchising and a new franchising timetable, with 12 franchises scheduled to be let during CP5[54]. Transport Scotland has confirmed its approach to its next round of franchising, with two separate ScotRail and Caledonian Sleeper franchises to be let in the first year of CP5.

2.42 Network Rail itself has taken significant steps to reform, most notably devolving responsibility from its centre to its ten operating routes. This was a fundamental and welcome change which provides the foundation for further reform. It enables closer working relationships between each route and its customers, more local decision making and also scope for better regulation.

The importance of continuing industry reform

2.43 Demand for rail is forecast to continue growing. This is good news for the industry. However, the challenge will be for it to provide the extra capacity required to accommodate this demand whilst at the same time driving down costs and providing a better service, both to give customers the value for money that they expect and to put the industry on to a more financially sustainable footing.

2.44 Given Network Rail's central role in the industry, its continuing transformation will be essential to securing this outcome. In CP5, we want to see it build on the changes it has already made to forge more responsive relationships with its train operator customers. This will require a more commercial and collaborative approach to its

[54] *Rail franchise schedule*, DfT, March 2013, available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/170565/rail-franchise-schedule.pdf.

engagement with its industry partners to unlock whole industry efficiency and better performance.

2.45 An example of where this will be crucial will be the CP5 enhancements programme. By working more closely with its customers and suppliers on the specification of enhancement projects, the costs of delivering improvements to the network should be minimised. At the same time, it will help ensure that ultimately those enhancements deliver infrastructure over which Network Rail's customers wish to operate more services, increasing Network Rail's income and providing a better service to passengers and freight customers.

2.46 For this to happen, it is vital that Network Rail and its partners have effective and aligned incentives – to encourage them to work together to reduce costs and to make the most of the capacity available. Improving the cost reflectivity of access charges paid by train operators to Network Rail is particularly important in this respect. Where the costs incurred in delivering a service are reflected in the charges paid, the price signals provide information that leads to more efficient behaviour. This should lead to more efficient usage – e.g. train operators will be encouraged to reduce the wear and tear their trains cause to the network.

2.47 Further disaggregation and transparency will also drive better outcomes, leading to decision making closer to the customer.

2.48 Greater transparency in respect of the operational and financial performance of Network Rail's devolved routes will provide a reputational incentive to improve. It will also enable a greater understanding of performance, costs and subsidy, empowering Network Rail's customers to hold it to account. This in turn should facilitate greater local involvement in the funding and specification of the railway – such as through devolution of franchising, and decision making more attuned to the needs of customers.

2.49 Further disaggregation will also allow us to make greater use of comparative techniques in the way we regulate, enabling us to compare the different business units within Network Rail and opening up a wider range of comparators beyond this.

Beyond PR13

2.50 We have been clear that CP5 will act as a stepping stone – a period during which Network Rail, with its industry partners, follow-up recent reforms with further

transformation to lay the foundations of a more 'normal' and sustainable industry in CP6 and beyond. As well as working with the industry to implement our PR13 determination, we will work with Network Rail, RDG and others to support and facilitate further reform in CP5.

2.51 In PR13, we have taken account of the limited extent to which the incentives we set through a periodic review are felt by franchised passenger operators because of the provisions protecting them from regulatory changes which are set out in their franchise agreements with DfT and Transport Scotland. Whilst we understand the rationale for this protection, ideally franchised passenger operators would be more exposed to changes in charges made during a periodic review – in the same way that freight and open access passenger operators are. The decision to relax this protection is for the franchising authorities to make and we have engaged with DfT and Transport Scotland to discuss how this could be brought about.

2.52 During CP5, we will be taking forward with RDG a more fundamental review of the structure of charges which will inform the next periodic review. This will take account of reforms in the industry such as route-level disaggregation.

2.53 The ISBPs developed for CP5 were underpinned by the route utilisation strategies that have been developed by the industry over recent years. We will support Network Rail and its industry partners in building on this progress with the next generation of route strategies and the integration of this with the cross-industry work on technical strategy.

2.54 We will also shortly be consulting on our long-term regulatory statement which considers how the industry may evolve beyond CP5 and our role.

Relationship between PR13 and High Speed 2

2.55 The UK Government has committed to the staged construction of a high-speed rail line (HS2). The first stage (London to Birmingham) is expected to open in 2026. Further stages have been proposed beyond this to Manchester and Leeds (which would open during the 2030s), and to Scotland. Construction of the first stage is expected to start during CP5.

2.56 Our draft determination does not specify any outputs in respect of the construction of HS2. However, it does specify a development fund for enhancements in CP6 that is intended to include, in part, necessary development work for the linkage of the

existing network to HS2. We would expect Network Rail in CP5 to ensure that, when renewing and enhancing its network, it takes account of potential connections and interfaces with HS2 to ensure that costs in the longer term are minimised.

3. Output framework

Key messages in this chapter

- The output framework consists of outputs which Network Rail must deliver for the money it receives, indicators which we use for monitoring purposes and 'enablers' which assess the capability of the company not just in the short term, but over the longer term.
- We have set challenging but achievable outputs in areas that matter most to passenger and freight customers.
- There will be a new output to reduce risk at level crossings and more level crossings will be closed.
- We are significantly strengthening the requirements on Network Rail to improve the management of its assets. There will be specific quality standards for the company's knowledge of its assets and requirements to improve its asset management capability.
- A major programme of improvement works will transform travel in and between urban areas, with existing major projects such as Crossrail, the Edinburgh to Glasgow improvement programme and Thameslink completed and the completion of new projects such as the electrification of the Welsh Valley lines (covered in detail in chapter 9).
- There will be an output to achieve 92.5% of passenger trains on time by 2019, despite growing passenger and freight demand. The focus will be on improving services in the worst performing areas, with a new output for all franchised train operating companies in England & Wales to have at least nine out of ten trains on time by 2019.
- There will be a new measure of freight train service performance, the freight delivery metric, with 92.5% of freight trains to be on time.
- Disruption to passengers and freight will be lower at the end of the control period than it is today. Because of the large programme of improvement works on the network, there may be increased local and short-term disruption, but this will be kept to a minimum.

Key messages in this chapter (continued)

- We will give the industry flexibility to set performance improvements where possible, within our overall framework. This should strike the right balance between delivering growth and improving services.
- We expect Network Rail to set an ambitious environmental agenda, with stretching carbon reduction trajectories and a greater focus on making assets resilient to climate change and extreme weather.
- There will be new measures which will help us assess how well Network Rail is improving its customer service, its management of large investment programmes and its 'system operator' – how well it runs the infrastructure – capability.
- We are introducing a change control mechanism to potentially adjust Network Rail's passenger train service performance outputs if franchises are let with train service performance requirements that are materially inconsistent with Network Rail's outputs.
- This determination will considerably improve transparency by requiring more, and better quality information, to be made publicly available in an accessible format.

Structure of this chapter

3.1 This chapter is structured as follows:

(a) the **introduction** explains the choices involved in setting outputs, the wider framework, and the process for setting the framework in CP5. It then briefly summarises the main outputs we have set;

(b) the **HLOS** section very briefly summarises the HLOSs;

(c) the **outputs consultation** section explains the rationale behind the output framework we consulted on in August 2012, and differences to the CP4 output framework;

(d) the **responses to our consultation** section summarises the feedback we received on our outputs consultation;

(e) the **Network Rail's proposals** section outlines how the output framework put forward in Network Rail's SBP differed to that in our consultation;

(f) the **our decisions** sections confirms the outputs, indicators and enablers we are setting for CP5; and

(g) the **next steps** section explains how the process concludes.

Introduction

Choices around outputs

3.2 We needed to decide what Network Rail should deliver – what are the company's outputs in return for the money it receives? Currently these outputs are set in terms of areas such as train service reliability (the percentage of trains arriving on time), the delivery of enhancement projects and reducing disruption to passengers from engineering work.

3.3 Having decided what areas we should set outputs for, we then needed to decide the level at which the output should be set and the time period for which the output should apply (e.g. should there be a different requirement for each year?). There is a further choice about the level of disaggregation – do we set outputs for, say, the whole of England & Wales, or should we also set outputs at the level of the route or train operator. Finally, we needed to decide whether there should be a change control process to allow outputs to be amended during CP5 in certain circumstances.

3.4 We wanted to set outputs in the areas that matter most to passengers and freight customers. But we needed to take into account wider factors. Just setting more and more outputs is not necessarily a good thing as it may constrain Network Rail so far that it increases the risk the company faces and potentially increases costs. We also wanted to give Network Rail flexibility to work with the industry to deliver in a way which maximises value for money.

The output framework

3.5 In this control period, CP4, we have defined outputs but we have also defined indicators which we use for specific monitoring purposes. For example, we have asset condition indicators to make sure that Network Rail is not meeting its outputs by storing up problems for the future by 'sweating the assets'.

3.6 In addition, during the course of CP4, we defined 'enablers' which assess the company's capability to deliver future improvements (i.e. not just within, but beyond, the current control period) in outputs and / or efficiency.

3.7 It is this combination of outputs, indicators and enablers that we call the output framework.

3.8 The crucial difference in terms of regulation between outputs and enablers / indicators is that if Network Rail fails to deliver the outputs we would consider whether this amounts to a licence breach and hence we may take enforcement action against the company (hence outputs are often referred to as 'regulated outputs'). A failure to deliver either an enabler or an indicator would not in itself be considered as a potential licence breach. However, either may indicate trends which raise concern about Network Rail's likely future compliance with an output that we may want to take licence enforcement action to address.

The process for setting the output framework

3.9 The process for setting the output framework started with the advice we provided to the Scottish Ministers and the Secretary of State in March 2012. Following this:

(a) in June/July 2012, the HLOSs were published;

(b) in August 2012, we published our outputs consultation;

(c) in January 2013, Network Rail published its SBP;

(d) in June 2013, this draft determination was published;

(e) in October 2013, we publish our final determination;

(f) in December 2013, Network Rail publishes its draft delivery plan; and

(g) in March 2014, Network Rail publishes its final delivery plan.

Brief summary of the CP5 outputs

3.10 Because this is an extended process, in some ways it is easier to briefly describe our decisions so far, and then describe each stage for getting to this point. For CP5 we have again developed a framework based on outputs, indicators and enablers. Our decisions to date are summarised in Tables 3.1 and 3.2 (the full output framework is shown in Table 3.11).

3.11 The rest of this chapter describes each stage of the process for setting outputs, leading to more detail on our decisions, then describes how the process concludes.

3.12 All national outputs include franchised and open access operators.

Table 3.1: Summary of our decisions on CP5 outputs

Area	Outputs
Train service reliability	• PPM[55] for England & Wales (annual[56] and CP5 exit of 92.5%), Scotland (annual 92% and CP5 exit of 92.5%) and franchised TOCs in England & Wales (rolling annual output JPIP and no TOC to exit CP5 below 90%) • CaSL[57] (England & Wales annual and CP5 exit of 2.2%) • Freight Delivery Metric[58] (National annual 92.5%)
Enhancements	• Enhancement projects to be delivered. Scheme delivery milestones (set in an enhancements delivery plan). Milestones for delivery of projects in ring-fenced funds. • Development milestones for early stage projects
Health and safety	• Network Rail required to deliver a plan to maximise the reduction in risks of accidents at level crossings, using £67m ring-fenced fund [59]
Network availability[60]	• PDI-P (National CP5 exit of 0.539) • PDI-F (National CP5 exit of 0.593)
Network capability	• Base requirement at start of CP5 in terms of track mileage & layout, line speed, gauge, route availability, electrification type[61]
Stations	• Station Stewardship Measure (SSM) by station category, and Scotland (annual)[62]
Asset management[63]	• Asset management excellence model (AMEM) capability for each core group at National level • Asset data quality for each asset type at National level • Milestones for ORBIS (Offering Rail Better Information Services)

[55] Public performance measure (PPM) is the proportion of trains that arrive at their final destination on time. A train is defined as on time if it arrives within five minutes of the planned destination arrival time for London & South East and regional services; or ten minutes for long-distance services.

[56] See Table 3.4 for annual PPM outputs.

[57] CaSL (Cancellations and Significant Lateness) is a combined measure of punctuality and reliability. It is a percentage measure of scheduled passenger trains which are either cancelled (including those cancelled en route) or arrive at their scheduled destination 30 or more minutes late.

[58] Freight Delivery Metric (FDM) measures the percentage of freight trains arriving at their destination within 15 minutes of scheduled time. It only covers delay caused by Network Rail.

[59] Note safety is not a devolved responsibility so all safety related outputs, indicators and enablers apply to England, Wales and Scotland.

[60] The Possession disruption index – passenger (PDI-P) and Possession disruption index – freight (PDI-F) measure the level of disruption caused by possessions over a period of time.

[61] This output provides for a minimum level for the whole network. The capability of some parts of the network will improve during CP5 as a result of the enhancement programme.

[62] See Table 3.5 for outputs.

[63] See 'Our decisions on asset management' section for outputs.

Table 3.2: CP5 output framework – summary of indicators and enablers

Area	Indicators	Enablers (these support all output areas)
Train service reliability	• PPM: sector and service group • Right-time performance[64]: England & Wales, Scotland, sector, JPIP and service group • Average lateness[65]: England & Wales, Scotland, sector and JPIP • CaSL: sector and service group • Delay minutes, split by category (including Network Rail on TOC, TOC on self and TOC on TOC): for National, England & Wales, Scotland, sector, Network Rail route and JPIP • Freight delay minutes, national and strategic freight corridor • Scotland KPI package[66]	• Safety management maturity (Railway Management Maturity Model – RM3) • System operator capability • Programme management capability • Customer service maturity
Enhancements	• Enhancement fund KPIs (e.g. average scheme benefit cost ratios) • Improved governance processes for HLOS funds • Project activities and milestones	
Depots	• Light Maintenance Depot Stewardship Measure: England & Wales, Scotland and National	
Asset management	• Asset condition for robustness and sustainability at National and route level • AMEM lite capability by core group at route level • Renewal and maintenance volumes by asset type and spend at National and route level	
Environment	• Scope 1[67] and 2[68] traction and non-traction carbon dioxide emissions: England & Wales and Scotland • Carbon intensity: England & Wales and Scotland • Carbon embedded in new infrastructure • Sustainable development KPIs	
Other	• Passenger satisfaction • Journey time • Cross-border service availability	

[64] Right-time performance measures the percentage of trains arriving early or within 59 seconds of schedule.

[65] The average lateness of trains at the stops along its route.

[66] See section 3.61.

[67] Scope 1 carbon dioxide emissions result from activities directly under the control of Network Rail.

[68] Scope 2 carbon dioxide emissions are those resulting from energy purchased by Network Rail. These emissions are as a result of Network Rail's activities, but not directly under its control.

The HLOSs

3.13 The HLOSs[69] are a 'given' and where appropriate their requirements have been included as outputs in this determination.

3.14 The Secretary of State's HLOS included a requirement for PPM in England & Wales to reach 92.5% (MAA[70]) by the end of CP5, funding for a number of enhancement projects to be delivered, and provided funding for ring-fenced funds to deliver certain strategic objectives, such as station improvements. There was also the option for PPM to be higher, and CaSL lower: "if the ORR determines this is value for money and can be affordably achieved without compromising delivery of other HLOS requirements".

3.15 The Scottish Ministers HLOS specified an end CP5 92.5% PPM (MAA) requirement (and annual requirements of 92%), enhancement schemes to be delivered and ring-fenced funds e.g. to close level crossings. There was a requirement to set up a process to make journey time improvements and keep at least one cross-border route available at all times.

Outputs consultation

3.16 In August 2012 we consulted[71] on the proposed CP5 output framework. We included the requirements of the HLOSs. In some areas we described how we would set the HLOS outputs in more detail e.g. set enhancement obligations in the form of detailed enhancements milestones, as in CP4, to give clarity to what will be delivered and when, and maintain the CP4 change control mechanism.

3.17 But we also said that we wanted to go beyond the HLOSs and;

(a) strengthen the focus on asset management, to emphasise the importance of Network Rail becoming an excellent asset manager. We proposed that we set some asset management measures as outputs;

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[69] *High Level Output Specification 2012,* Department for Transport, July 2012 is available at https://www.gov.uk/government/publications/high-level-output-specification-2012 and the *High Level Output Specification 2012*, Transport for Scotland, June 2012 is available at http://www.transportscotland.gov.uk/strategy-and-research/publications-and-consultations/j232012-00.htm.

[70] Moving annual average (MAA) – the average of the last 13 four-week time periods.

[71] *Network Rail's output framework for 2014-19*, Office of Rail Regulation, August 2012, available at http://www.rail-reg.gov.uk/pr13/consultations/outputs.php.

(b) replace our CP4 freight delay minutes output with 'freight CaSL', to measure success against an output more closely linked to freight operator priorities (freight performance was not specified in the HLOSs);

(c) focus outputs on train operators / services rather than Network Rail routes, setting PPM and CaSL outputs by TOC, but monitor indicators of Network Rail's performance at route level;

(d) continue and extend the use of enabler measures of Network Rail's capability to deliver, to monitor progress of Network Rail's capability;

(e) establish new environmental indicators, to define Network Rail's role in sustainable development; and

(f) introduce and monitor a 'whole industry scorecard' to give context to our assessments of delivery (see chapter 23).

3.18 The main differences between the proposed CP5 output framework, and our existing CP4 framework, are that for CP4:

(a) performance outputs were set at sector level;

(b) Network Rail caused delay minutes (to passenger and freight operators) were set as an output in CP4 but would not be in CP5; and

(c) we did not set any asset management outputs in CP4, although we did specify asset management maturity scores as an enabler during CP4.

3.19 We also published the findings of a review[72] by the independent reporter Arup, of the effectiveness of the CP4 output framework. We have explained how Arup's findings are taken into account, in our determination of the output framework, in each 'our decisions' section of this chapter.

3.20 Table 3.3 shows the proposed CP5 output framework in our consultation.

[72] *CP4 regulated outputs*, Arup, August 2012, is available at http://www.rail-reg.gov.uk/pr13/consultations/outputs.php.

Table 3.3: Outputs consultation: proposed CP5 output framework

Area	Outputs	Indicators	Enablers (these support all output areas)
Train service reliability	Passenger - PPM: England & Wales, Scotland - PPM by operator - CaSL: England & Wales, Scotland - CaSL by operator Freight - Freight CaSL	Right-time performance (by operator) Average lateness (by operator/service group) Network Rail caused delay (by route) Suite of cause of delay indicators	Asset management excellence, by route Safety management maturity New system operator capability enabler, which could cover: Process of assembling, validating and publishing the timetable Possessions planning Understanding / measuring capacity availability and utilisation Network planning Network change Possible further measures including customer service maturity
Enhancements	Enhancement scheme delivery milestones (set out in an enhancements delivery plan)	Enhancement fund KPIs (e.g. average scheme benefit cost ratios) Improved governance processes for HLOS funds	
Safety	Level crossing risk reduction plan delivery milestones		
Network availability (reducing disruption from engineering works)	PDI-P (or alternative measure proposed by the industry) PDI-F (or alternative measure proposed by the industry)	Possession indicator report metrics	
Network capability	Base requirement at start of CP5 in terms of track mileage & layout, line speed, gauge, route availability, electrification type		
Stations	Station condition measure (existing SSM measure migrating to new measure in CP5)		
Depots		Average condition score	

Area	Outputs	Indicators	Enablers (these support all output areas)
Asset management	Asset management excellence capability Asset data quality Milestones for ORBIS / operating strategy project	New indicators for asset policy delivery, and asset performance / condition monitoring More transparent condition reporting	
Environment		Indicators demonstrating reductions in carbon dioxide emissions associated with OMRE[73]sector Carbon and energy efficiency KPIs Carbon embedded in new infrastructure Sustainable development KPIs (to be determined)	
Other		Journey time indicator Station accessibility indicator Indicators of improvements in passenger information Possible supply chain engagement indicator Possible levels of innovation indicator	

Responses to our consultation

3.21 We received responses from a wide range of passenger / freight representatives, passenger / freight operators, funders, suppliers and Network Rail. Very broadly, consultees:

(a) supported our proposed output framework structure;

[73] OMRE refers to operating, maintenance, renewals and enhancement activity.

(b) believed the CP4 approach to enhancements delivery plan milestone obligations and change control worked well, and supported its continuation into CP5;

(c) welcomed the introduction of a whole industry scorecard to set Network Rail's performance in a wider context;

(d) agreed obligations should be operator / service-focused (rather than Network Rail route focused) where possible, although ORR should still monitor indicators at route level;

(e) supported new indicators such as right-time performance and station accessibility;

(f) believed a journey time indicator is a good idea but hard to define; and

(g) welcomed our drive towards a more transparent output framework and monitoring process.

3.22 There was disagreement on:

(a) the status of asset management outputs – in particular, while Network Rail emphasised the importance of improved asset management, it did not believe it should be subject to regulated outputs in this area;

(b) the appropriateness and practicality of a trade-off / change control mechanism, in particular in relation to HLOS outputs; and

(c) the extent of regulated output obligations set, as opposed to indicators and enablers.

Network Rail's proposals

3.23 Network Rail's SBP proposed its own framework. The main differences between Network Rail's proposal and the output framework in our consultation were:

(a) no asset management outputs – Network Rail believes we should not set outputs for asset management measures, as this would be a move towards input-based regulation;

(b) performance indicators – Network Rail did not commit to reporting right time performance (in England & Wales) or average lateness;

(c) no journey time indicators – Network Rail's view is this would be too complex to create and implement in a meaningful fashion;

(d) no station accessibility measure – Network Rail considers there are existing legal commitments in this area and an indicator could therefore lead to confusion over accountability;

(e) passenger information – Network Rail sees this as best measured through the National Passenger Survey and therefore should not be a metric in the output framework;

(f) supply chain engagement/innovation – Network Rail believes there are existing metrics and is working on developing new metrics that can measure progress outside the output framework; and

(g) no safety management maturity enabler – Network Rail does not believe RM3 is an appropriate enabler as it sees this as a move towards input-based regulation.

Our decisions on outputs

3.24 The following sections confirm the decisions we have taken in each output area. In each section we have explained the decision we needed to make, analysis we undertook and the output, indicator or enabler we are setting. Our decisions are structured around the following areas:

(a) train service reliability (passenger and freight performance);

(b) enhancements (investment projects);

(c) health and safety;

(d) network availability (disruption from possessions[74]);

(e) network capability (speed and type of trains that can operate on the network);

(f) stations and depots;

(g) asset management;

(h) environment; and

[74] Network Rail needs to restrict access to its network to carry out many of its maintenance and renewals activities. These restrictions of access are referred to as possessions.

(i) other (system operator capability, programme management capability, customer service maturity, passenger satisfaction, journey time and cross-border route availability).

Our decisions on train service reliability

3.25 We have reviewed Network Rail's SBP and commissioned analysis from the independent reporter Nichols[75].

3.26 This section is structured as follows:

(a) background on CP4 performance;

(b) whether Network Rail's SBP contains sufficient evidence that the England & Wales HLOS PPM and CaSL requirements will be met. As Network Rail presented much of its analysis on a 'probability' basis, i.e. a percentage likelihood that it would hit the HLOS requirement, we have reviewed this to understand whether Network Rail's plans will deliver the HLOS requirements. If it appeared that they would not, we would require the company to do more;

(c) whether there is an affordable, value for money case for increasing England & Wales PPM and CaSL outputs, to answer the question raised in the Secretary of State's HLOS about whether the requirement should be tightened;

(d) whether the end CP5 England & Wales HLOS PPM and CaSL outputs should be supplemented with additional annual outputs and the proposed level of these outputs. As related issues it considers whether there should also be sector level outputs or other outputs such as delay minutes;

(e) if TOC level outputs for PPM and CaSL (in England & Wales) should be set and, if so, how that should be done. In particular, whether a process should be introduced whereby the industry sets TOC level outputs annually, subject to our oversight, and whether each TOC level output should have to reach a minimum level;

(f) what indicators we should specify, and at what level;

(g) whether Network Rail's SBP contains sufficient evidence that the Scotland HLOS PPM requirements will be met; and

[75] *HLOS Performance and Reliability Analysis and Targets review*, Nichols, April 2013, available at http://www.rail-reg.gov.uk/pr13/publications/consultants-reports.php.

(h) whether freight outputs based on FDM should be established, whether these should be annual outputs and the level of this output.

Background on CP4

3.27 Network Rail has had a number of problems delivering its PPM (MAA) outputs in CP4 and we have taken licence enforcement action. As a result of our concerns regarding performance in the long distance sector[76] we carried out an investigation and required Network Rail to develop a performance recovery plan. We accepted Network Rail's plan for 2012-13 but found a likely future licence breach for 2013-14. We made an order containing a reasonable sum which will require Network Rail to pay £1.5m for every 0.1 of a percentage point that performance falls short of the regulated PPM (MAA) output.

3.28 Network Rail proactively produced recovery plans for the London & South East[77] and regional[78] sectors when it became clear that its outputs might not be achieved.

3.29 In Scotland performance was poor in the early part of the control period but good cooperation and strong management by Network Rail and First ScotRail leave it in a strong position to be ahead of its PPM (MAA) output at the end of CP4.

3.30 Freight performance was poor in the early part of CP4. We established the Freight Recovery Board in January 2012. This generated effective, collaborative working across the industry stimulating an improvement in performance.

England & Wales: will the PPM and CaSL outputs be met?

3.31 Network Rail presented its forecasts in terms of probability distributions – it calculated how likely it was that it would deliver different levels of PPM and CaSL.

3.32 Network Rail reviewed all the plans from its operating routes, summed their impacts and calculated that there was a 25% chance that it would hit the HLOS requirements.

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[76] The long distance sector is the industry sector of operators operating long distance services; Cross Country, East Coast Trains, East Midlands Trains, First Great Western, Greater Anglia, and Trans Pennine Express and Virgin Trains. Train operating companies can operate services in more than one sector. For example, First Great Western operate services in each of the three sectors; London & South East, long distance and regional.

[77] The London and South East sector is the industry sector comprising of services operated by the following operators; South Eastern Railway, Southern Railway, South West Trains, First Great Western, Chiltern, London Midland, First Capital Connect, Greater Anglia, C2C and London Overground.

[78] The regional sector is the industry sector comprising of services operated by the following operators; Arriva Trains Wales, First Great Western, London Midland, Northern, East Midlands Trains, and Merseyrail.

However, it then added in a number of national and TOC initiatives that would improve performance and this increased the level of confidence to 75%.

3.33 Nichols found much of the analysis to be reasonable, but considered that Network Rail had underestimated the performance benefit from implementation of the Traffic Management System (TMS), enhancements, CP4 and CP5 national initiatives and fleet reliability. Nichols also considered that Network Rail had potentially over-estimated the negative impact of traffic growth on performance.

3.34 In its SBP, Network Rail assumed it will achieve its CP4 exit outputs for PPM and CaSL. However, both Network Rail's and Nichols's latest assessment indicates that these are not likely to be met. Nichols also considered that Network Rail had under-estimated the negative impact of severe weather on performance.

3.35 Taking all this into account we have concluded that there is around a 45% confidence of Network Rail achieving the HLOS PPM output and around a 50% confidence of Network Rail achieving the HLOS CaSL output based on Network Rail's route and national plans.

3.36 At this stage of the process, with nearly a year of CP4 to run, we see this as challenging but achievable and believe that it represents a reasonable degree of confidence. We have therefore decided to set a CP5 exit output of 92.5% for PPM (MAA) and 2.2% for CaSL (MAA) as outputs.

England & Wales: should the HLOS PPM and CaSL outputs be increased?

3.37 The England & Wales HLOS has an option for the end CP5 national PPM (MAA) output of 92.5% to be increased and CaSL (MAA) output of 2.2% to be reduced (unlike PPM, a lower CaSL rate is better) if this demonstrated value for money, was affordable and did not compromise delivery of other HLOS requirements.

3.38 Network Rail did not explicitly consider this as it felt the initial industry plan (published previously) was clear it would not be value for money. Nichols carried out an assessment of the potential impact of setting a higher national level output for PPM or CaSL, in terms of value for money, affordability and trade-off with other outputs, but noted the difficulty of calculating this at the national level. Its assessment of value for money and affordability showed that the cost of driving further performance improvement was increasingly difficult as performance itself improved. Therefore, it is likely that the case for targeted investments will be strongest on those routes or

service groups which are the worst performing services or those with the highest economic impact.

3.39 Taking all this into account we have concluded that the PPM and CaSL outputs for England & Wales should not be increased beyond those specified in the HLOS.

Additional England & Wales performance outputs

3.40 The following section reviews whether we should set further performance outputs in this determination.

3.41 The first issue is whether to supplement the end CP5 PPM and CaSL outputs with annual outputs. In our outputs consultation we said it is important to set outputs year-by-year, to drive progress towards the end CP5 output and to ensure passengers' ongoing interests are not compromised in the delivery of the end CP5 output. On balance we have decided that it is important that annual performance is broadly maintained during CP5 hence we have set annual outputs. We also see these annual outputs as an important 'anchor' for TOC level outputs.

3.42 Network Rail's phasing to deliver HLOS assumes a CP4 exit level of 92.5% for PPM (MAA) and 2.2% for CaSL (MAA). Based on our own analysis and Network Rail's latest forecasts, the entry point into CP5 is likely to be lower than stated in the SBP.

3.43 Therefore, we have decided to set the annual outputs for PPM and CaSL in Table 3.4 below, which reflect the lower CP5 entry point.

Table 3.4: Our decision on CP5 annual outputs for PPM and CaSL

	2014-15	2015-16	2016-17	2017-18	2018-19
CP5 PPM (MAA) England & Wales outputs	92.2	92.3	92.4	92.4	92.5
CP5 CaSL (MAA) England & Wales outputs	2.2	2.2	2.2	2.2	2.2

3.44 We then considered whether we should continue with the PPM and CaSL outputs by sector (long distance, regional, London & South East) that are in place for CP4. In our outputs consultation we pointed out that sector outputs put a greater focus on certain types of services, but they also add another layer of outputs which could be seen as unnecessary. Network Rail supports a move away from sector level outputs, although some operators pointed out that they are useful for comparative purposes.

3.45 There are benefits to aggregating services to sector level; for example holding similar operators to account and providing useful analysis of national performance. However, the approach has created some issues, for example during CP4 we implemented performance investigations at a sector level, despite the underperformance being driven by only one or two operators in that sector.

3.46 On balance we have decided not to maintain the sector level outputs. However, performance at a sector level will be reported as an 'indicator' for CP5 as we see benefits of being able to group operators together to provide an interim level between train operators performance and national performance.

3.47 In CP4 we also set outputs for Network Rail caused delay minutes for England & Wales, Scotland and freight. In our consultation we said we will not set delay minutes as outputs in CP5, as PPM is a more passenger focused measure. In their review of CP4 regulated outputs, Arup stated that delay minute outputs may drive Network Rail to focus more on delay attribution than on the root causes of delay. Network Rail has also not proposed to set delay minutes outputs for CP5.

3.48 During CP4 we concluded that it was most effective to focus on and hold Network Rail to account for delivery of the measures that most closely reflected the passengers' experience – PPM and CaSL. However, delay minutes are a useful measure for identifying performance trends and should continue to be reported as an indicator (see below).

Performance of individual TOCs

3.49 We needed to decide whether there should be performance outputs at franchised TOC level, and if so whether these outputs should be set by ourselves or the industry, and, as a related point, whether TOCs should achieve a minimum PPM by the end of the control period.

3.50 In our outputs consultation we said it is essential that PPM and CaSL outputs are set for each TOC, because Network Rail could otherwise try to meet the national output by focusing efforts and resources on some TOCs to the detriment of others. Network Rail's consultation response said it did not agree with ORR set operator level performance outputs, but proposed that TOC PPM trajectories are agreed via the

JPIP[79] process, and this had wider support in the industry. This approach has been discussed by the industry, and we have worked with the National Task Force to agree governance protocols for unsatisfactory or unresolved JPIPs.

3.51 We support the industry's proposal and commitment to the JPIP process and we have decided that PPM and CaSL in year one of the agreed two year JPIPs should constitute outputs (a rolling annual output). We expect Network Rail to include annual forecasts by operator in the CP5 delivery plan and to update these forecasts during the control period. We also agree that an escalation process, culminating in a referral to ourselves and DfT / Transport Scotland is appropriate if outputs cannot be agreed (see chapter 23 on monitoring).

3.52 We have decided that there should be a minimum point such that no franchised TOC in England & Wales exits the control period with a PPM (MAA) of less than 90%; this will be an output and is consistent with our CP4 determination which was based on getting all TOCs to 90% (although this will not be achieved). A minimum level of 90% would not significantly impact on the CP5 national output level as the poorest performing TOCs run relatively few services and therefore have a relatively small impact on national PPM.

Performance indicators

3.53 We needed to decide what performance indicators should be reported in England & Wales to enable us to understand factors causing variance from the regulated outputs, and whether:

(a) trajectories should be set for these indicators; and

(b) the level of disaggregation at which these should be reported.

3.54 Our draft determination for CP5 includes fewer performance outputs than were set in CP4, when sector level outputs and outputs for delay minutes were set. However, it is essential that a number of other indicators are reported in order to help us understand performance and monitor risk to delivery of the regulated outputs.

3.55 We have concluded that the following data should be reported each period to enable the understanding referred to above:

[79] Joint performance improvement plans (JPIPs) are based on a two-way obligation of Network Rail and the train operating company (TOC) to improve performance

(a) delay minutes, split by category (including Network Rail on TOC, TOC on self and TOC on TOC) for National, England & Wales, sector, Network Rail route and JPIP;

(b) PPM by sector and service group[80];

(c) CaSL by sector and service group;

(d) PPM and CaSL at TOC level (annual as an output);

(e) right-time performance by England & Wales, sector and JPIP;

(f) average lateness by England & Wales, sector and JPIP; and

(g) freight delay minutes, nationally and by strategic freight corridors.

3.56 We require Network Rail to publish data related to these measures in a transparent and accessible manner. Network Rail should set trajectories for all the above indicators at national level (this could be done in its JPIPs or FPIPs[81]). The trajectories will not constitute outputs, but variation from a trajectory may indicate a trend which raises regulatory concern about likely future compliance with an output.

Performance in Scotland

3.57 We needed to decide whether:

(a) the SBP contains sufficient evidence that the Scotland HLOS end of CP5 and annual PPM outputs will be met; and

(b) the proposed package of KPIs for Scotland addresses the additional HLOS requirements.

3.58 Network Rail has built a plan to deliver between 91.5% and 93% PPM by the end of CP5 and one of the key assumptions of this plan is for Scotland to outturn 92.0% at the end of CP4. However, at the end of year 2012-13, Scotland outperformed its outputs and our analysis shows that we expect Scotland to achieve better than 92.0% at the end of CP4, therefore increasing the confidence of delivering 92.5% at the end of CP5.

[80] A subset of operators' services most commonly used for performance analysis purposes.

[81] Freight performance improvement plans (FPIPs) are based on a two-way commitment by Network Rail and the freight operating company (FOC) to improve performance.

3.59 The second aspect of the HLOS requirement is for performance of each franchise let by Scottish Ministers to not fall below 92.0% in any given year of the control period. We recognise that there are potential performance risks, such as the Edinburgh to Glasgow Improvement Programme, however we believe that the anticipated CP5 entry point and the projected improvement in asset failure rates should enable Network Rail to deliver at least 92.0% in each year of the control period.

3.60 We have therefore concluded that Network Rail's SBP for Scotland is likely to deliver the HLOS output for PPM (MAA).

3.61 We are working with Network Rail, Transport Scotland and the Association of Train Operating Companies to develop a package of indicators to monitor performance in Scotland. The full package will be confirmed in our final determination, but will include:

(a) right time performance and PPM for ScotRail and ScotRail service codes;

(b) right time performance and PPM for long distance TOCs (Caledonian Sleeper services), peak time commuter services (heavily used and intermediate stations) and the 100 most heavily loaded trains; and

(c) trains run (normal plan, amended plan, actually run) during severe disruption.

3.62 This package will address the seven key objectives outlined in the Scotland HLOS and cover the most important aspects of passenger experience, focusing on heavily used trains and stations. It also acknowledges the importance of right-time operation, delivery in times of disruption and reliability of connections.

Addressing the poorest performing services or those with greatest economic impact

3.63 We needed to decide whether the plan outlined in Network Rail's SBP and supporting documentation to "focus on worst performing service groups" is adequate to meet the England & Wales HLOS expectation[82].

3.64 Network Rail identified the worst performing service groups in its SBP submission[83] and has ascribed a value (low, medium, high) to peak and off peak services within

[82] "In respect of both PPM and CaSL, the Secretary of State requires that the industry focuses on improving the worst performing routes and those on which lower levels of reliability have the greatest economic effect and would wish to see a plan is produced to this effect."

[83] See Appendix 2 to *CP5 strategic business plan supporting document – performance plan for England Wales and Scotland*, Network Rail, available at:

these service groups. This has generated useful analysis for identifying the services that should be targeted.

3.65 However, the performance plans for England & Wales and Scotland, and the supporting route plans do not include any detail for how performance of these service groups will be improved beyond the performance improvement that will be driven by the route and national activities outlined. Network Rail has confirmed it will include more detail in the JPIPs.

Freight performance

3.66 We needed to decide whether to have a freight performance output and if so what it should be.

3.67 Neither HLOS specified output requirements for freight train service performance, but it is important for freight customers that such an obligation is in place. In our outputs consultation we proposed development of a new freight measure based on passenger CaSL. Responses to our outputs consultation indicated that the current CP4 output (Network Rail caused freight delay per 100 train kilometres) was not directly relevant to freight end users and recommended it was replaced with a new measure.

3.68 The Freight Recovery Board has developed the FDM, which measures the percentage of freight trains arriving at their destination within 15 minutes of scheduled time. It only covers delay or cancellation caused by Network Rail.

3.69 Network Rail has modelled the relationship between the CP4 and CP5 measures which shows that its forecast CP4 outturn of 2.94 delay minutes per 100tkm is equivalent to 95.4% FDM.

3.70 Network Rail has proposed to introduce a national performance output of 95% for each year of CP5 and a performance floor of 91.35% with no regulatory intervention if performance remained above this level.

3.71 We agree that the FDM should replace delay minutes as the regulated output for freight performance. The FDM has been developed with agreement from the Freight Joint Board[84] and has a good level of industry and customer support. This aligns with

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http://www.networkrail.co.uk/browse%20documents/strategicbusinessplan/cp5/supporting%20documents/outputs/performance%20plan%20for%20cp5.pdf.

[84] The Freight Joint Board replaced the Freight Recovery Board, as a voluntary industry-led initiative.

Arup's review of CP4 regulated outputs, which concluded that a new freight measure should be developed that more accurately reflects the impact of Network Rail on freight flows.

3.72 We agree with Network Rail that outputs should be set at a national level as it is difficult to predict which freight operators will be operating paths throughout CP5.

3.73 We do not agree with Network Rail's proposals for a performance floor in CP5 of 91.35% as we believe that it is based on a number of downsides to performance and does not take into account any potential benefits. It also assumes that factors that could have an adverse effect on performance, such as traffic growth and increased speed, take effect on day one of the control period when we would expect these to be phased into any projection.

3.74 We have concluded that the output for FDM should be set at 92.5%, which reflects the uncertainty of the CP5 start position and downsides to performance during CP5 such as traffic growth, weather and engineering work. This output will be annual and has been set based on the assumption that improvement opportunities should reasonably offset downside risks.

3.75 FDM is a new metric and it will be important that we monitor it particularly carefully. We intend to use a number of supplementary indicators, including the CP4 measure (Network Rail caused freight delay per 100 train kilometres). We will also define other indicators to measure FOC caused delays. These indicators will not form regulated outputs, but are designed to provide information on areas which are not fully reflected in the FDM and act as a check against any perverse behaviour that might result from strategies designed to drive improvements against the FDM.

3.76 Network Rail and the freight operators are working on a wider set of initiatives to improve performance. For example, reducing FOC on TOC delays by better timetable planning and greater use of pre-validated paths and on the use of capacity in terms of reducing the number of paths in the timetable database that are not required.

Our decisions on enhancements

3.77 We said in the outputs consultation that we intend to continue to have milestones for enhancements in Network Rail's delivery plan and to have a change control mechanism. Both these approaches worked well in CP4 and are widely supported. Setting out when Network Rail will deliver each stage of a project, and keeping this

updated, is useful information for stakeholders and customers. We will use these milestones to monitor whether Network Rail is on course to deliver each project. We will categorise some of the milestones as outputs.

3.78 Although the outcomes of delivering enhancements are not specifically picked up in the National Passenger Survey they can be one of the biggest drivers of satisfaction in areas where the benefits are delivered. Therefore, we will make sure that outputs are based on the timing of the delivery of passenger and freight customer benefits, as this is what matters to customers. These will be finalised in the enhancements delivery plan, which will be published by Network Rail and agreed by us before the start of the control period. A draft will be published in December 2013 and open to wider consultation before being finalised by March 2014. In this way the delivery milestones will reflect stakeholder input, and the main issue here is likely to be ensuring a match between service level changes operators are trying to deliver and Network Rail's infrastructure changes. For example, matching up the delivery of longer platforms for when longer trains are expected to be introduced.

3.79 For projects at an early stage of development the regulated outputs in the March 2014 delivery plan will be to achieve GRIP 3 (see Table 9.2). After that they will be changed to the delivery milestones when these are defined. Detailed outputs of the enhancements projects are dealt with in chapter 9 alongside efficient costs, as the two are closely linked.

Our decisions on health and safety outputs

3.80 We needed to decide what outputs, indicators and enablers we will use to hold Network Rail to account on health and safety.

3.81 Network Rail has a legal obligation under the Health and Safety at Work etc. Act 1974 to maintain and, where reasonably practicable, improve health and safety.

3.82 We are setting one output for level crossings. Network Rail is required to deliver a plan of projects in CP5 to achieve the maximum possible reduction in risk of accidents at level crossings using the £67m ring-fenced fund made available by the Secretary of State. This is in addition to Network Rail's legal duty to reduce risk so far as is reasonably practicable.

3.83 Network Rail for the first time has produced a long-term strategy for health and safety and set its own vision and goals. These include, for example, eliminating all fatalities

and major injuries with a 50% reduction in train accident risk by 2019. We will monitor Network Rail's implementation of its new strategy.

3.84 Network Rail has said it will use RM3 along with other measures to determine the success of its safety and wellbeing strategy, but has not explained what other measures it will use. We will continue to use RM3 as an enabler as the information used by the model is generated through our inspection work.

3.85 More generally we will continue to monitor and inspect Network Rail's health and safety performance and where necessary use our regulatory tools to secure legal compliance and continuous improvement. We expect Network Rail to develop measures to show how it is improving its management of health risks.

Our decisions on network availability

3.86 In CP4 we set outputs for passenger and freight disruption using the PDI-P and PDI-F measures. For CP5 we needed to decide if network availability outputs should be set, and what the levels of the outputs should be.

3.87 In our outputs consultation we said we thought it is essential that there continue to be obligations on Network Rail to reduce disruption to passengers and freight from engineering work. We noted the potential development of a new metric but, given a lack of industry consensus, proposed to continue setting PDI-P and PDI-F as the output. Network Rail agreed with this approach in its consultation response.

3.88 In their review of CP4 regulated outputs, Arup said PDI-P and PDI-F are difficult to understand and very few people can articulate the calculation process. They also said few people understand how their actions impact on the results, or indeed if it is driving the right behaviours. Network Rail is working with the industry to develop an alternative measure based on working timetable (WTT) compliance. Network Rail is proposing to measure network availability using the WTT compliance measure in 2013-14 (in parallel with PDI-P and PDI-F), with a view to replacing PDI-P and PDI-F early in CP5. Arup (in their role as independent reporter) reviewed the accuracy and reliability of the new WTT measure. They concluded that while the measure is more transparent than the PDI metrics, it needs further explanation and development to determine its accuracy in different scenarios.

3.89 Network Rail's CP5 exit forecasts for PDI-P and PDI-F would represent the lowest levels of disruption from possessions since the measures were established. The

profile of the network availability indices proposed by Network Rail has been based on likely spend rather than specific plans. The methodology has been reviewed and validated by independent reporters[85]. In the course of our expenditure review of enhancements and renewals we made a number of adjustments, including the Electric Spine and Waterloo projects. This will affect the exit forecasts.

3.90 Network Rail already produces supporting information to the PDIs, including an industry four-weekly Possession Indicator Report containing supporting and diagnostic metrics such as the volume of bus replacement of train services, advanced notice of possession and overruns, and use of single line working.

3.91 Despite the concerns around the complexity of PDI measures they appear to have delivered their objectives. Disruption to passengers and freight has reduced, as a result of initiatives such as multiple worksites in single possessions and enhancement of diversionary routes. Passengers have also seen a reduction in rail replacement bus hours throughout CP4. Also, despite much discussion of alternative measures no robust alternative has been put forward. Given the direct impact on passengers and freight customers, we have decided to retain PDI-P and PDI-F as outputs, and set CP5 exit outputs for both measures. Network Rail's forecasts are reasonable given the enhancements and renewals planned for CP5, and we are setting outputs at these levels: CP5 exit for PDI-P of 0.539 and a PDI-F of 0.593 (equivalent to a 14% reduction in passenger disruption and a 33% reduction in freight disruption, between 2014-2019, based on Network Rail's forecast CP4 exit). In their response to this draft determination, Network Rail must confirm (by 4 September 2013) if these forecasts have changed in light of our decisions on enhancements and renewals. We will confirm whether any such changes alter the CP5 outputs, in our final determination. Annual forecasts should be agreed between Network Rail and the industry.

3.92 We will encourage the industry to work together on a new WTT metric to run alongside PDI-P and PDI-F during CP5 with a view to changing in CP6. Network Rail will publish the Possession Indicator Report to give greater transparency around possessions and to help identify any potentially adverse trends that might be encouraged by transfer to a new metric.

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[85] *Review of Network Availability Alternative Metrics*, Arup, February 2013, is available at http://www.rail-reg.gov.uk/pr13/publications/consultants-reports.php.

Our decisions on network capability

3.93 We needed to decide how to protect the baseline capability of the network and reflect future enhancements in network capability monitoring.

3.94 In our outputs consultation we said a network capability output is required to provide a minimum level of capability so that Network Rail cannot reduce capability without going through industry processes. Network Rail agreed with this approach in its consultation response.

3.95 The baseline capability of the network will be that in place as at 1 April 2014. This will be described in Network Rail's Sectional Appendices[86], Geographic and Infrastructure System (GEOGIS) Database[87] and National Gauging Database[88].

3.96 Together, these sources must describe the capability of the network in terms of track mileage and layout, line speed, gauge, route availability and electrification type / mileage.

3.97 We require Network Rail to transparently publish all changes to the baseline network capability and update its documentation. Network capability must then be maintained at this level, unless the specification is altered through the industry network change procedure (for example in connection with enhancement projects to deliver increased capacity). This aligns with Arup's review of CP4 regulated outputs, which said that while the outputs of track mileage and layout, linespeed, gauge, route availability and electrified track capability have not changed much nationally, they are nevertheless useful measures to ensure capability does not deteriorate.

3.98 Network Rail must ensure that during and following the devolution of some management decisions to route level, the collection and provision of capability data are maintained on a consistent and timely basis across all routes and network headquarters.

3.99 We will publish an annual summary of capability changes.

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[86] Network Rail publishes a Sectional Appendix for each route that are current statements of the operational performance of the network, including changes to the baseline.

[87] Geogis is a database maintained by Network Rail containing information on the location of track, buildings and structures.

[88] National Gauging Database is a database maintained by Network Rail containing gauge clearance of rail traffic in Great Britain.

Our decisions on stations and depots

3.100 In CP4, station condition is an output and is measured with the SSM. We needed to decide whether to set station condition as an output in CP5 and whether to continue with SSM as the measure. In CP4 depot condition is monitored using the Light Maintenance Depot Stewardship Measure (LMDSM), but is not an output. We needed to decide whether to continue monitoring depot condition using the LMDSM.

3.101 Stations in England & Wales are classified in six categories[89] and outputs are set for each category along with an aggregated output for Scotland. SSM is calculated by assessing the asset remaining life (how long an element is expected to last at the point of inspection) of key elements against the asset life expectancy (how long an element is expected to last when first made).

3.102 In our outputs consultation we said we will continue with the existing SSM as an output and migrate to the new SSM+[90] if agreed with Network Rail. In its response, Network Rail said it believed SSM should be an indicator, reflecting the changing ownership of stations and the fact that it is only one component of the station environment that influences customer experience.

3.103 SSM has been reviewed by the Part A independent reporters for data assurance (Arup) three times in CP4. Data quality has improved from a C4[91] (significant shortcomings in the system and data is accurate to 25%) to a B2 (minor shortcomings in the system and data is accurate to 5%), but is still below our A1 (system is reliable and data is accurate to 1%) data quality expectation. We expect SSM to achieve A1 data quality by April 2017 (see Table 3.8).

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[89] The Department for Transport categorises stations into National Hub (category A), Regional Interchange (category B), Important Feeder (category C), Medium Staffed (category D),Small Staffed (category E) and Small Unstaffed (category F).

[90] SSM+ provides a clearer disaggregation for measuring condition and better, value based, weights using Modern Equivalent Asset Value as the weighting applied to the condition of station components (to replace the current weighting). It also defines the disaggregation at which the condition assessment should take place.

[91] The independent reporter for data assurance (Arup) assesses the reliability of data on a scale of A (appropriate, auditable, properly documented, well-defined and written records, reporting arrangements, procedures, investigations and analysis shall be maintained, and consistently applied across Network Rail) to D (as A, but with some highly significant shortcomings in the system), and accuracy on a scale of 1* (data used to calculate the measure is accurate to within 0.1%) to X (data cannot be measured).

3.104 In our outputs consultation we said we would not set LMDSM as an output, but would monitor it as an indicator, reflecting the supporting role depots play in delivery of other outputs.

3.105 LMDSM is calculated in the same way as SSM – the asset remaining life of a range of elements is compared to asset life expectancy. As with SSM, data quality of LMDSM was reviewed three times in CP4. Data quality improved from a C5 (significant shortcomings in the system and data is accurate to 50%) to a C2 (significant shortcomings in the system and data is accurate to 5%), but is still well below our A1 data quality expectation. We expect LMDSM to achieve A1 data quality by April 2017 (see Table 3.8).

3.106 Stations are a key passenger interface, and a determinant of passenger satisfaction on the railway. Station condition is also a potential safety concern and poorly maintained stations can present a risk to passengers. We therefore view station condition as very important and have decided to retain SSM as a regulated output in CP5. We require Network Rail to maintain station condition at anticipated CP4 exit levels[92] and achieve the SSM figures they have provided to ORR (see Table 3.5 below) in their SBP clarifications.

Table 3.5: Annual Station Stewardship Measure outputs for CP5

Station Stewardship Measure	2014-15	2015-16	2016-17	2017-18	2018-19
Category A (England & Wales)	2.24	2.24	2.24	2.23	2.23
Category B (England & Wales)	2.34	2.33	2.33	2.33	2.32
Category C (England & Wales)	2.40	2.40	2.39	2.39	2.38
Category D (England & Wales)	2.40	2.39	2.39	2.38	2.38
Category E (England & Wales)	2.40	2.40	2.39	2.39	2.39
Category F (England & Wales)	2.48	2.47	2.47	2.46	2.46
Scotland	2.33	2.33	2.33	2.32	2.32

3.107 We have decided that LMDSM should continue to be an indicator in CP5. It will be monitored as an asset condition measure (see Table 3.10).

[92] A lower SSM score indicates a better station condition.

Our decisions on asset management

3.108 In our outputs consultation we noted that, although Network Rail's management of its assets had improved, the pace of change had not been fast enough. Network Rail's SBP submission clearly shows that the position is uneven, varying across the assets, and we have regularly set out our concerns about problems in particular geographical areas. Recent data casts doubt on Network Rail's delivery of its own plans.

3.109 Although we support the move to a more devolved structure, it also raises new challenges. The new route directors for asset management will be integrated with the maintenance delivery organisation, providing a sharper focus on targeting the management of the assets on delivering the operational railway at the route level. But asset management capability is unlikely to be fully embedded at the route level yet, and it will take some time for the structure to evolve, as the central organisation focuses on providing more of a specification and assurance role.

3.110 Our consultation said that we needed to be able to measure Network Rail's progress in terms of:

(a) asset management capability;

(b) data quality;

(c) the delivery of the ORBIS programme;

(d) asset condition;

(e) asset performance; and

(f) the delivery of its assets policies in terms of volumes of work.

3.111 We said that we were considering setting the first three areas as outputs in order to drive faster improvement.

3.112 We were disappointed that Network Rail's SBP response on asset management did not fully address the concerns we had raised in our outputs consultation, the ongoing concerns we had raised about delivery, or provide assurance on how the relationship between the central organisation and the routes will work.

3.113 Excellent asset management is a critical pre-cursor to a high performing, efficient and safe railway. We have decided that to secure the improvements that we consider are needed (and Network Rail also says are needed) we now need to set asset management outputs in line with our consultation proposal.

Asset management capability

3.114 The quality of Network Rail's asset management capability is a key determinant of its performance and efficiency both during the control period and in the longer term. The independent reporter (AMCL) carries out regular assessments of Network Rail's maturity against its Asset Management Excellence Model (AMEM, see Table 3.6 below). This model currently has 23 activities that are split into six core groups with each given a score from 0 to 100. A score of over 70 is needed to be in the excellent category.

3.115 Network Rail and ORR jointly agreed trajectories for CP4 in order for Network Rail to meet its commitment of best practice. AMCL's latest assessment[93] has shown that while Network Rail has made progress, it only met two of the six targets as at January 2013. This reinforces our view about the slow pace of progress by Network Rail.

Table 3.6: Asset Management Excellence Model – Network Rail's capability progress in CP4

Core Groups	Network Rail as assessed 2009	AMCL Roadmap Target for SBP	Network Rail as assessed at SBP
1 - Asset Management Strategy & Planning	56.3%	64.7%	65.8%
2 - Asset Management Decision-Making	47.3%	59.7%	58.7%
3 - Lifecycle Delivery Activities	64.8%	70.5%	69.2%
4 - Asset Knowledge Enablers	51.7%	63.5%	60.7%
5 - Organisation & People Enablers	63.0%	71.1%	67.3%
6 - Risk & Review	49.5%	58.1%	60.8%

3.116 During CP5 we expect Network Rail to make sufficient progress in asset management maturity that the renewals and maintenance parts of its SBP for CP6 are based on a bottom-up workbank for the whole of CP6, created by applying its asset policies to all assets in all asset groups, in accordance with good asset management practice, and condition 1.19 of the Network Licence. To help ensure Network Rail's SBP for CP6

[93] *2013 SBP AMEM Assessment*, AMCL, May 2013, is available at http://www.rail-reg.gov.uk/pr13/publications/consultants-reports.php.

meets our expectations, we have decided to set outputs for the asset management excellence scores, one for each of the six core groups, which should be achieved by the time of the CP6 SBP submission, in year four of CP5.

3.117 We expect Network Rail to continue to improve its asset management capability after its CP6 SBP submission, so we have also set outputs for the end of CP5.

3.118 The outputs are shown in Table 3.7. They are based on AMCL's projection of Network Rail's maturity in asset management taking into account the progress it is expected to make by the start of CP5.

Table 3.7: Our decisions on CP5 capability outputs

Core Groups	Assumed Entry CP5 (March 2014)	Output for CP6 SBP Baseline (January 2018)	Output for End CP5 (March 2019)
1 - Asset Management Strategy & Planning	67%	73%	75%
2 - Asset Management Decision-Making	64%	70%	73%
3 - Lifecycle Delivery Activities	70%	74%	75%
4 - Asset Knowledge Enablers	68%	75%	77%
5 - Organisation & People Enablers	73%	75%	76%
6 - Risk & Review	63%	70%	72%

3.119 Network Rail intends to measure capability not just at the company wide level but at the route level where asset management decisions will increasingly be taken. Not all of the AMEM can be readily applied at route level because part of an organisation's score is based on the maturity of its policy and strategy documents, which are held at head office level, rather than at a route level. We will work with Network Rail to help develop an asset management capability 'lite' indicator, to monitor progress at route level. This will be in place for our final determination.

Asset data quality

3.120 Asset management is only as good as the data on which it is based. As our analysis in the maintenance and renewals chapter shows, poor data reduces the quality and value of Network Rail's SBP plans for maintenance and renewals.

3.121 We already have a standard method for assessing asset data quality based on confidence grading of data reliability (the process or 'governance' for producing the data: A to D scale) and a grading of accuracy and completeness (1* to 6).

3.122 We have decided to set national data quality outputs by asset. Network Rail cannot be an excellent asset manager without reliable data about all asset types. We therefore require all asset types to be grade A for reliability. The baseline for the outputs will be determined by the recent audit carried out by Arup[94] which provides a grading for each asset type.

3.123 We are setting the outputs (see Table 3.8 below) for improving asset data quality to ensure that Network Rail is in the best place to inform its strategic business plan for CP6, hence Network Rail is required to meet the output levels by April 2017 and at least maintain this level by the end of CP5.

Table 3.8: Our decisions on asset data quality outputs

Asset Data Quality	Asset Data Quality	Asset Data Quality
Asset Groups	**May 2013 ARUP Scores**	**CP6 SBP (April 2017)**
Track		
Plain Line	B3	A2
Switches & Crossings	B3	
Signalling		
Interlockings	A2	A2
Signals	A3	
Train Detection Equipment	A3	
Point Operating Equipment	A3	

[94] *Audit of asset data quality*, Arup, May 2013, is available at http://www.rail-reg.gov.uk/pr13/publications/consultants-reports.php.

Asset Data Quality	Asset Data Quality	Asset Data Quality
Asset Groups	**May 2013 ARUP Scores**	**CP6 SBP (April 2017)**
Level Crossings	A2	
Telecomms	-*	A2
Electrical Power		
High Voltage Switchgear	-*	A2
Transformers	-*	
Overhead Line Equipment	B2	
Conductor Rail	B4	
High Voltage Cables	-*	
Buildings	B1	A1
Structures		
Underline Bridges	B5	A2
Overline Bridges	B5	
Earthworks	-*	A2

*The data quality of these asset types has not been fully assessed at the time of publication.

ORBIS milestones

3.124 The ORBIS programme represents a major investment in asset management by Network Rail. The programme is reasonably well defined and we have been provided a series of specific milestones. Table 3.9 summarises the milestones we will regulate against. The success measure of each milestone will be our approval of each milestone's completion report.

Table 3.9: Our decisions on ORBIS milestone outputs

Milestone	Description	Date
Linear Asset Decisions Support (LADS) National rollout complete	LADS will bring together disparate track data sources to enable Network Rail to target work more efficiently	May 2014
Handheld - Fault and incident data capture app roll-out complete	The new app will enable maintenance staff to enter fault data directly into operational systems from the track, speeding up data capture	August 2014

Milestone	Description	Date
Signalling Decision Support (SDS) National rollout complete	SDS will bring together disparate signalling data sources to enable Network Rail to target work more efficiently	September 2015
Electrification & Plant Decision Support (E&PDS) National rollout complete	E&PDS will bring together disparate Electrification & Plant data sources to enable Network Rail to target work more efficiently	December 2015
Replace CARRs (Civils Asset Register & Reporting system)	Ellipse designated as master system for Civils and CARRS database switched off. Asset hierarchies established for all surveyed structures in Ellipse condition module	June 2016
GEOGIS decommissioned	Disparate data systems will be replaced by an overarching Master Data Management solution	December 2016

3.125 We have decided that the milestones stated in Table 3.9 will be regulated outputs, even though we will already have asset data quality outputs. While ORBIS is largely a data quality improvement initiative, the outcome of the programme is broader, covering process changes to convert data into knowledge, hence we see these outputs as complementing the asset data quality outputs.

Asset Condition and performance indicators

3.126 An excellent asset management company must have the tools to measure its assets at appropriate intervals, to match the predicted residual life and failure modes (why the asset fails in service) and also to be able to store asset condition information.

3.127 We have decided to monitor a suite of asset condition indicators, at the national and route level, to improve our ability to understand how well Network Rail is delivering. The creation of route asset managers for each discipline (for example, track and signalling) as part of devolution, places asset management much closer to both maintenance and renewal delivery and is a move we very much support. We need to adapt our monitoring approach accordingly, although it is for Network Rail to determine how best to manage its routes and other business units. We see a strong read across to other parts of our output framework – for example understanding whether higher performance could be delivered at an individual TOC level may depend on asset performance at the route level.

3.128 We have developed a series of proposed measures of condition (sustainability) and performance (robustness) with Network Rail. The measures which we will monitor as indicators are defined in Table 3.10 below. Network Rail will publish these indicators in the delivery plan.

Table 3.10: Asset condition indicators for CP5

	Robustness (Periodic)		Sustainability (Annual)	
Asset discipline	**Measure**	**Broken down by**	**Measure**	**Broken down by**
Track	Number of broken rails	Route	Track - Used Life - Rail	Route
	Plain Line Track geometry	Route	Track - Used Life – Switches & Crossings	Route
	Track failures (service affecting)	Route	Track - Used Life - Sleepers	Route
			Track - Used Life - Ballast	Route
Signalling	Signal failures (service affecting)	Route	Signalling Condition Index (Signalling Infrastructure Condition Assessment Remaining Life)	Route
Telecoms	Telecoms failures (service affecting)	Route	Telecoms - Remaining Life	Route
Electrical Power	Alternating Current traction power failures (service affecting)	Route	Electrification & Plant (E&P) - Remaining Life - Conductor Rail	Route
	Direct Current traction power failures (service affecting)	Route	E&P - Remaining Life – Overhead Line Equipment	Route
	Non traction operational power supply failures (service affecting)	Route	E&P - Remaining Life - Signalling Power Cable	Route

	Robustness (Periodic)		Sustainability (Annual)	
Asset discipline	**Measure**	**Broken down by**	**Measure**	**Broken down by**
Buildings	Reactive faults (requiring repair with 2 or 24 hours)	Route	Percentage Asset Remaining Life - Stations	Route
			Percentage Asset Remaining Life – Light Maintenance Depots	Route
Structures	Number of open faults with a risk score ≥20	Route	Structures – Primary Loadbearing Element Condition Banding	Route
			Tunnel Condition Monitoring Index	Route
Earthworks	Earthwork failures	Route	Earthworks - Condition Banding	Route
Drainage	None		Track Drainage - Condition Banding	Route
			Earthwork/Structure Drainage - Condition Banding	Route
Points	Points failures (service affecting)	Route	None	
On Track Plant	To be determined (Based on Availability)	National	None	

Volume indicators

3.129 The licence requires Network Rail to present asset policies that show how maintenance and renewals will be prioritised (i.e. where and in what order it will be done) and explain engineering / technology choices. We have assessed the policies through challenge by our own engineers and expert reporters. But we have not dictated any aspect of policy detail.

3.130 We consider that the policies have passed our robustness and sustainability tests, to establish that they will continue to work in the long-term, without causing maintenance and renewals backlog (see maintenance and renewals chapter 8).

3.131 Network Rail has used its models to turn the policies into a series of activity volumes, to be published (e.g. in its delivery plan), which profiles the work over the prospective five year control period. We do not set the required volumes or drive Network Rail to carry out renewals on less busy routes to meet volume or unit rate targets. The priority for individual renewals comes from Network Rail's whole life cost models for each asset group, which it uses to define the work required to meet asset condition targets.

3.132 We are primarily interested in Network Rail's delivery of outputs across the control period and long-term sustainability. We will monitor the maintenance and renewals volumes included in Network Rail's delivery plan, as it is clear from CP4 that there is a correlation between operational performance and volumes of activities such as tamping. We will expect Network Rail's delivery plan to be in line with its asset policies. Network Rail will need to provide us with a justification for any material divergences between the actual volumes delivered in a year and those forecast in the delivery plan and we will monitor this on a forward looking basis (i.e. whether the volumes are likely to be delivered). Taken at a route level these measures will help inform our decisions on the future deliverability of TOC level JPIP performance outputs.

Decisions on the environment

3.133 The HLOSs made it clear that the Secretary of State and Scottish Ministers expect Network Rail to manage the network with minimum impact on the environment. The Secretary of State's HLOS said the industry should set itself carbon and energy efficiency objectives. The Scottish Minister's HLOS seeks a continuous and sustained carbon reduction. We needed to decide how we will measure Network Rail's performance in this area, while avoiding any potential dual regulation (see paragraph 3.138 below).

3.134 In April 2013 the industry-wide Sustainable Rail Programme published its Meeting Rail's Carbon Ambition plan. The plan acknowledges the need to reduce operational and embedded carbon, develop a whole life carbon measurement tool and robustly measure emissions. The plan includes a number of industry-wide actions that will translate to an absolute reduction in traction CO2 emissions of 12% by the end of CP5.

3.135 A number of Network Rail's plans will have positive environmental benefits. The electrification programme will reduce carbon emissions, and elsewhere in PR13 we are setting incentives to reduce transmission losses for electricity used by rolling stock and to encourage consumption to be metered.

3.136 Network Rail produced carbon emission and intensity forecasts in the SBP and we (jointly with Network Rail) commissioned the independent reporter (Arup) to validate the accuracy and reliability of the forecasts. Arup concluded[95] that there was scope for improving the process for producing these forecasts.

3.137 In our outputs consultation we stated that we do not propose to set any environmental outputs for Network Rail in CP5. In their review of CP4 regulated outputs, Arup questioned the value of environmental outputs, given the relative immaturity of the measures. There are also existing environmental and legal obligations on Network Rail[96] and many of Network Rail's sustainable development activities are regulated by others.

3.138 While we are not setting environmental outputs for CP5, we do want to know – and we expect Network Rail to want to know – whether the company is setting itself ambitious and stretching targets. The Secretary of State's HLOS stated the "industry should also set out plans for embedding the rail industry's Sustainable Development Principles[97] and measuring and reducing the carbon embedded in new infrastructure, throughout the lifecycle of programmes and projects. This should include the use of a suitable carbon accounting methodology". We will monitor Network Rail's asset policies and programme / project planning, to ensure this requirement is met.

3.139 Network Rail plans to forecast and report on the following indicators in CP5:

(a) Scope 1 and 2 carbon dioxide emissions associated with Network Rail's own operations (traction, non-traction and total);

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[95] *Review of Network Rail's carbon reduction calculations and CP5 trajectory*, Arup, May 2013, is available at http://www.rail-reg.gov.uk/pr13/publications/consultants-reports.php.

[96] Network Rail is required to report environmental incidents, and events of non-compliance with environmental permits, to the Environment Agency and Scottish Environment Protection Agency. Network Rail is also required to report the condition of Sites of Special Scientific Interest (that it owns) to Natural England, Scottish Natural Heritage and Countryside Council of Wales, and its carbon footprint via the Carbon Reduction Commitment, to Department for Energy and Climate Change.

[97] *The Rail Industry Sustainable Development Principles*, RSSB, February 2009, are available at http://www.rssb.co.uk/SiteCollectionDocuments/national_programmes/sustainable_rail/Rail Industry Sustainable Development Principles.pdf.

(b) carbon and energy efficiency KPIs;

(c) carbon embedded in new infrastructure reporting; and

(d) sustainable development KPIs (to be detailed in the CP5 delivery plan).

3.140 There will be independent assurance of these indicators, to ensure Network Rail's environmental reporting is relevant, accurate and reliable.

3.141 We expect Network Rail to address the recommendations in Arup's report before the revised carbon emission and intensity forecasts are published in its delivery plan. Network Rail's carbon reduction forecasts must also support the industry's goal of an absolute reduction in traction CO2 emissions of 12% by the end of CP5, and a reduction in carbon embedded in new infrastructure.

3.142 It is also vital that railway infrastructure is resilient to climate change and extreme weather. However, our assessment is that Network Rail does not have robust climate change resilience plans. We therefore require Network Rail to provide further evidence (in its delivery plan) of how its assets are resilient to climate change and extreme weather.

3.143 In 2010 the Secretary of State for Environment, Food and Rural Affairs published his Noise Action Plan addressing noise management issues under the terms of the Environmental Noise (England) Regulations 2006. The action plan identified ORR and DfT as the rail authorities required to implement any actions or secure budget for actions. We will work with the DfT and Network Rail to discharge our responsibilities, when the latest noise mapping data is available.

Decisions on other areas

System operator capability

3.144 Good system operation is about achieving the most efficient or 'best' provision and use of the network. This is broader than efficiency in capacity management. It is ultimately about successfully balancing competing customer needs. The importance of good system operation will continue to increase in a world where there is increasing and competing demand for use of an already constrained network.

3.145 We have established four principles for good system operation with Network Rail which are essentially a statement of why it matters. Basically a high performing system operator should achieve:

(a) fair treatment – ensuring that competing demands for access to the network (including from Network Rail itself e.g. to carry out engineering works and to manage performance risk) are treated fairly is an essential characteristic of a high performing system operator. We recognise that there is a risk that alliancing and more bespoke arrangements between Network Rail and TOCs could increase Network Rail's ability and incentive to discriminate between those with competing demands for access to the network;

(b) coordination, network benefits and value – demand for access from many operators, demand for access from Network Rail and demand for access from operators across devolved routes all have to be reconciled. Planning horizons are long and assets are long lived – long-term planning is critical;

(c) transparency – dissemination of information about availability and quality of network identifies where network constraints exist and 'what/where/how' action should be taken efficiently to address them; and

(d) modal reach and integration – as well as internal coordination good system operation covers the smooth and efficient operation of interfaces with adjoining infrastructure within rail e.g. London Underground Limited, High Speed 1 (HS1) and freight terminals, and should also support efficient integration with other transport modes.

3.146 We have taken these principles as a starting point and attempted to define short, medium and long-run system operator functions. We have then attempted to identify possible corresponding measures of performance of these functions.

3.147 In our August 2012 outputs consultation we acknowledged that good system operation is multifaceted and that measuring it would require consideration of the performance of multiple functions. These include timetabling, possessions planning, understanding capacity availability and utilisation, network planning and network change.

3.148 We have so far developed a 'long list' of measures of a range of functions which we are working to rationalise in to a 'short list'. We are applying a common framework to think about the relevance and usefulness of the measures in the long list. This is in the form of a common statement of the characteristics of good measures.

3.149 Our expectation is that the final short list of system operator performance measures will take the form of a dashboard containing a range of indicators. The dashboard should be sufficiently comprehensive without being unduly complex and allow the system operator the opportunity to trade-off between the various indicators, where appropriate, while achieving a good level of performance overall. It will be important that the measures:

(a) reflect factors which the system operator can directly influence or do something about;

(b) are based on existing and readily available data where possible, minimising the need for creation of new measures;

(c) have a value which is readily understood – and preferably one that can be expressed in a common currency e.g. £s; and

(d) reflect value to the full set of stakeholders including Network Rail's customers and its funders.

3.150 We expect that an illustrative dashboard will be drawn up and agreed between Network Rail and ourselves in time for inclusion in the final determination. The dashboard will measure Network Rail's system operator performance, which will be an enabler in CP5. The exact content of the dashboard will be consulted on by Network Rail as part of its December 2013 draft delivery plan. We will expect Network Rail to publish its performance against the measures on an annual basis throughout CP5. Once we have a track record of data we will consider whether the dashboard needs to be refined, to ensure it accurately measures Network Rail's system operator progress.

3.151 Our ultimate aim is to establish, in the course of CP5, whether we need to develop specific incentives to drive improvements in performance in aspects of the system operator functions.

Programme management capability

3.152 In our outputs consultation we stated that Network Rail needs to monitor its own capability in programme and project management. We also said we expect Network Rail to propose a framework for each of these areas by which we can also monitor its progress. We are working with Network Rail to agree a way in which it can assess its progress.

3.153 We have commissioned the independent reporter Nichols to provide constructive challenge to Network Rail in its assessment of how best to achieve external assessment and accreditation of its programme and project management.

3.154 We have therefore decided to include an enabler that measures Network Rail's effectiveness in programme and project management capability. We will confirm the metric in our final determination.

Customer service maturity

3.155 We needed to decide whether Network Rail's customer service maturity should be an enabler in CP5 and whether it should set a trajectory for its level of maturity through CP5.

3.156 Network Rail has been measuring the satisfaction of its passenger and freight operator customers through its annual survey throughout CP4. The survey gives a good guide but does not allow Network Rail to understand if it is a genuinely customer-focused organisation.

3.157 Network Rail has been developing an appropriate model for measuring its overall level of customer service maturity in CP5. It committed to establishing a trajectory for its customer service maturity in its SBP. We support this approach and believe that the model that it is developing will provide a much fuller picture of the level of service delivered to its customers than its annual survey alone. However, the SBP did not specify any detail as to how it proposed to do this.

3.158 We have been monitoring progress of Network Rail's work to establish the trajectory. Network Rail has appointed KPMG to work with it to identify, develop and implement an appropriate model and establish a trajectory for the end of CP5.

3.159 Network Rail needs to develop a clear roadmap for establishment of an appropriate model. Network Rail has committed to consulting the industry on its proposed metric and action plan for implementing the model. The results of its consultation will be critical and we will need to ensure that Network Rail responds positively to feedback received and uses it to develop a model for implementation.

3.160 We require Network Rail to develop a customer service maturity model, with trajectories and action plan. Network Rail will use the model to baseline performance as of 1 April 2014, and the model will be an enabler for excellent customer service maturity throughout CP5.

Passenger satisfaction

3.161 We are focused on improving the passenger experience. Supporting a better service for passengers is a key corporate objective for ORR and a priority for the wider rail industry.

3.162 The National Passenger Survey (NPS, Passenger Focus) provides biannual passenger satisfaction results for the rail industry. We monitor it to assess progress in the passenger experience across the network.

3.163 We have included the NPS as an indicator in our output framework. This will support continuous improvement in service and raise awareness of our passenger role.

Journey time

3.164 We needed to decide if a process is required to establish a metric to measure journey time.

3.165 The Secretary of State and Scottish Ministers' HLOSs both acknowledge the importance of reducing journey times. There are several initiatives planned for CP5 (including the Edinburgh to Glasgow Improvements Programme and investments in the Great Western, East Coast and Midland Main Lines) that will cut journey times across borders, and between key cities.

3.166 In our outputs consultations we said it is important that performance improvements must not be achieved at the expense of journey times. We acknowledged that developing a metric would be challenging, but nevertheless advantageous given the funds committed to journey time reduction. In its response, Network Rail said a journey time indicator would be complex, but a metric linked to improvement funds could be considered. We will work with the industry and funders to develop a journey time metric.

3.167 Transport Scotland also emphasised that a process needed to be established so that Network Rail takes advantage of opportunities to reduce journey times, for example when carrying out renewals work. We will monitor Network Rail's progress in this area.

Cross-border service availability

3.168 We needed to decide if there should be a requirement on Network Rail to make at least one cross-border (between England and Scotland) route available at all times.

3.169 The Scottish Ministers' HLOS said "Cross border rail services provide vital connections for passengers, key routes to market for freight users and contribute to regional economic development, including within Scotland. In support of this, the Scottish Ministers require that where maintenance, renewal or enhancement activity is required on cross border routes, at least one of those routes will be planned to be available at all times for the passage of timetabled sleeper, passenger and freight services through to London without the need for change."

3.170 This requirement spans both England and Scotland and the Secretary of State did not specify a similar requirement. It is not clear what costs would be involved in providing a total guarantee one route would always be open. Network Rail's SBP acknowledges the importance of the requirement, but highlights potential difficulties on certain dates, such as English Bank Holidays.

3.171 We have decided that the availability of a cross-border route (as described in the Scottish Ministers' HLOS) will be an indicator. Network Rail must use all reasonable endeavours to keep at least one cross-border route open at all times, but we recognise that this may not always be possible. We will review this requirement throughout CP5 and discuss with Transport Scotland, DfT, and Network Rail.

Change control

3.172 In CP4 we have a change control mechanism for enhancements. This has worked well and (for example) allowed us – in consultation with the industry - to adjust enhancement programmes when the scope or requirements has changed.

3.173 Network Rail has proposed that a broader mechanism is introduced to allow other outputs to be changed in one specific circumstance – where the DfT or Transport Scotland specifies franchises in a way which is materially inconsistent with Network Rail's outputs.

3.174 We agree this is sensible and allows the regulatory settlement and franchising to be more joined-up. We have therefore decided to, in principle, introduce a change control mechanism for performance outputs, on the terms outlined above.

3.175 Any change to a regulated output will involve consultation with affected parties. We will make the final decision on change control requests. We will be discussing this further with government and Network Rail, to define the details of the change control mechanism and provide further guidance to all parties.

CP5 output framework

3.176 This chapter confirms the decisions we have taken on outputs, indicators and enablers. It presents our analysis of HLOS requirements, Network Rail's SBP, independent reporter studies and consultation feedback. We have considered all of these in specifying our output framework, which is summarised below in Table 3.11.

Table 3.11: Our decisions on the CP5 output framework

Area	Outputs	Indicators	Enablers (these support all output areas)
Train service reliability	• PPM: for England & Wales (annual with a CP5 exit of 92.5%), Scotland (annual 92% and CP5 exit of 92.5%) and franchised TOCs in England & Wales (rolling annual outputs with no TOC to exit CP5 below 90%) • CaSL (England & Wales annual and CP5 exit of 2.2%) • Freight Delivery Metric (National annual 92.5%)	• PPM: sector and service group • Right-time performance: England & Wales, Scotland, sector, JPIP and service group • Average lateness: England & Wales, Scotland, sector and JPIP • CaSL: sector and service group • Delay minutes, split by category (including Network Rail on TOC, TOC on self and TOC on TOC): for National, England & Wales, Scotland, sector, Network Rail route and JPIP • Freight delay minutes, national and strategic freight corridor • Scotland KPI package	• Safety management maturity (Railway Management Maturity Model) • System operator capability • Programme management capability • Customer service maturity
Enhancements	• Enhancement scheme delivery milestones (set in an enhancements delivery plan) • Development milestones for early stage projects	• Enhancement fund KPIs (e.g. average scheme benefit cost ratios) • Improved governance processes for HLOS funds • Project activities and milestones	

Area	Outputs	Indicators	Enablers (these support all output areas)
Health and safety	• A plan of projects in CP5, to achieve the maximum possible reduction in risk of accidents at level crossings using the £67m ring-fenced fund		
Network availability	• PDI-P (National CP5 exit of 0.539) • PDI-F (National CP5 exit of 0.593)		
Network capability	• Base requirement at start of CP5 in terms of track mileage & layout, line speed, gauge, route availability, electrification type		
Stations	• SSM by station category, and Scotland (annual)		
Depots		• Light Maintenance Depot Stewardship Measure: England & Wales, Scotland and National	
Asset management	• Asset management excellence (AMEM) capability for each core group at National level • Asset data quality for each asset type at National level • Milestones for ORBIS	• Asset condition for robustness and sustainability at National and route level • AMEM lite capability by core group at route level • Renewal and maintenance volumes by asset type and spend at National and route level	

Area	Outputs	Indicators	Enablers (these support all output areas)
Environment		• Scope 1 and 2 traction and non-traction carbon dioxide emissions: England & Wales and Scotland • Carbon intensity: England & Wales and Scotland • Carbon embedded in new infrastructure • Sustainable development KPIs	
Other		• Passenger satisfaction • Journey time • Cross-border service availability	

Main differences compared to PR08

3.177 Table 3.12 below summarises the main changes in each output area from CP4.

Table 3.12: Summary of differences between CP4 and CP5 output framework

Area	Outputs	Indicators	Enablers (these support all output areas)
Train service reliability	PPM: industry sets TOC level outputs via JPIPs and franchised TOC CP5 exit output Freight: delay minutes measure replaced with Freight Delivery Metric		New safety enabler (Railway Management Maturity Model) New system operator capability enabler New programme management capability enabler New Customer service maturity enabler
Enhancements	New approach for regulating early stages schemes		
Health and safety	New level crossing risk reduction plan output (England & Wales and Scotland)		

Area	Outputs	Indicators	Enablers (these support all output areas)
Network availability (reducing disruption from engineering works)	Potential new (working timetable compliance) measure to run in parallel to PDI-P and PDI-F		
Stations	Potential new (SSM+) measure		
Depots		Light Maintenance Depot Stewardship Measure monitored as part of asset condition suite of indicators	
Asset management	New national capability output (AMEM) New data quality output (confidence grades) New ORBIS output	New asset condition indicators for robustness and sustainability New route capability indicator (AMEM lite) Renewal and maintenance volumes by asset type and spend at National and route level	
Environment		New indicators for carbon dioxide emissions and carbon intensity	
Other		New Passenger satisfaction (National Passenger Satisfaction Survey) indicator New journey time indicator New cross-border route availability indicator	

Next steps

3.178 We will publish our final decisions on the outputs framework in October as part of our final determination. But a number of detailed issues will then need to be completed as part of a wider industry process.

3.179 Most notably Network Rail will need to agree the two year JPIPs with the industry and it will need to agree milestones for its enhancement projects (including completion dates for projects that are well advanced and development milestones for projects at an early stage of development).

3.180 It will publish its plans in draft in its draft delivery plan in December 2013. The final delivery plan will be published in March 2014 following consultation and after our approval.

4. Overview of efficient expenditure

Key messages in this chapter

- Our assumptions on how much money Network Rail needs to spend to deliver its outputs and other commitments are fundamental to our decisions on the company's revenue requirement.
- We have thoroughly reviewed Network Rail's plans across all areas of expenditure to ensure that our assessment is challenging but achievable.
- We have reviewed cross cutting issues such as the management of inflation, which potentially apply to all areas of spend, and issues specific to certain types of spend.
- In maintenance and renewals our assumptions cover the assumed 'pre-efficient' level of spend (which reflect volumes of work and the unit cost of doing this work today) and efficiency assumptions applied to the pre-efficient spend.
- We have set Network Rail a CP5 efficiency challenge on its support, operations, maintenance and renewals costs of 19.6%.
- Our assessment should incentivise Network Rail to reduce its costs in a safe and sustainable way.

Structure of chapter

4.1 This chapter is structured as follows:

(a) introduction to the chapter;

(b) CP4 experience;

(c) approach to our PR13 assessment;

(d) cross-cutting issues;

(e) efficient expenditure assumptions; and

(f) overview of efficiency assumptions.

Introduction

4.2 Assessing the level of efficient support, operating, maintenance, industry costs and rates, renewals and enhancement expenditure that Network Rail needs to deliver its required outputs in CP5, and sustain asset condition for the longer term, is a core part

of our work on PR13. The assumptions we make on the level of efficient expenditure are fundamentally important to our determination of the company's overall revenue requirement.

4.3 The RVfM study set a clear challenge for the industry to reduce its costs. It assumed that Network Rail could deliver between approximately 50% - 75% of the industry savings identified for CP5. Annex G sets outs how our PR13 assumptions compare to the RVfM study findings.

4.4 In our advice to ministers, we set out our assumed savings that Network Rail could make as a range. Our determination is based on more detailed evidence and hence supersedes those estimates.

4.5 Our determination for CP5 provides strong incentives on Network Rail to strive for continuous and sustained improvements in efficiency, building on the improvements in efficiency it has made in CP3 and CP4. Our judgements on the level of efficiency that we consider is challenging but achievable, and indeed could potentially be exceeded without compromising delivery of outputs (including health and safety), are an essential part of this.

4.6 We set out in detail how we reached our assumptions on each expenditure area in the rest of the document. In this chapter we summarise how we approached our assessment.

CP4 experience

4.7 In our PR08 determination for Network Rail we set Network Rail's total support, operating, maintenance and renewals expenditure at £23,380m (2012-13 prices).

4.8 The efficiency assumptions were to reduce its support, operating, maintenance and renewals costs by 21% by the end of CP4 (i.e. the end of 2013-14). Table 4.1 sets out our annual PR08 efficiency assumptions.

Table 4.1: Our PR08 efficiency assumptions

	2009-10	2010-11	2011-12	2012-13	2013-14
Support and operations					
Net efficiency	2.8%	2.8%	4.0%	4.0%	4.0%
Cumulative net efficiency	2.8%	5.5%	9.3%	12.9%	16.4%
Maintenance					
Net efficiency	3.2%	3.2%	4.0%	4.5%	4.5%
Cumulative net efficiency	3.2%	6.3%	10.1%	14.1%	18.0%
Renewals					
Net efficiency	5.0%	5.0%	5.5%	5.5%	5.5%
Cumulative net efficiency	5.0%	9.8%	14.7%	19.4%	23.8%
Total					
Net efficiency	4.2%	4.1%	4.7%	4.9%	4.9%
Cumulative net efficiency	4.2%	8.2%	12.5%	16.8%	21.0%

4.9 Network Rail's PR13 SBP forecast level of efficiency is three percentage points below its original target that would have delivered our PR08 determination. This is likely to mean that on a PR08 basis its efficiency improvement in CP4 will be 18%.

4.10 Our assessment of Network Rail's efficient expenditure in CP5, and hence the efficiency savings that we expect Network Rail to achieve in CP5, assume Network Rail delivers its SBP forecast of its efficiencies at the end of CP4.

Approach to our PR13 assessment

Regulatory techniques

4.11 Regulators use a wide variety of techniques to analyse the scope for savings in regulated companies. No single approach will necessarily provide a definitive answer on the scope for future efficiency improvement. It is preferable to look at evidence from a range of approaches and sources and exercise a degree of judgement in forming a view on what should be achievable. Economic regulators generally use both 'top-down' and 'bottom-up' approaches to assess the scope for efficiency improvement.

4.12 Bottom-up approaches focus on identifying specific improvements in efficiency, based on technologies or working methods that are known about at the time, by those undertaking the study. Therefore, by definition, a bottom-up approach, even if it is

exhaustive in its inclusion of all potential efficiency improvements that are known about at the time, is likely to understate the scope for future improvements in efficiency.

4.13 Top-down approaches typically utilise statistical techniques to produce high-level comparisons between companies or industries taking into account trends over time.

4.14 We consider that we are following best practice in efficiency assessment by using both bottom-up and top-down approaches to complement each other and provide useful evidence to inform our overall judgements.

High level approach for PR13

4.15 We have conducted our assessment of expenditure thoroughly and we have engaged with Network Rail throughout the course of PR13. Network Rail has worked with us constructively throughout the periodic review process. The independent reporters have also provided significant input to PR13.

4.16 In undertaking our assessment, we have considered the impact on safety management and also Network Rail's capability to deliver its work programme in CP5.

4.17 We have adopted a transparent approach to our work and have undertaken a significant amount of analysis to review and challenge Network Rail's submissions, including its performance plans, the asset policies, efficiency assumptions and modelling tools (including the infrastructure cost model) it has used as a basis for its plans.

4.18 At the start of PR13 we said to Network Rail that we wanted it to robustly justify its plans. It has not done this in all areas and Network Rail has recognised that there is scope for further improvements.

4.19 We asked Network Rail to set out its plans for England & Wales, Scotland and the nine England & Wales operating routes separately. Network Rail did this and we have undertaken separate assessments to produce figures for England & Wales, Scotland and for the nine England & Wales operating routes, although much of our underlying analysis has been common to the whole network.

4.20 In broad terms our approach has been to:

(a) review bottom-up calculations of how Network Rail justifies its expenditure in detail, e.g. its planned volumes of work. We have focused on:

(i) route-based assessments. In PR13 we have undertaken more of our efficient expenditure assessments at a route level based on Network Rail's route level submissions, i.e. at a much greater level of disaggregation than PR08; and

(ii) a more detailed bottom-up review of Network Rail's SBP than in PR08;

(b) benchmark Network Rail's activities against other companies in Great Britain and overseas;

(c) carry out top down assessments of Network Rail's overall efficiency for support, operations, maintenance and renewals compared to companies in the UK and in other countries. We have used comparisons against other regulated industries as we did in PR08 and made improvements to our approach compared to PR08 by benchmarking Network Rail more extensively against non-railway comparators and non-European rail comparators and by improving the econometric work we undertook in PR08; and

(d) make a judgement on the level of efficient expenditure taking into account the overall package and the achievable pace of change on efficiency.

4.21 Compared to PR08, we have relied more on our detailed benchmarking analysis and less on the top down international econometric modelling, using the latter as a 'sense check' to give us greater confidence in our analysis.

4.22 One issue that we may need to consider further is that it is not clear how much of Network Rail's efficiencies can come from alliances and other industry initiatives.

4.23 Assessing the efficient level of expenditure for enhancements is different from the approach taken for maintenance and renewal activities, although some of the same data is used. This difference is mainly due to the nature of enhancements projects, which often have bespoke solutions and include significant development and delivery costs spread over several years.

4.24 Our efficient expenditure assessment of enhancements has improved since PR08 in terms of the quality of the data available to us. We have reviewed how Network Rail captures cost data from its existing programme of works and how it uses this information in building cost estimates for the CP5 programme. This work included a review of international and non-rail benchmarks.

Cross-cutting issues

4.25 We have carried out an analysis of possible savings for each area of expenditure. But there are some potential savings – the management of inflation, input prices, frontier shift, employment costs and occupational health – that could apply to all areas of spend. We have termed these 'cross-cutting' issues and this section explains how we have treated these issues.

Network Rail's management of inflation

4.26 In our December 2012 financial issues decision document[98], we set out our approach to incentivising Network Rail to efficiently manage its inflation risk. We explained that in CP5, we will allocate input price risk to Network Rail but we will not allocate general inflation risk to Network Rail. In that document, we also said that we would commission a study to identify how efficiently Network Rail manages inflation risk and that we would further adjust our efficiency assumptions, e.g. increase or decrease them, based on the findings of the study. We considered that this will incentivise Network Rail to efficiently manage inflation in CP5.

4.27 In January 2013, we commissioned Credo to carry out the study into Network Rail's management of general inflation risk and input price inflation risk. The study included both a qualitative assessment and also a quantification of the efficiency of Network Rail's approach to managing inflation risk.

4.28 As part of its review, Credo met with Network Rail's senior management and with other Network Rail staff from its procurement functions. Credo also reviewed a variety of Network Rail's procurement contracts and developed a modelling tool to help quantify the level of efficiency in this area. Credo spoke with 18 infrastructure owners and suppliers to understand how they managed inflation risk. To assess Network Rail's overall effectiveness in managing inflation risk, Credo developed a 15 principle framework which defines what good inflation management might look like.

4.29 Credo found that Network Rail manages its expenditure to hit efficiency targets with inflation layered on top, at RPI, and that inflation is generally thought to be a factor that is beyond Network Rail's direct control. The study reported that Network Rail's paramount drive is to manage down overall costs and this means there is no explicit

[98] *Financial issues for Network Rail in CP5: decisions*, December 2012, available at http://www.rail-reg.gov.uk/pr13/PDF/pr13-financial-issues-decisions-dec12.pdf.

emphasis on managing inflation risk - it is just one of several factors that drive commercial outcomes. Credo highlighted the importance of inflation within Network Rail overall regulatory settlement. For example, it estimates that cumulative general price inflation accounts for 16% (c. £1bn) of Network Rail's total CP4 expenditure, compared to cumulative expected CP4 efficiencies of 23.5% (c. £1.4bn).

4.30 Credo found that Network Rail's 'performance gap' in relation to its management of inflation compared to the industry average was approximately 25%. Credo estimates that it may be possible to close this gap by the end of CP5, which could generate savings between £97m and £433m over CP5 (£257m in its central case scenario).

4.31 As a result of the study, we have made adjustments to our efficiency assumptions to reflect the impact on Network Rail's costs from an improvement in Network Rail's management of inflation. We recognise that it is possible that our other analysis of Network Rail's efficient expenditure may already include some of the savings from improved management of inflation. As such, at the moment we have taken a conservative view of the potential efficiencies that can be realised and applied a 0.2% per annum increase to our efficiency assumptions across Network Rail's CP5 support, operations, maintenance, renewals and enhancement costs.

Input prices

4.32 Input price inflation is the change in the prices of Network Rail's inputs (the goods and services it consumes). Input price inflation can be measured in absolute terms or relative to movements in more general price indices, such as RPI or CPI.

4.33 Our approach to risk and uncertainty in PR13 is to allocate to Network Rail the risks that it is best placed to manage. This should ensure that it is incentivised to secure continuous improvements in value for money and operate commercially where appropriate, e.g. in managing its financial risks. As we consider that it is possible to efficiently control the effect of input price inflation, Network Rail will be at risk for any deviations between the actual inflation that it faces and RPI.

4.34 In support of our approach to input prices in PR13 we have to make assumptions about the level of input price inflation that we expect Network Rail to experience in CP5.

4.35 In PR08, we adjusted our efficiency assumptions to reflect the input price inflation forecasts from a Network Rail commissioned study by LEK. Although we had some

concerns about LEK's methodology and assumptions, we considered that, overall, the results were broadly robust and represented a reasonable estimate of expected input price inflation in CP4.

4.36 However, during CP4, the observed rates of input price inflation are likely to have been significantly lower than the assumptions that we used to adjust our PR08 efficiency assumptions. Network Rail has benefited from the variations from our assumptions.

4.37 As part of its SBP, Network Rail submitted its forecast of CP5 input price inflation. In contrast to its detailed PR08 submission, the CP5 forecast was based on a high-level review of other input price forecasts, including recent regulatory forecasts. Table 4.2 sets out its forecasts. Network Rail has assumed that it will be able to absorb any input price effects within its proposed efficiency profile for support, operations and maintenance costs but not renewals.

Table 4.2: Network Rail's SBP input price inflation forecasts

Expenditure	Input price effect (per annum)
Support and operations	0.00%
Maintenance	0.00%
Renewals	-0.70%

4.38 Given the following considerations, we have decided to make no explicit adjustments to our efficiency assumptions for input price inflation:

(a) the uncertainty in forecasting and measuring input price inflation;

(b) Network Rail has assumed a low level of input price inflation over CP5 on renewals and no input price inflation over CP5 on support, operations and maintenance costs; and

(c) our approach to funding risk, i.e. in our financial framework not providing Network Rail with upfront funding for risks.

4.39 Hence our input price assumptions are zero.

4.40 However, we are still adjusting Network Rail's access charges, network grant and RAB for changes in RPI, as we do not think general inflation is efficiently controllable by Network Rail.

Frontier shift

4.41 Estimates of frontier shift for an organisation are usually inferred through the assessment of historical changes in productivity in relevant sectors (weighted appropriately to match the organisations' activities), with an adjustment, if appropriate, to reflect that some of these sectors may have seen productivity changes owing to 'catch up' as well as frontier shift.

4.42 Network Rail included a report by Oxera in its overall SBP submission, and this provided an estimate of -0.55% to -0.8% per annum for operations and support only[99]. The cumulative effect would be around 2.7% to 3.9% over CP5. This effect was considered by Network Rail together with real price effects when it derived the stretch element of its overall efficiency target.

4.43 Our assessment of the SBP is that while we understand that separating out frontier shift and other efficiencies is complex, some separation is necessary and desirable in order to produce robust results. Furthermore the approach to estimating these effects is well established. For example, the differences in methodology between Oxera's report for Network Rail and CEPA's report for ORR are small.

4.44 In comparison to PR08 and previous work, we have adopted an approach that assesses Network Rail as a whole, rather than separating out separate elements of spend because:

(a) this removes the need to take into account capital substitution[100] effects directly, for which Network Rail had raised concerns; and

(b) we are of the view that assessing frontier shift at a more aggregate level is likely to be more robust.

4.45 Our overall estimate for frontier shift, based on CEPA's analysis undertaken on our behalf (and their subsequent update) is 0.3% per annum which equates to 1.5% for

[99] Note this estimate also includes capital substitution effects.

[100] If frontier shift is assessed against separate parts of Network Rail's activities, then for those activities, the use of capital expenditure to drive efficiencies in those activities needs to be taken account of elsewhere in the business. However, if Network Rail's expenditure is assessed as a whole, the effect of the use of capital expenditure is already taken account of.

CP5 as a whole[101]. This adjustment could apply to Network Rail's total expenditure, including support, operations, maintenance, renewals and enhancements.

4.46 However, we have only made this adjustment in our estimate of enhancements efficiency (the frontier shift for enhancements expenditure only is 0.4%): we have not adjusted our efficiency assumptions for other costs. This is because it is not clear at the moment for those costs whether our efficiency assumptions include effects similar to frontier shift. We will review this issue for our final determination.

Employment costs

4.47 In January 2013, we commissioned Incomes Data Services (IDS) to review Network Rail's total employment costs and determine if they are efficient[102]. The review benchmarked the total reward package for key groups of Network Rail employees against those in other rail and non-rail industry jobs.

4.48 The IDS study found that total reward for Network Rail's role clarity grades (mainly office-based staff, e.g. accountants and information management staff) is around 9% higher than the market rate. IDS found larger gaps for maintenance and operations staff, with maintenance workers' total reward 32% above the market and operations staff 36% above the market rate. IDS's findings are consistent with our PR08 Inbucon report, given that Network Rail's pay awards for operations and maintenance staff have been above inflation in CP4. Network Rail's own analysis is broadly consistent with these findings.

4.49 Network Rail's explanation for its pay strategy for operations and maintenance staff is that it takes a wide view of overall cost savings to be achieved, taking into account factors such as productivity.

4.50 Our determination sets the overall package for Network Rail in CP5. In most cases, it does not state how Network Rail should spend the revenue that it is allowed to recover, e.g. the level of remuneration for its employees or how it should achieve its efficiency savings. The study has reinforced our view that there are significant savings that Network Rail can deliver in CP5 but we have not explicitly adjusted our efficiency

[101] This is in real terms, and is based on CEPAs 'Adjusted TFP' approach with an assumed split of 75% frontier shift and 25% catch-up for the industries upon which the calculations are based.

[102] This is available at: http://www.rail-reg.gov.uk/pr13/publications/consultants-reports.php.

assumptions for the findings of the IDS study because overall our efficiency assumptions are already challenging but achievable.

Occupational health

4.51 An individual's health can be influenced by the workplace. Pro-active occupational health management can be beneficial for the individual and the company and we have supported a greater focus on improving occupational health across the industry.

4.52 This section deals with the efficiencies which we have assumed that Network Rail will be able to achieve in CP5 through improvements in health risk management. In PR08, we did not make specific assumptions in this area.

4.53 In its PR13 SBP, Network Rail outlined its vision for wellbeing through promotion of a healthy lifestyle by encouraging healthy eating and improved fitness. It also acknowledged the need to support line managers in identifying and supporting colleagues with stress-related ill-health. Network Rail suggested that it self-finance its occupational health programme in CP5, i.e. spend on occupational health will be covered by corresponding productivity improvements and hence efficiency savings.

4.54 We carried out our own assessment including industry case studies of successful occupational health initiatives, and their associated cost savings. We also sought the expertise of a leading occupational health consultant in how to quantify the costs of ill-health. These costs are difficult to quantify especially since Network Rail currently holds very little data on the causes for absenteeism and its associated costs. As such, any estimate of efficiency needs to be used with caution.

4.55 In our determination we have, currently, applied a conservative increase to our overall efficiency estimates of approximately 0.07% per annum across Network Rail's support, operations, maintenance, renewals and enhancement costs to reflect the savings which could be achieved through improvements in occupational health, for example in reducing absenteeism. This amounts to approximately £20m of savings in the final year of CP5.

4.56 Network Rail must put in place an effective health programme. But its biggest challenge is to induce a culture change within the organisation to encourage engagement in its occupational health programme. This efficiency assumption will provide an appropriate incentive.

Efficient expenditure assumptions

4.57 This section outlines our specific assumptions in each area of spend, including the cross-cutting savings explained above.

Support costs

4.58 Support costs include expenditure on activities that 'support' Network Rail's business. These are mainly administrative costs, such as costs related to finance, but include other running costs such as utilities costs and insurance.

4.59 In its SBP, Network Rail set out its plan to deliver a 24% reduction in its support costs over CP5. This includes cost reductions by the end of CP5 (compared to 2013-14 costs) of 12% in core support costs.

4.60 Our approach to the assessment of Network Rail's support costs is set out in detail in the support expenditure chapter (chapter 5). In summary, we have decided on a base year and 'rolled forward' costs for that year through each year of CP5 by applying an efficiency assumption. We have derived our efficiency assumption by applying a combination of both top-down and bottom-up approaches. Where Network Rail has provided robust analysis of its functions' costs, we have taken Network Rail's forecast. However, where Network Rail has provided insufficient justification for its forecasts, we have applied a top-down efficiency estimate to our view of Network Rail's pre-efficient costs.

4.61 Our assessment of efficient support costs for CP5 assumes that Network Rail can achieve efficiencies in core support costs of 20% by the final year of CP5 and a reduction in total support costs of 25% by the end of CP5. Overall there is a saving of £647m in CP5 compared to total CP4 support costs of £2,740m.

Operations costs

4.62 Operations costs are those incurred in 'operating' the infrastructure such as costs for signallers and control staff.

4.63 In its SBP, Network Rail set out its plan to deliver a 13% reduction in its operations costs over CP5. Its main proposal for delivering the planned efficiencies is to implement a new way to run its infrastructure, known as the network operating strategy. This will cut Network Rail costs as it will reduce the number of signallers required.

4.64 We have reviewed Network Rail's proposals against various domestic and European benchmarks. We have also conducted our own assessment as to whether the strategy can deliver the proposed benefits. Network Rail will compare favourably with international benchmarks once the strategy is implemented. However, costs for operations activities outside signalling are above benchmarks with other UK regulated industries. For our assessment of these non-signaller costs, we have taken into account domestic benchmarks and savings from cross cutting issues.

4.65 Our assessment of Network Rail's efficient operations costs in CP5 assumes that Network Rail can achieve 17% efficiencies by the final year of CP5. This is a saving of £271m in CP5 compared to total CP4 operations costs of £2,239m.

Maintenance and renewals

4.66 Maintenance expenditure covers the work required to maintain assets efficiently and sustainably. Maintenance work may be either planned (for example, routine or visual inspections) or reactive (for example, responding to asset failures). Maintenance expenditure is forecast and assessed for each of the following main asset categories: track, civil structures and earthworks, signalling, electrification, telecommunications, and plant and machinery.

4.67 Renewals expenditure covers work to replace assets which have reached, or are nearing, the end of their useful lives with the modern equivalent asset. Renewals expenditure is forecast and assessed for the same asset types as maintenance (track, civil structures and earthworks, signalling, electrification, telecommunications, plant and machinery) as well as buildings, and other renewals.

4.68 In Network Rail's SBP, its maintenance plans for CP5 assumed efficiencies of 13.7% by the final year of the control period and total maintenance expenditure in CP5 of £5,243m. (These figures are our interpretation once accounting changes between the periods and the effects of traffic and network growth have been adjusted for).

4.69 Network Rail's renewals plans for CP5 assumed an increase in expenditure requirements compared to CP4, driven by a programme of rationalisation and centralisation of signalling and electrical control, a large increase in expenditure on civil structures and earthworks, accelerated renewals (due to enhancements), a programme to improve asset information and additional investment schemes. It planned efficiency savings of 15.7% by the final year of the control period and total

renewal expenditure in CP5 of £13,791m. (These figures are our interpretation, adjusting for accounting changes between the periods. The efficiencies include those embedded in Network Rail's proposed CP5 asset policies and consider efficiency across all costs classified as renewals, whereas Network Rail's efficiency assumption is based on a subset of renewals asset types.)

4.70 Our approach to the assessment of maintenance and renewal efficiencies is set out in detail in chapter 8. In summary, we have carried out both a bottom-up and top-down assessment of efficiency, including:

(a) a detailed review of Network Rail's plans, including the audit of its benchmarking work and SBP efficiencies;

(b) our bottom-up benchmarking and efficiency studies conducted for PR13;

(c) our review of previous studies (for example those carried out for PR08 and for the RVfM study) and cataloguing of remaining efficiency opportunities; and

(d) our top-down statistical (econometric) analysis of the efficiency gap to the frontier rail infrastructure manager.

4.71 The efficiency assumed in our assessed maintenance and renewal efficient expenditure draws mainly, on (a) to (c) with (d) used as a sense check.

4.72 We assume that Network Rail can achieve maintenance efficiencies of 16.5% by the final year of the control period. We assess that it needs to spend £5,152m on maintenance during CP5, £91m less than proposed in the SBP.

4.73 Our assessment of efficient renewals expenditure for CP5 assumes lower levels of pre-efficient expenditure where its plans were not sufficiently justified or where we are proposing a different approach. For example, we have reduced pre-efficient plans for issues identified in unit cost calculations and made reductions to buildings, information management and R&D expenditure. We assess that Network Rail can achieve renewals efficiencies of 20.1% by the final year of the control period. We assess that Network Rail needs to spend £12,173m on renewals during CP5. This is £1,618m less than proposed in the SBP.

Enhancements

4.74 As we discussed above, our assessment of the efficient level of expenditure for enhancements is different from the approach taken for other costs. Firstly we looked

at whether the proposed projects were required to meet the HLOSs. We then scrutinised individual project costs and portfolio efficiency overlays.

4.75 Of the £12.4bn costs in Network Rail's SBP, there were about £3.2bn of costs for projects determined outside of the review (Thameslink, Crossrail, Borders and an element of EGIP[103]) and £1.3bn of costs for ring-fenced funds. We scrutinised the remaining £7.9bn which we reduced to £7.2bn, largely as a result of applying Network Rail's own efficiency overlay to more projects where it was reasonable to do so and reducing risk allowances where we concluded that the levels in cost estimates were too high.

4.76 Finally we added about £0.6bn into the settlement for: an assumed level of non-government funded schemes (to be consistent with our assessment of other single till income); extra Schedule 4 costs as a result of the recalibration of Schedule 8; and funding for research and development.

Package

4.77 In our 2003 determination, we assumed that Network Rail could achieve efficiency improvements of 31% by the end of CP3 (i.e. 2008-09) on its support, operations, maintenance and renewals costs. In our 2008-09 annual efficiency and finance assessment of Network Rail[104], we found that the company has achieved efficiencies of 27% in CP3.

4.78 In PR08, we assessed that the efficiency gap for Network Rail's support, operations, maintenance and renewals expenditure at the end of CP3 was 35%. In PR08, we set Network Rail's revenue requirement on the assumption that it could close around two thirds of this gap in CP4, i.e. achieve 21% efficiencies by the end of CP4. Given that Network Rail is now forecasting that it will achieve efficiencies of 18% in CP4, that means that the gap at the end of CP4, based on our PR08 analysis, would be 17%.

4.79 After fully considering our duties and Network Rail's capability to safely and sustainably deliver efficiency savings, we have decided that it is reasonable to assume that Network Rail will achieve the savings we have identified in five years, i.e. within CP5.

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[103] The Edinburgh to Glasgow Improvement Programme.

[104] The annual efficiency and finance assessment of Network Rail 2008-09 is available at: http://www.rail-reg.gov.uk/upload/pdf/404.pdf.

Overview of efficiency assumptions

4.80 Our determination of Network Rail's efficient expenditure reflects our assessment of both the expenditure-specific analysis and the cross-cutting issues discussed above.

4.81 Tables 4.3, 4.4 and 4.5 set out the efficiency assumptions that we have applied to Network Rail's support, operations, maintenance and renewals expenditure.

Table 4.3: Our assumptions on CP5 efficiency (Great Britain)

Expenditure	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Support	9.1%	4.9%	6.3%	3.4%	4.4%	25.2%
Operations	1.9%	2.9%	4.3%	4.2%	5.4%	17.4%
Maintenance	4.0%	3.4%	3.5%	3.4%	3.4%	16.5%
Renewals	8.2%	3.7%	4.2%	3.0%	2.8%	20.1%
Weighted average efficiency	**6.8%**	**3.7%**	**4.2%**	**3.2%**	**3.3%**	**19.6%**

Table 4.4: Our assumptions on CP5 efficiency (England & Wales)

Expenditure	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Support	9.1%	4.9%	6.3%	3.4%	4.3%	25.1%
Operations	2.0%	2.8%	4.3%	3.9%	5.5%	17.3%
Maintenance	4.0%	3.4%	3.5%	3.4%	3.5%	16.7%
Renewals	8.2%	3.7%	4.1%	3.0%	2.8%	20.1%
Weighted average efficiency	**6.7%**	**3.7%**	**4.2%**	**3.2%**	**3.3%**	**19.5%**

Table 4.5: Our assumptions on CP5 efficiency (Scotland)

Expenditure	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Support	9.6%	5.1%	6.2%	3.5%	4.6%	25.9%
Operations	1.3%	3.8%	3.8%	6.7%	4.1%	18.3%
Maintenance	3.8%	3.2%	3.3%	3.1%	3.1%	15.5%
Renewals	8.3%	3.4%	4.9%	2.9%	3.0%	20.7%
Weighted average efficiency	**6.8%**	**3.7%**	**4.5%**	**3.3%**	**3.3%**	**19.9%**

5. Support expenditure

Key messages in this chapter

- Support costs are mainly administrative costs that Network Rail incurs to deliver its outputs, such as costs related to finance, human resources and information management. However, this category also includes other running costs such as utilities costs and insurance.
- We have reviewed Network Rail's proposals and assessed them against a number of rail and non-rail benchmarks. We have seen some improvements in Network Rail's analysis compared to PR08.
- Network Rail's support functions have made progress in reducing costs during CP4. However, there are still inefficiencies to be addressed in CP5.
- We have determined Network Rail's total support costs to be £2,093m over CP5. This is £139m less than Network Rail forecast in its SBP and £647m less than Network Rail's CP4 costs (based on its PR13 SBP forecast).
- This represents a 20% efficiency improvement in Network Rail's core support costs (i.e. excluding group costs and other support functions). Network Rail assumed a 12% efficiency improvement.
- Our forecast of Network Rail's expenditure on support costs in our determination is 5.5% of Network Rail's total expenditure.
- Our assumptions in our advice to ministers for Network Rail's expenditure on support costs were a low of £1,833m and a high of £2,173m.

Structure of this chapter

5.1 This chapter is structured as follows:

(a) introduction to the chapter;

(b) description of support costs;

(c) Network Rail's proposal;

(d) our assessment; and

(e) our decisions.

Introduction

5.2 This chapter summarises our assessment of Network Rail's CP5 expenditure on its support functions.

Description of support costs

5.3 Network Rail's operating expenditure includes support costs, operations expenditure and industry costs and rates. In this chapter, we explain our assessment of Network Rail's support costs only. We cover operations costs and industry costs and rates in the next two chapters.

5.4 Support costs include expenditure on activities that 'support' Network Rail's business. These are mainly administrative costs, such as costs related to finance, human resources (HR) and information management. This category also includes other running costs such as utilities costs and insurance.

5.5 Some of Network Rail's support costs are 'recharged' to other parts of the business, i.e. they are included in operations, maintenance, renewals and enhancements expenditure. For its regulatory accounts and its SBP, these recharges are calculated in accordance with the rules set out in our regulatory accounting guidelines (RAGs)[105]. The figures we present in this chapter are shown after any recharges[106].

5.6 Since PR08, Network Rail has made a number of changes to its definition of support costs. For example, pensions and staff incentives costs are now charged to the rest of the business, e.g. operations instead of being held in support costs.

5.7 Support costs are an important part of Network Rail's overall revenue requirement, especially as they funded in the year they are incurred. Network Rail spent £477m (in 2012-13 prices) on support costs in 2011-12 (after recharges) and Network Rail's SBP assumed that support costs will be around 6% of its total support, operating, maintenance, renewals and enhancement expenditure in CP5, and around 8% of its projected gross revenue requirement.

[105] The RAGs are available at: http://www.rail-reg.gov.uk/server/show/nav.149.

[106] Network Rail presents its support costs data after recharges. We have used the same approach in presenting our analysis in our determination but we have analysed total support costs before recharges to other parts of Network Rail's business.

Network Rail's proposal

5.8 As part of PR13, Network Rail has generally produced more comprehensive analysis and supporting information than it did in PR08. For example, in support of its SBP, Network Rail has independently benchmarked (for example against external comparators) 95% of support costs across its corporate services (HR, finance, information management etc.) and has provided detailed function-by-function plans. This has given us a better view of Network Rail's costs and ultimately allows us to make more informed decisions.

5.9 However, Network Rail has not provided a satisfactory analysis of the reconciliation of its other operating income or its capitalisation of overheads (i.e. recharges to other areas of the business). We will do more work on other operating income in the summer and we discuss our approach to the capitalisation of overheads issue below.

5.10 In its SBP, Network Rail set out its plan to deliver a 24% reduction in its support costs over CP5[107]. This includes cost reductions by the final year of CP5 (compared to 2013-14 costs) of 12% in core support costs (including its accommodation costs).

5.11 Network Rail's cost savings are driven by a number of initiatives, including the development of a new operating model for its central functions, e.g. HR, which will allow it to more effectively support the frontline.

5.12 Table 5.1 sets out Network Rail's SBP assumptions of efficiency and total CP5 costs for its support functions.

Table 5.1: Network Rail's SBP forecast of support costs in CP5

£m (2012-13 prices)	Great Britain CP5 efficiency	Great Britain	England & Wales	Scotland
Human Resources	22.5%	273	245	27
Information Management	-10.4%	324	292	32
Government and Corporate Affairs	16.1%	86	77	9
Group Strategy	21.5%	53	48	5

[107] Network Rail's total savings in its SBP were presented as a comparison between the last year of CP5 and the last year of CP4 and did not adjust for atypical costs in the last year of CP4.

£m (2012-13 prices)	Great Britain CP5 efficiency	Great Britain	England & Wales	Scotland
Finance	16.3%	129	116	13
Business Services	20.8%	66	59	7
Accommodation	16.0%	339	319	20
Utilities	6.7%	186	168	19
Insurance	3.9%	259	233	26
Legal and Inquiry	5.1%	30	27	3
Safety and Sustainable Development	48.0%	39	35	4
Strategic Sourcing	27.5%	44	39	4
Business Change	23.7%	16	14	2
Other corporate functions	9.4%	16	14	2
Core support costs (excluding group)	12.3%	1,860	1,688	172
Asset Management Services	20.1%	205	184	20
Network Rail Telecom	41.3%	172	154	17
National Delivery Service	134.9%	7	7	1
Investment Projects	0.0%	0	0	0
Commercial property	168.4%	(19)	(18)	(1)
Support costs (excluding group)	**19.4%**	**2,224**	**2,015**	**209**
Group costs	88.0%	8	7	1
Support costs (including group)	**24.2%**	**2,232**	**2,022**	**210**

5.13 Network Rail's support costs include 'group costs'. These costs are usually large/one-off items or recharges to elsewhere in the company. We provide a breakdown of Network Rail's SBP forecast of CP5 group costs, consistent with the analysis above, in Table 5.2.

Table 5.2: Network Rail's SBP forecast of group costs in CP5

Group cost (£m 2012-13 prices)	CP5 total
Income from High Speed 1	(28)
Consultancy / legal / other	25
Project support recharges	(122)
Redundancy costs	100
Contingency	33
Total group costs	**8**

Our assessment

Overview

5.14 We have made an assessment of the efficient level of Network Rail's support costs in CP5. We have reviewed Network Rail's SBP and supporting evidence, commissioned external consultancy studies on certain areas of support costs as discussed below, and carried out our own analysis to support our assessment.

5.15 Our approach to assessing Network Rail's support costs was to

(a) select a base year (2013-14);

(b) adjust the base year to remove any atypical or inappropriate costs;

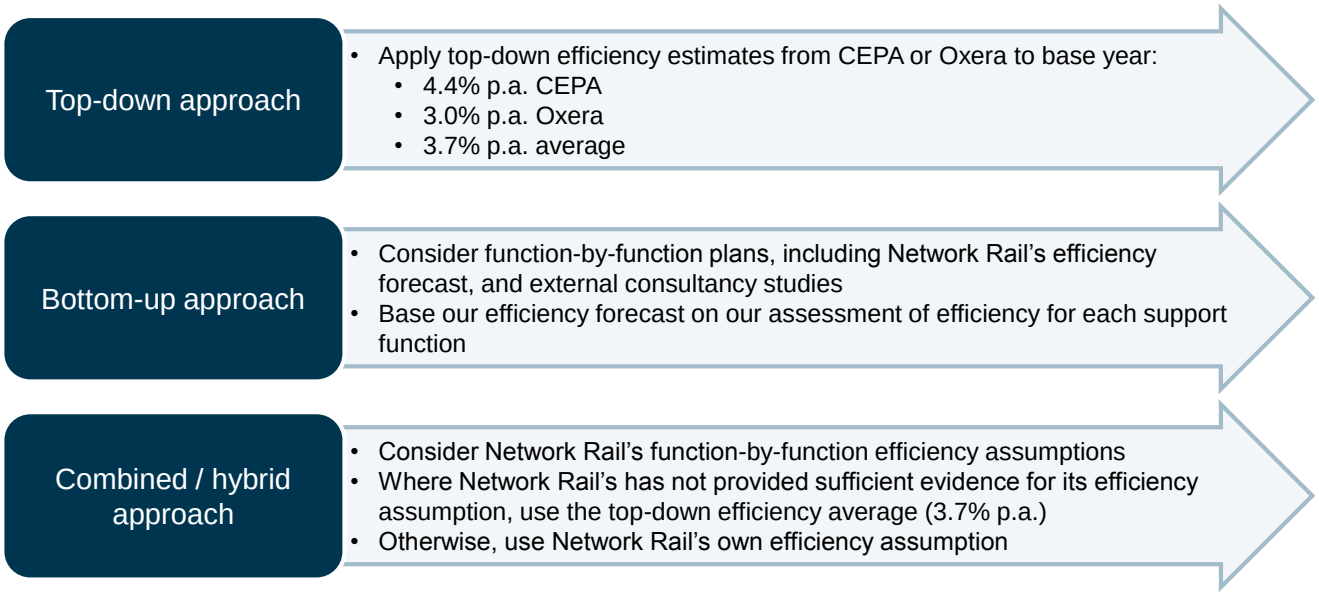
(c) roll forward the base year for each year of CP5 to give the pre-efficient costs;

(d) apply our own efficiency assumption to the pre-efficient costs; and

(e) decide between a bottom up efficiency assumption and a top down efficiency assumption.

5.16 Figure 5.1 sets out the three main options for determining Network Rail's efficient support costs in CP5.

Figure 5.1: Options for determining Network Rail's efficient support costs



5.17 We have based our assessment of Network Rail's CP5 support costs on the combined/hybrid approach. This means that where Network Rail has provided robust analysis of its functions' costs, we have used Network Rail's forecast of costs. However, where Network Rail has provided insufficient justification for its forecasts, we have applied a top-down efficiency assumption to our view of Network Rail's pre-efficient costs.

5.18 Our top-down efficiency assumption has been calculated by taking the average of CEPA's forecast of 4.4%[108] and Oxera's forecast of 3.1%[109]. We recognise that the use of a top-down efficiency assumption is subjective, so by taking this approach we have made our determination more robust.

Base year

5.19 In our assessment of Network Rail's support costs, we used Network Rail's latest forecast of 2013-14 expenditure as the basis of our analysis. However, in any one year, Network Rail may incur one-off costs or receive one-off income, e.g. fines. So that we could assess a representative year of expenditure, i.e. it is comparable to future years' spend, we have removed any significant one-off or 'atypical' costs (or

[108] We commissioned CEPA to produce a study on the scope for Network Rail to achieve efficiency gains in operations and support costs in CP5. This is available at: http://www.rail-reg.gov.uk/pr13/PDF/cepa-orr-om-productivity-over-cp5.pdf.

[109] Network Rail included in its SBP, a study by Oxera on the scope for efficiency improvements in Network Rail.

income) from the base year. We set out the adjustments that we have made later in this chapter.

Capitalisation (and recharges)

5.20 Network Rail's support functions provide services to other areas of the business where the costs of these activities are capitalised rather than expensed in the year, e.g. renewals expenditure.

5.21 As part of its SBP, Network Rail provided a high level reconciliation of transfers of support costs into renewals and enhancement costs, which we have reviewed. This analysis showed an additional capitalised cost of £62m in CP5, which was not consistent with its assumptions on support costs. Network Rail has not been able to adequately explain this inconsistency and the burden of proof is on it to show that its unit costs are appropriate and as we explain in the asset management: maintenance and renewals chapter (chapter 8), it has not done this. As a result, for our determination, we have deducted £62m from enhancement costs[110]. We have assumed that all capitalised costs are variable and so we have changed the costs that are included in capital expenditure in line with any reduction or increase in our underlying capital expenditure assumptions.

Our consultancy studies

Overview

5.22 Compared to PR08, we have completed a more wide ranging set of studies on support costs. These studies are summarised below and each study, or an executive summary of the study, is available on our website[111].

Top-down comparison of Network Rail's support & operations costs against other companies (CEPA)

5.23 The purpose of this study was to provide estimates of Network Rail's scope for achieving efficiency gains in operations and support costs over CP5. This study drew on the historical performance of other UK network industries and different sectors' productivity performance in order to determine the possible scope for efficiency gains. CEPA used the following methods to provide a range for the scope for efficiency

[110] This was a more straightforward way of making the adjustment than adjusting both renewals and enhancements expenditure.

[111] These studies are available at: http://www.rail-reg.gov.uk/pr13/publications/consultants-reports.php.

gains: Real Unit Operating Expenditure (RUOE); Total Factor Productivity (TFP); and Labour, Energy, Materials and Services cost measure (LEMS).

5.24 CEPA found that, subject to Network Rail delivering its CP4 targets, the average annual change in RUOE, of 4.4% (for comparator industries in their third price control[112]), and the LEMS cost measure for electricity, gas and water supply (11-15 years since privatisation), of 5.1%, respectively, could represent an appropriate annual target for each year of CP5. Savings of this order are consistent with broader studies of Network Rail's relative efficiency, e.g. the benchmarking work included in the RVfM study, which suggests that Network Rail's costs are significantly higher in a range of activities than those of its international peers[113].

International support and operations benchmarking (Civity)

5.25 We commissioned consultants, Civity, to benchmark Network Rail's support and operations expenditure against other railway infrastructure managers. The aim was to help us understand whether, and to what extent, there is a gap between the efficiency of Network Rail's support and operations expenditure and that of comparators (particularly the most efficient rail infrastructure managers). Civity's views on operations costs are included in the operations expenditure chapter (chapter 7).

5.26 For support costs, Civity found that, in relation to its peers (based on total expenditure, staff size, and labour costs), Network Rail's total expenditure on support functions (representing 8% of its total annual expenditure) is in the middle of the peer group. Civity also found that this was the case for individual support functions, with the exception of procurement, where Network Rail's position is at the higher end of the peer group. However, Civity did conclude that the current positioning of Network Rail relative to its peers cannot be used to draw reliable conclusions on Network Rail's efficiency and that further disaggregation of costs would be necessary to produce more reliable analysis. We think that this study has identified a number of useful

[112] CEPA based its assumptions on the third control period because it assumes that when Network Rail took over its responsibilities, the effect of Railtrack's problems had reset efficiency levels to the level at privatisation. Therefore, as CP5 is the third control period after Network Rail took over its responsibilities, CEPA's analysis was based on the efficiency levels in comparator industries in their third control period.

[113] These savings are similar to the analysis that Oxera carried out for us in PR08. Oxera's PR08 study is available at: http://www.rail-reg.gov.uk/upload/pdf/pr08-oxeraeffic-160408.pdf.

issues but we have not used it to inform our determination of support costs for CP5 due to the issues over data reliability highlighted by Civity.

Pace of change study (BDO/CEPA)

5.27 The purpose of the study was to develop a greater understanding of the potential pace of change of cost savings that Network Rail could achieve in its support functions over CP5. The study considered a number of companies and reviewed how they reacted to significant changes to their businesses, e.g. from mergers, regulatory change through a price control and changing markets. The study also sought to estimate Network Rail's fixed and variable support costs and determine how the split between fixed and variable costs can impact on a company's ability to react to a significant business change, e.g. a merger, acquisition or price control.

5.28 The study found that major change within other organisations can often be seen first in support costs, with significant cost reductions achievable within two to four years, although this was potentially more difficult to sustain in the long term. The study also found that where there is a significant business imperative, e.g. potential bankruptcy, the pace of change is at its most rapid and most extensive. When reflecting on Network Rail's current position, the report concluded that Network Rail's historic pace of change in support costs has been slow and steady and that there was scope to increase the speed at which Network Rail implements its change programmes.

Insurance costs (Willis)

5.29 We commissioned Willis (an insurance broker) to review Network Rail's proposed annual insurance costs for each year of CP5 to consider whether Network Rail's overall insurance strategy is appropriate and whether its proposed insurance costs are efficient, e.g. are there some risks that Network Rail could manage more efficiently than it is proposing?

5.30 Willis concluded that Network Rail's overall approach to insurance costs is efficient. However, it identified some aspects of its insurance cover where Network Rail may not take an efficient approach.

Network Rail studies

5.31 In support of the IIP, SBP and as part of progressive assurance, Network Rail has commissioned a number of external and internal studies. We have considered this analysis in our assessment of Network Rail's CP5 support costs.

5.32 These studies included:

(a) Hackett benchmarking of key support functions, e.g. HR;

(b) IPD workplace management benchmarking;

(c) Gartner study on information management; and

(d) Arup review of NDS.

Our decisions

Overview

5.33 In support of our assessment of Network Rail's support costs in CP5, we have considered:

(a) whether we need to make adjustments to base year costs;

(b) any implications of Network Rail's approach to capitalisation and recharging of support costs;

(c) the findings of the studies that we have commissioned to review different elements of Network Rail's support costs;

(d) the studies provided by Network Rail (both internal and external) in support of its IIP, progressive assurance and SBP;

(e) whether Network Rail has included any contingency within its forecasts and we have excluded contingency where relevant; and

(f) the additional overlay for Network Rail's management of inflation and occupational health.

Base year

5.34 We have reviewed Network Rail's SBP forecast of its expenditure of £554m on support costs in 2013-14. We have identified a number of one-off (or atypical) costs or costs that it is not appropriate to include in our assessment of CP5 support costs, e.g. fines, contingency, CP4 specific expenditure and a double-count with our other assumptions on Network Rail's expenditure in CP5 and have adjusted the base year for them.

5.35 These adjustments, resulting in a reduction in costs of £45m, include:

(a) a reduction in one-off incomes/costs in 2013-14 (£15m);

(b) a reduction in contingency (£26m) as we are not providing specific contingency for support costs in CP5 and Network Rail can use its balance sheet buffer to manage the risks involved with this expenditure;

(c) a reduction in CP4 funds (£11m), this is expenditure on the performance fund and the seven day railway fund in 2013-14), which is not needed in CP5;

(d) a reduction in insurance costs to reflect a double count of Schedule 4 & 8 costs (£3m);

(e) an increase in information management costs to reflect increase in support costs for the Traffic Management System (£5m) (Network Rail assumed £6m in its SBP); and

(f) an increase in utilities costs (£5m), to correct an error in Network Rail's forecast.

5.36 These adjustments result in an adjusted base year expenditure of £509m (as shown in Table 5.3), compared to Network Rail's SBP assumption of £554m.

Pace of change

5.37 We think that our assessment of Network Rail's support costs is challenging but achievable, when considered as part of the overall PR13 package. We can see from the BDO/CEPA study on the pace of change that there are examples of companies that have delivered significant cost savings within 18 to 24 months. However, given the overall challenge present in the overall PR13 package, we think that the speed of cost savings in this area is reasonable.

Efficient forecast of costs

5.38 On the basis of our assessment, we have assumed Network Rail's total support costs will be £2,093m over CP5. This is £139m less than Network Rail forecast in its SBP and £647m less than Network Rail's CP4 costs (based on its PR13 SBP forecast). This represents a 20% efficiency in Network Rail's core support costs (i.e. excluding group costs and other support functions).

5.39 Our forecast of Network Rail's expenditure on support costs in our determination is £2,093m, this is 5.5% of Network Rail's total expenditure and our advice to ministers assumptions for Network Rail's expenditure on support costs were a low of £1,833m and a high of £2,173m.

5.40 Tables 5.3, 5.4, 5.5, and 5.6 set out our efficiency assumptions for CP5 and the implied post-efficient level of support costs[114].

[114] The CP4 total is taken from Network Rail's SBP and is not adjusted for atypical costs.

Table 5.3: ORR assessment of CP5 support costs (Great Britain)

£m (2012-13 prices)	CP4	CP5					CP5
	2013-14[115]	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Human Resources	63	59	59	53	51	48	271
Information Management	64	61	59	57	54	52	283
Government and Corporate Affairs	20	18	18	17	17	16	85
Group Strategy	13	11	11	11	10	10	53
Finance	29	28	27	25	24	24	128
Business Services	16	14	13	13	13	12	65
Accommodation	77	72	72	65	65	63	337
Utilities	44	41	41	40	39	38	201
Insurance	50	48	46	44	43	41	222
Legal and Inquiry	6	6	6	5	5	5	27
Safety and Sustainable Development	13	10	8	7	7	7	39
Strategic Sourcing	11	10	9	9	8	8	43
Business Change	4	4	3	3	3	3	16
Other corporate functions	4	3	3	3	3	3	16
Core support costs (excluding group)	**412**	**385**	**375**	**353**	**343**	**331**	**1,786**
Efficiency	N/A	6.7%	2.6%	5.7%	3.0%	3.5%	19.8%
Asset Management Services	51	41	41	40	41	40	203
Network Rail Telecom	45	45	36	31	29	25	166
National Delivery Service	7	5	3	1	0	(2)	7
Investment Projects	0	0	0	0	0	0	0
Commercial property[116]	7	(3)	(3)	(4)	(5)	(5)	(20)
Support costs (excluding group)	**522**	**474**	**452**	**422**	**407**	**388**	**2,143**
Group costs	(13)	(11)	(12)	(10)	(9)	(7)	(50)
Support costs (including group)	**509**	**463**	**440**	**412**	**398**	**381**	**2,093**
Efficiency	N/A	9.1%	4.9%	6.3%	3.4%	4.4%	25.2%

[115] 2013-14 is an adjusted base year as described above, Network Rail's forecast for 2013-14 is £554m.

[116] Network Rail's SBP separates out its commercial property costs from its support costs. However, for our analysis we include commercial property costs within our support cost analysis.

Table 5.4: High level ORR assessment of CP5 support costs (Great Britain)

£m (2012-13 prices)	CP4		CP5				Total	
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	CP4*	CP5
Efficiency assumption	N/A	9.1%	4.9%	6.3%	3.4%	4.4%	N/A	**25.2%**
Post-efficient costs	509	463	440	412	398	381	2,740	**2,093**

* The CP4 total is taken from Network Rail's SBP and is not adjusted for atypical costs.

Table 5.5: High level ORR assessment of CP5 support costs (England & Wales)

£m (2012-13 prices)	CP4		CP5				Total	
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	CP4*	CP5
Efficiency assumption	N/A	9.1%	4.9%	6.3%	3.4%	4.3%	N/A	**25.1%**
Post-efficient costs	458	416	396	371	358	343	2,466	**1,884**

* The CP4 total is taken from Network Rail's SBP and is not adjusted for atypical costs.

Table 5.6: High level ORR assessment of CP5 support costs (Scotland)

£m (2012-13 prices)	CP4		CP5				Total	
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	CP4*	CP5
Efficiency assumption	N/A	9.6%	5.1%	6.2%	3.5%	4.6%	N/A	**25.9%**
Post-efficient costs	51	46	44	41	40	38	274	**209**

* The CP4 total is taken from Network Rail's SBP and is not adjusted for atypical costs.

6. Traction electricity, industry costs and rates

Key messages in this chapter

- We have updated Network Rail's forecast of traction electricity costs for the latest forecast of electricity prices in CP5. This has reduced the forecast of traction electricity costs in Great Britain by £524m in CP5 compared to Network Rail's SBP.
- We have reviewed Network Rail's proposals and we have concluded that efficiencies can be made in British Transport Police (BTP) costs. This has reduced the forecast of Network Rail's share of BTP costs in Great Britain by £26m in CP5 compared to Network Rail's SBP. Network Rail did not assume any efficiencies for these costs.
- Our forecast total expenditure on traction electricity, industry costs and rates in CP5 in our determination is £3,114m, which is 8.2% of Network Rail's total expenditure.
- Our assumptions in our advice to ministers were a low of £2,997m and a high of £3,378m.

Introduction

6.1 This chapter summarises Network Rail's proposals and our assessment of Network Rail's CP5 expenditure on traction electricity, industry costs and rates.

Definition of traction electricity, industry costs and rates

6.2 Network Rail's influence over the costs covered in this chapter varies as described in the financial framework chapter (chapter 12). Therefore, as was the case in PR08, each of these costs needs a bespoke treatment as discussed below. The costs include:

(a) traction electricity;

(b) business rates (i.e. cumulo rates);

(c) British Transport Police (BTP) costs;

(d) the Railway Safety and Standards Board (RSSB) levy;

(e) ORR licence fee and the railway safety levy; and

(f) other. This includes reporters' fees and Confidential Incident Reporting & Analysis System (CIRAS) fees.

Network Rail's proposals

6.3 Network Rail does not consider these costs to be fully controllable, with the exception of its own traction electricity costs. As such Network Rail's SBP did not include any efficiency assumptions for these costs. We have set out Network Rail's CP5 assumptions for Great Britain, England & Wales and Scotland in tables 6.1, 6.2 and 6.3.

Table 6.1: Network Rail's SBP CP5 traction electricity, industry costs and rates (Great Britain)

£m (2012-13 prices)	CP4		CP5				Total	
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	CP4	CP5[117]
Traction electricity	238	247	480	495	532	589	1,226	2,343
Business rates	151	149	149	150	168	172	577	787
British Transport Police	71	71	71	71	71	71	385	355
RSSB	9	9	9	8	8	8	46	41
ORR licence fee and railway safety levy	17	16	15	15	14	14	115	74
Other industry costs	5	5	5	5	5	5		24
Total	**491**	**496**	**729**	**743**	**798**	**858**	**2,349**	**3,624**

[117] In the executive summary of this document, we show total CP5 traction electricity, industry costs and rates of £3,701m. The additional £77m compared to Table 6.1 reflects costs that Network Rail included in its SBP for the maintenance of assets transferred from British Rail Residuary Board (£10m) and to reflect its estimate of the costs it could potentially incur from the asymmetry of the route-level efficiency benefit sharing (REBS) mechanism (£67m), i.e. although it may meet our efficiency assumptions in aggregate, underperformance in some routes and outperformance on others could lead to a net payment from Network Rail to train operators. We have included no funding for these issues in our determination as we think our package is deliverable by Network Rail and it would be inappropriate for us to assume ex-ante that Network Rail will underspend in some areas of the package and overspend in other areas. Also, our understanding was that the effect of the transfer of British Rail Residuary Board assets should be neutral for Network Rail.

Table 6.2: Network Rail's SBP CP5 traction electricity, industry costs and rates (England & Wales)

£m (2012-13 prices)	CP4		CP5				Total	
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	CP4	CP5
Traction electricity	224	232	447	461	498	553	1,158	2,192
Business rates	135	133	134	134	151	154	515	705
British Transport Police	66	64	64	64	64	64	348	320
RSSB	8	8	8	7	7	7	41	37
ORR licence fee and railway safety levy	19	14	13	13	12	12	100	64
Other industry costs		5	5	4	4	4		22
Total	**452**	**455**	**670**	**684**	**736**	**794**	**2,162**	**3,339**

Table 6.3: Network Rail's SBP CP5 traction electricity, industry costs and rates (Scotland)

£m (2012-13 prices)	CP4		CP5				Total	
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	CP4	CP5
Traction electricity	14	15	33	33	34	36	68	151
Business rates	16	16	16	16	18	18	62	82
British Transport Police	7	7	7	7	7	7	37	35
RSSB	1	1	1	1	1	1	5	4
ORR licence fee and railway safety levy	2	2	1	1	1	1	15	7
Other industry costs		1	0	0	0	0		2
Total	**40**	**40**	**58**	**59**	**62**	**63**	**187**	**282**

Our assessment

6.4 We have reviewed Network Rail's SBP submissions for industry costs and rates and considered the justification that it has provided us for its forecasts. As we set out in chapter 12, our approach to these costs is as follows:

(a) Network Rail's own use of traction electricity is controllable by Network Rail, so we have incentivised it to manage these costs efficiently;

(b) we think Network Rail can sufficiently influence the transmission losses element of traction electricity costs and the costs of BTP, RSSB and reporters, so we have incentivised Network Rail to aid the efficient management of BTP and RSSB costs and manage reporters costs efficiently;

(c) for business rates, as long as Network Rail can satisfy us that it has negotiated them efficiently, we will log-up/down any variations from the level we assumed in our determination and adjust Network Rail's allowed revenues in CP6; and

(d) we do not think that the costs of the ORR licence fee and railway safety levy and the other industry costs, e.g. CIRAS fees are sufficiently controllable by Network Rail, so we will log-up/down any variances in these costs between the assumptions in our determination and the outturns and the variances will be included in the opex memorandum account.

Overview of our analysis

Traction electricity

6.5 Network Rail recovers the vast majority of its traction electricity costs from train operators who require electricity to run their electrified train services. Network Rail also supplies traction electricity to third parties such as London Underground.

6.6 Network Rail does use a relatively small amount of traction electricity for supporting the operation of the railway, e.g. for signalling and at major stations such as London Euston. This costs approximately £10m per year.

6.7 Our review of traction electricity has taken place alongside our work on traction electricity charges. In the access charges chapter (chapter 16) we set out how we have calculated our forecast of traction electricity costs and how Network Rail is incentivised to manage efficiently transmission losses and its own use of traction electricity.

6.8 We are content with the general approach taken by Network Rail in calculating its forecast of traction electricity costs for CP5. However, its forecasts are underpinned by the Department of Energy and Climate Change (DECC) projections from 2011. More recent DECC data from October 2012 is now available and we have updated Network Rail's forecasts using that data as they are the most up to date projections available.

6.9 Using the latest DECC data has the effect of reducing the forecast of total traction costs in CP5 compared to Network Rail's forecast in its SBP of £524m. However, there is still a large amount of uncertainty over future electricity prices, so we will review our assumptions for the final determination. Table 6.4 sets out our determination of traction electricity costs for CP5.

Table 6.4: Our determination of traction electricity costs for CP5

£m (2012-13 prices)	CP4	CP5					Total	
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	CP4	CP5
Great Britain	238	247	345	378	399	452	1,226	1,819
England & Wales	224	232	321	352	373	424	1,158	1,702
Scotland	14	15	24	26	26	27	68	117

6.10 Overall our assumptions for traction electricity costs of £1,819m for Great Britain, £1,702m for England & Wales and £117m for Scotland are respectively lower than Network Rail's SBP forecast by £524m for Great Britain, £490m for England & Wales and £34m for Scotland[118].

Business rates (i.e. cumulo rates)

6.11 Network Rail's business rates are fixed in real terms for the first three years of the control period, as a result of the previous rating revaluation in 2010. The next rating revaluations for England, Wales and Scotland have been deferred by the governments and now will take effect in April 2017. Network Rail has provided an estimate of the potential revaluation and its effect on the business rates that it pays from 2017.

6.12 We have discussed these estimates with Network Rail and we think that they are probably too conservative. The estimates are by definition subjective and uncertain,

[118] Network Rail's forecasts in its SBP were £2,343m for Great Britain, £2,192m for England & Wales and £151m for Scotland.

so we will review our assumptions for our final determination. This will also allow us to discuss the estimates of business rates with Network Rail after it has had the opportunity to review our draft determination and its potential effect on its RAB, turnover and profit. This is because the forecast of these financial balances can affect the valuation of its network for rating purposes and hence the level of business rates in CP5. Table 6.5 sets out our determination of business rates for CP5.

Table 6.5: Our determination of business rates for CP5

£m (2012-13 prices)	CP4		CP5				Total	
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	CP4	CP5
Great Britain	151	149	149	149	172	197	577	815
England & Wales	135	133	133	133	154	176	515	729
Scotland	16	16	16	16	18	21	62	85

6.13 Overall our assumptions for business rates of £815m for Great Britain, £729m for England & Wales and £85m for Scotland are respectively higher than Network Rail's SBP forecast by £28m for Great Britain, £24m for England & Wales and £3m for Scotland[119]. This is because we corrected an error in Network Rail's assumptions.

British Transport Police costs

6.14 In support of our assessment of British Transport Police (BTP) costs, we have considered the following evidence:

(a) the Winsor report on the pay and conditions of police officers and staff, which outlined 121 recommendations designed to facilitate an efficient, well-resourced and highly skilled police service with a modern system of remuneration;

(b) the relevant sections of the Rail Value for Money study, which set out recommendations designed to deliver efficiency savings beyond those already planned by the British Transport Police Authority (BTPA). These included:

(i) the transfer of some of BTP's activities to other forces and the sharing of specialist functions and support activities;

(ii) extending efficiency opportunities, including a review of the staffing mix, merging HQ functions and revisions to rostering;

[119] Network Rail's forecasts in its SBP were £787m for Great Britain, £705m for England & Wales and £82m for Scotland.

(iii) local alignment with train operators and infrastructure managers, and a revised service specification procedure; and

(iv) major structural change, such as merging BTP with other forces in Great Britain in order to remove overhead costs, and

(c) discussions with Network Rail, BTP and BTPA, which indicated that there was scope to make improvements in efficiency. However, these initiatives have not been quantified.

6.15 After our consideration of this information and given that Network Rail has provided insufficient justification of its forecasts of these costs in its SBP, we have applied the top-down CEPA/Oxera average[120] to our view of Network Rail's pre-efficient costs (average 3.7% efficiency gain per annum, which equates to a 17.2% cumulative efficiency gain over CP5).

6.16 Table 6.6 sets out our determination of these costs for CP5 including the adjustment for efficiency.

Table 6.6 Our determination of British Transport Police costs for CP5

£m (2012-13 prices)	CP4		CP5				Total	
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	CP4	CP5
Great Britain	71	71	68	66	63	61	385	329
England & Wales	66	64	61	59	57	55	348	296
Scotland	7	7	7	7	6	6	37	33

6.17 Overall our assumptions for BTP costs of £329m for Great Britain, £296m for England & Wales and £33m for Scotland are respectively lower than Network Rail's SBP forecast by £26m for Great Britain, £24m for England & Wales and £2m for Scotland[121].

The Railway Safety and Standards Board (RSSB) levy

6.18 We have considered Network Rail's SBP submission for the RSSB levy in CP5. Network Rail has provided insufficient evidence of its forecasts for this area of cost and so we have taken Network Rail's forecast 2013-14 RSSB levy and applied the

[120] This is based on the average of two studies (CEPA 4.4% and OXERA 3.1%).

[121] Network Rail's forecasts in its SBP were £355m for Great Britain, £320m for England & Wales and £35m for Scotland.

top-down CEPA/Oxera average to this forecast (average 3.7% efficiency gain per annum).

ORR licence fee and the railway safety levy

6.19 We have taken the 2013-14 licence fee and safety levy and converted them into 2012-13 prices to be consistent with our determination. The licence fee is paid only by Network Rail whereas train operators contribute to the safety levy, based on their turnover. For our assessment we have allocated a proportion of the safety levy to Network Rail using our 2012-13 allocation because the 2013-14 allocation is not yet known. For our determination we have assumed Network Rail pays the same ORR licence fee and the railway safety levy in each year of CP5 (a combination of the licence fee and its share of the safety levy) as we have forecast for 2013-14.

Other

6.20 For the purpose of our draft determination we have used Network Rail's forecast in its SBP. However, we are reviewing our use of reporters[122] at the moment and will review the forecast for our final determination.

Summary

6.21 Our assumptions on traction electricity, industry costs and rates are summarised in Tables 6.7, 6.8 and 6.9.

[122] Independent reporters are consultancy firms that provide independent expert advice and are used by us to review some aspects of Network Rail's performance, plans and activities, e.g. its financial reporting. They owe a duty of care to both the ORR and Network Rail but Network Rail pays for their costs.

Table 6.7: Our assessment of CP5 traction electricity, industry costs and rates (Great Britain)

£m (2012-13 prices)	CP4		CP5				Total	
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	CP4	CP5
Traction electricity	238	247	345	378	399	452	1,226	1,819
Business rates	151	149	149	149	172	197	577	815
British Transport Police	71	71	68	66	63	61	385	329
RSSB	9	9	8	8	8	8	46	41
ORR licence fee and railway safety levy	17	17	17	17	17	17	115	86
Other industry costs	5	5	5	5	5	5		24
Total	**491**	**497**	**592**	**622**	**664**	**739**	**2,349**	**3,114**

6.22 Overall our assumptions for traction electricity, industry costs and rates of £3,114m in CP5 for Great Britain is £510m lower than Network Rail's forecast of £3,624m in its SBP. This is largely due to a reduction in traction electricity costs of £524m as we have used a more up to date forecast of electricity prices than Network Rail.

6.23 Our forecast total expenditure on traction electricity, industry costs and rates in CP5 in our determination is £3,114m for Great Britain, which is 8.2% of Network Rail's total expenditure and our advice to ministers assumptions were a low of £2,997m and a high of £3,378m.

Table 6.8: Our assessment of CP5 traction electricity, industry costs and rates (England & Wales)

£m (2012-13 prices)	CP4	CP5					Total	
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	CP4	CP5
Traction electricity	224	232	321	352	373	424	1,158	1,702
Business rates	135	133	133	133	154	176	515	729
British Transport Police	66	64	61	59	57	55	348	296
RSSB	8	8	8	7	7	7	41	37
ORR licence fee and railway safety levy	19	16	16	16	16	16	100	78
Other industry costs		5	5	4	4	4		22
Total	**452**	**457**	**543**	**572**	**611**	**682**	**2,162**	**2,864**

6.24 Overall our assumptions for traction electricity, industry costs and rates of £2,864m in CP5 for England & Wales is £475m lower than Network Rail's forecast of £3,339m in its SBP. This is largely due to a reduction in traction electricity costs of £490m as we have used a more up to date forecast of electricity prices than Network Rail.

Table 6.9: Our assessment of CP5 traction electricity, industry costs and rates (Scotland)

£m (2012-13 prices)	CP4	CP5					Total	
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	CP4	CP5
Traction electricity	14	15	24	26	26	27	68	117
Business rates	16	16	16	16	18	21	62	85
British Transport Police	7	7	7	7	6	6	37	33
RSSB	1	1	1	1	1	1	5	4
ORR licence fee and railway safety levy	2	2	2	2	2	2	15	8
Other industry costs		1	0	0	0	0		2
Total	**40**	**41**	**49**	**51**	**53**	**57**	**187**	**250**

6.25 Overall our assumptions for traction electricity, industry costs and rates of £250m in CP5 for Scotland is £32m lower than Network Rail's forecast of £282m in its SBP. This

is largely due to a reduction in traction electricity costs of £34m as we have used a more up to date forecast of electricity prices than Network Rail.

7. Operations expenditure

Key messages in this chapter

- Operations costs are those incurred in 'operating' the infrastructure such as for signallers and control staff. Network Rail's main proposal in this area is to implement a new way to run its infrastructure, often referred to as the Network Operating Strategy (NOS).
- The operational benefits of this strategy have the potential to be wide ranging, including reduced safety risk and better management of disruption, with the latter meaning that passengers and freight users should have shorter delays and more accurate information when things go wrong. It should also result in lower costs as fewer posts will be needed.
- We have reviewed Network Rail's proposals against domestic and European benchmarks. We have also conducted our own assessment of whether the strategy can deliver the proposed benefits.
- Network Rail will compare favourably with international benchmarks once the strategy is implemented. The company is at an early stage but the timescales are underpinned by a sensible rationale and consistent with other infrastructure companies that have done something similar. However, the level of efficiency for activities outside signalling are below benchmarks with other UK regulated industries and we think this can be improved.
- We have assumed that approximately £2bn of expenditure is required for CP5 with a cumulative efficiency of 17% in England & Wales and 18% in Scotland, which is an increase from the SBP of four percentage points in England & Wales and three percentage points in Scotland, to bring it in line with domestic benchmarks. We think Network Rail can achieve this through, amongst other things, better management of inflation and better management of occupational health.

Introduction

7.1 Network Rail has started to implement a long-term operating strategy that is introducing modern technology to operate the rail network more efficiently. It will centralise control so that more signals can be operated by fewer people and at fewer

locations. Staff involved in different aspects of operating the railway will be based in the same location and, in many cases, this will be alongside train operators. This will facilitate closer co-operation and in times of disruption allow better joint decisions about managing the train service. For example, better technology and wider coverage of control will help staff to reduce the knock on effects caused by an incident and quickly get services back up and running. In addition to improved reliability the new technology will help Network Rail to plan capacity better meaning that more trains could be introduced. Passengers should also receive better and more timely information about their journey.

7.2 To make this happen, signals need to be controlled remotely which requires widespread deployment of advanced signalling technology across the network. This is planned to be done alongside other renewals, but in order to deliver the strategy an increase in the volume of signalling work of around 20%[123] is needed in CP5. Alongside this signalling work Network Rail plans to centralise staff into 14 new operating centres (Figure 7.1) and introduce modern systems to manage train movements. A number of new centres will be built and a new system to manage traffic will be introduced. Eight of the proposed centres have already been built with the remainder due to be completed over the next two years. All of this combines to allow Network Rail to progressively change the way it operates the network over the next 15 years. It will be done in stages as signalling control is activated at the new centres and staff relocate to them.

7.3 The costs of this work are spread around Network Rail's business, for example updating signalling is part of the signalling renewals expenditure. Both the costs and benefits will influence other elements of the settlement, such as volumes of signalling renewals and levels of train service reliability. These are considered in the relevant chapters of this draft determination.

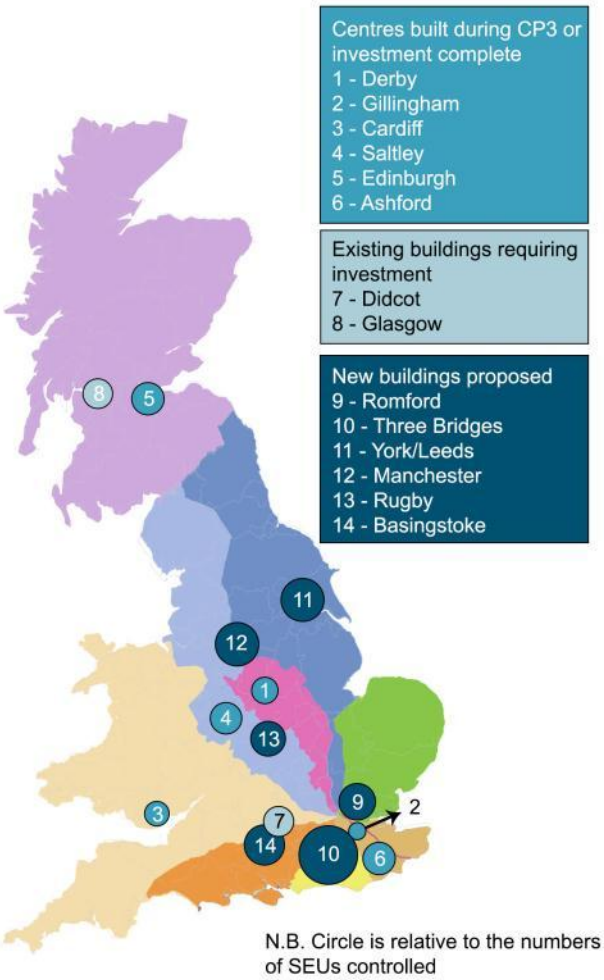
7.4 The main financial benefit will be lower operations expenditure as fewer posts will be required to manage the network. This chapter explains our examination of the operating strategy and presents our conclusions on assumed levels of efficient operations expenditure required for CP5.

[123] As set out in Network Rail's business case supplied in support of the SBP.

7.5 Approximately 70%[124] of operations costs are affected by the operating strategy. We have assessed all operations costs but with a particular focus on those affected by the strategy.

7.6 From our previous consultations it is clear that the industry is broadly supportive of the strategy, although it is at an early stage and several parties have expressed caution. The RMT set out general opposition to various elements of the SBP, including the operations strategy. Network Rail is working with the main unions in developing the strategy and we explain in chapter 11 our conclusion that there is nothing in the determination that prevents Network Rail complying with Health and Safety law.

Figure 7.1: New operating centres proposed in the SBP*



[124] From the costs supplied by Network Rail proposed signaller costs for CP5 are £1,365m from a total of £2,027m.

* SEUs are the signalling equivalent units which can be used as way of illustrating the span of control for each operating centre

Description of operations costs

7.7 Operations costs include expenditure on activities that 'operate' the infrastructure to allow trains to run such as signalling, timetabling and managing disruption. Costs are broadly categorised as:

(a) 'signaller', including signallers, level crossing keepers, controllers and electrical control room operators, which are affected by the operations strategy; and

(b) 'non-signaller', including staff on the ground managing disruption, staff in the managed stations, teams attributing delays and those dealing with customer relations, which are directly affected by the operations strategy.

7.8 The SBP identified an additional category 'Central Network Operations', which include centralised functions such as timetable management and performance management. For our assessment we have considered these with the non-signaller costs and refer to them as such.

Network Rail's proposals

7.9 The SBP sets out Network Rail's operations expenditure for CP5. Some maintenance costs, such as maintenance at stations, were included because they are costs managed by the operations function. Because of the way we have assessed the level of efficient expenditure we have removed maintenance costs from our operations assessment and included them in our maintenance assessment.

Table 7.1: Summary of Network Rail's SBP proposal for GB expenditure (with maintenance costs)

£m (2012-13 prices)	CP4			CP5			CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Pre-efficient expenditure	439	439	439	439	439	439	-	2,195
Annual efficiency	-	0.9%	2.1%	3.5%	2.9%	4.0%	-	12.8%
Post-efficient expenditure	439	435	426	411	399	383	2,239*	2,054

* Taken from appendix 9 of the SBP databook which updates actual and forecast expenditure in CP4 and replaces the delivery plan update.

Table 7.2: Summary of Network Rail's SBP proposal for GB expenditure (without maintenance costs)

£m (2012-13 prices)	CP4			CP5			CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Pre-efficient expenditure	433	433	433	433	433	433	-	2,165
Annual efficiency	-	0.7%	2.1%	3.6%	3.2%	4.1%	-	12.9%
Post-efficient expenditure	433	430	421	406	393	377	2,239*	2,027

* Taken from appendix 9 of the SBP databook which updates actual and forecast expenditure in CP4 and replaces the delivery plan update.

Signaller costs

7.10 Reductions in signaller costs will happen when existing signalling control is transferred to the new centres as part of the operating strategy. While Network Rail has started to implement some of the elements needed, there remain a number of key dependencies affecting the rate of change, such as: the ability of Network Rail and its supply chain to complete the required signalling renewals; and the company's approach to redeployment and redundancy in consultation with the trade unions. Network Rail has devised a programme for staffing the operating centres that it considers is the most efficient approach taking account the constraints. This

programme drives the rate of cost reductions and consequently the levels of efficiency it can achieve in CP5.

7.11 The strategy will be delivered by many different parts of Network Rail and is coordinated centrally. The specific reductions in signaller costs will be delivered by each of the routes and were set out in the route plans.

Non-signaller costs

7.12 Costs for the non-signaller activities in the routes remain broadly static in CP5 but there is a small efficiency saving on costs related to Network Operations HQ activities. This will mainly be the result of an initiative to improve the way Network Rail plans access and possessions.

Benchmarking

7.13 In developing its plans Network Rail carried out some work to benchmark the operational cost of running the railway infrastructure in Great Britain against other European railway operators. We reviewed[125] this work and found that the task was approached thoroughly but there were a number of areas that could be strengthened, particularly around including non-signaller costs in the benchmarking, as well as considering internal comparisons of its own routes. Network Rail responded positively to these recommendations and revised its work accordingly. The revised findings were inconclusive but indicated that Network Rail is not currently at the frontier in terms of operations expenditure but implementing the operations strategy would take it closer.

Progressive assurance

7.14 We put in place a number of assurance meetings in the period running up to the SBP and Network Rail worked openly and constructively. As a result the information provided in support of the SBP was in the format and to the level of detail that we required for our assessment.

Our assessment

7.15 Network Rail's plans set out a new way to run its infrastructure. We reviewed this to determine efficient levels of expenditure required for CP5. We tested different aspects

[125] Network Rail bottom up benchmarking review: benchmarking of operations costs: final report – executive summary, March 2012, available at: http://www.rail-reg.gov.uk/pr13/PDF/arup-operations-costs-benchmarking-020312.pdf.

of its proposals and commissioned our own work from which to draw conclusions. We removed the maintenance costs for the purposes of our assessment to avoid double counting with our review of maintenance expenditure explained in chapter 8.

Review of the operations strategy economic case

7.16 In our advice to the Secretary of State and Scottish Ministers we reviewed the initial business case and concluded that the rationale was sound. We told Network Rail to update the business case for the SBP submission and reformat it to take into account the strategic, financial, commercial and management cases as well as the economic case. Whilst the business case is GB wide the elements within it are disaggregated for Scotland and England & Wales. We checked the way that the economic appraisal had been calculated against standard industry practices (webTAG in England & Wales and STAG in Scotland) and concluded that the revised case still provides good value for money in both Scotland and England & Wales, with both countries having a benefit cost ratio of 3:1.

Review of the operations strategy management case

7.17 Using our Rail Management Maturity Model (RM3)[126] we evaluated the capability of Network Rail to deliver the operating strategy and associated reduction in headcount. An ORR team of experts was used who have experience of applying this model to the safety management of a number of rail industry organisations. A five point scale was applied to a number of categories based on the team's judgement of the evidence collected. Further detail on the evaluation criteria can be found on our website[127].

7.18 We found areas where we considered there was the potential to deliver excellence (level 5), in particular, governance, monitoring and review. Other areas were considered to be predictable (level 4) or standardised (level 3) with none at levels 1 or 2. These are summarised in Figure 7.2. We concluded that if performance in the excellent areas is maintained and improvements made in the other areas then the systems are capable of allowing successful delivery of the operating strategy programme. We also concluded that the way the programme has been planned and the systems developed offers Network Rail examples of excellence which should be shared through the organisation.

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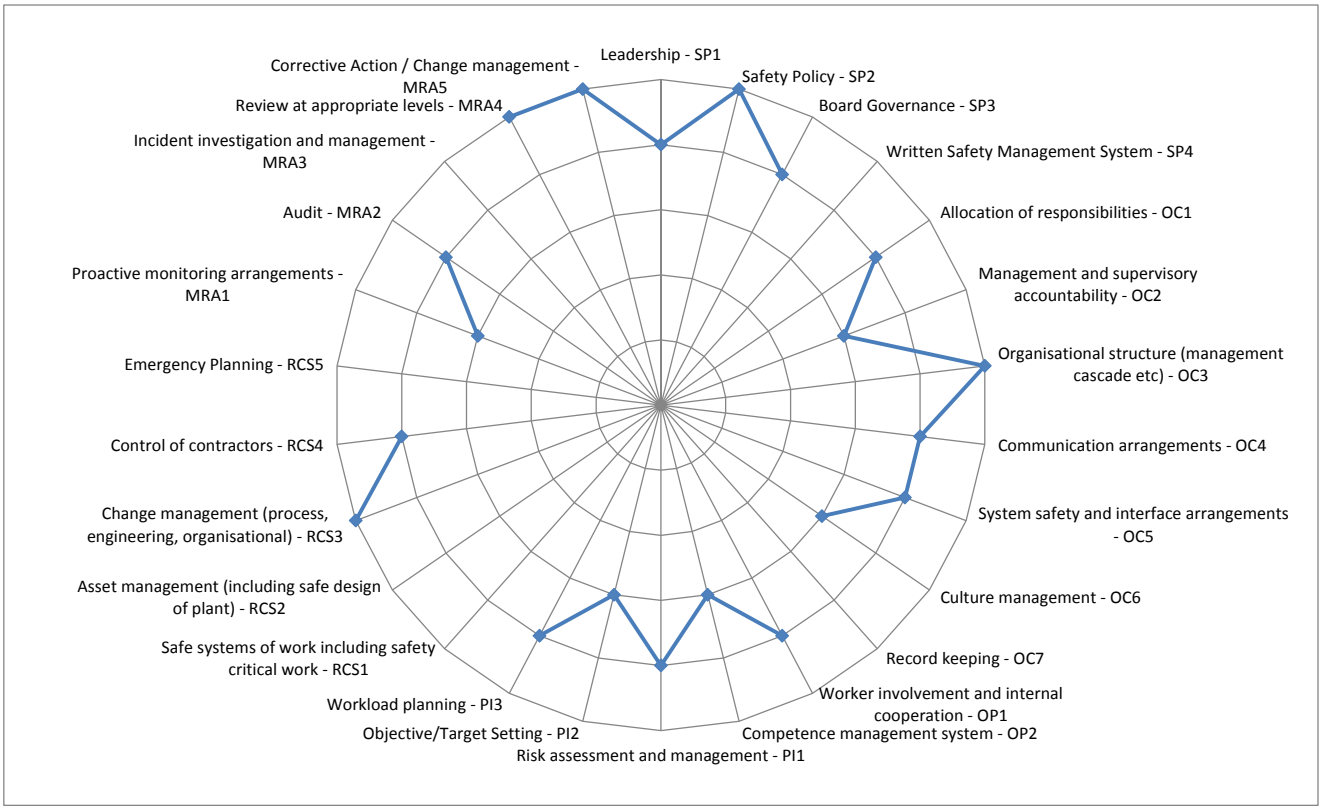
[126] http://www.rail-reg.gov.uk/pr13/PDF/nr-rm3-evaluation-sep2012.pdf.

[127] http://www.rail-reg.gov.uk/upload/pdf/management-maturity-model.pdf.

Figure 7.2: Summary of our RM3 assessment (the outside of the wheel is level 5 excellent)



Review of CP4 signalling volumes

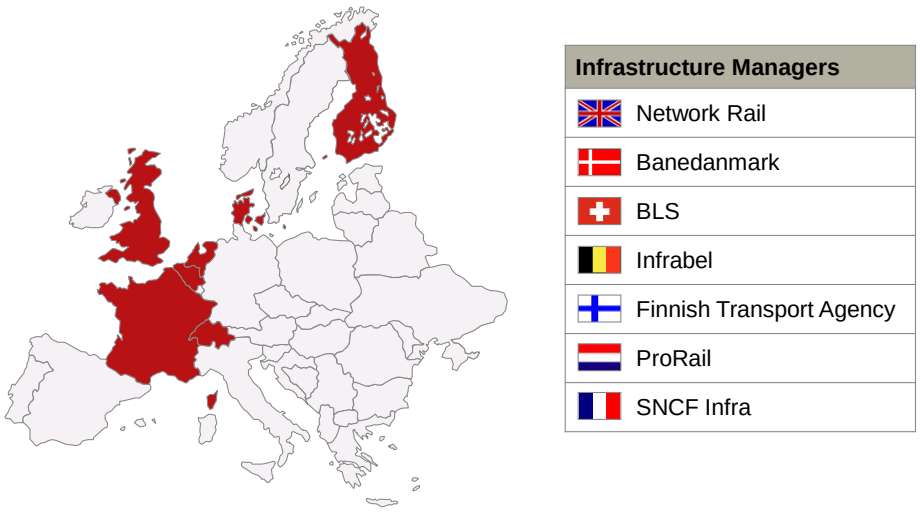
7.19 The main constraint in delivering the strategy is the rate at which the volume of signalling renewals can be done with Network Rail's own resources and those of its supply chain. It has devised a programme that accelerates signal renewals to align them with plans to migrate staff to the new control centres. Network Rail is broadly on course to deliver its CP4 volumes, although there is a peak of work required over the next year. For CP5 the total amount of work will almost double and, in CP4, testers[128] have been a scarce resource. Wherever possible, Network Rail has smoothed the profile and identified the times when it expects testers to be in short supply. Further explanation of our analysis of signalling volumes is set out in the renewals section of chapter 8.

[128] These are staff required to check that new or renewed signals function as designed and in a safe way.

International benchmarks

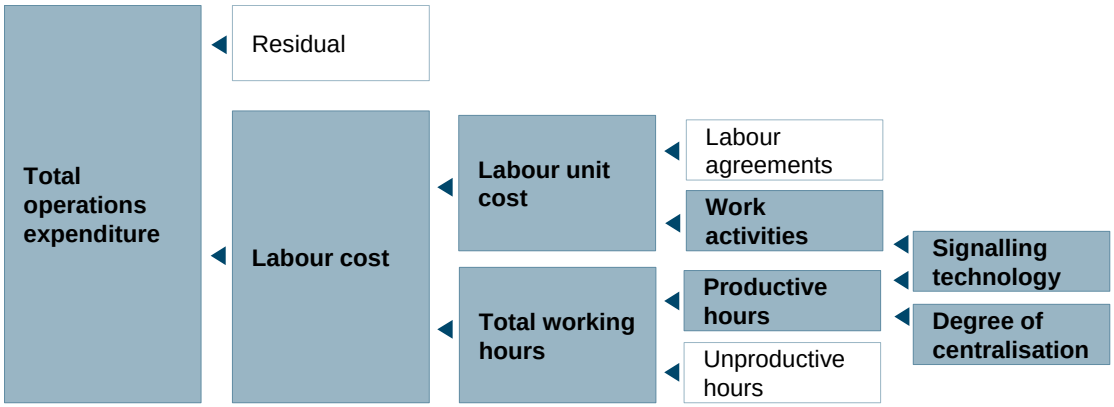
7.20 Network Rail's own work on benchmarking was inconclusive, although we acknowledge the difficulties around benchmarking operations costs. We commissioned the management consultants Civity to benchmark Network Rail's operations (and support) costs against other European railway infrastructure managers to see how they compare. This work was designed to build upon Network Rail's own work and other analysis done for the Rail Value for Money study. It looked at total operations costs, i.e. both signaller and non-signaller.

Figure 7.3: European comparisons used in the Civity review



7.21 Six peers agreed to take part in the study and provided comparable data, shown in Figure 7.3. From this data Civity concluded that most programmes that are similar to Network Rail's operating strategy take 15-20 years to implement. The analysis also showed that on completion of the operating strategy Network Rail would be at a leading position compared to this peer group in terms of cost efficiency. Figure 7.4 shows the areas that Civity analysed to inform its conclusions.

Figure 7.4: Scope of the Civity review



Comparisons with UK regulated industries on catch up and frontier shift

7.22 In March 2012, we published a report[129] by CEPA on the assessment of the scope for efficiency improvements based on comparisons with other UK regulated industries. This concluded that an appropriate annual target for CP5 would be 4.4% per annum for both support and operations costs. Network Rail completed its own review of this study using OXERA and included the findings alongside its SBP submission, which was a central estimate of 3% per annum. As we set out in chapter 6 (support expenditure), we have decided to use the average of these two studies as our top-down efficiency assumption.

Table 7.3: Comparisons of Network Rail's SBP cost efficiencies with other UK regulated industries

GB (2012-13 prices)	End CP4 (2013-14)	End CP5 (2018-19)	Cumulative Efficiency
Mid-point between CEPA and OXERA analysis			**17%**
Signaller costs in SBP	£298m	£246m	17%
Non signaller costs in SBP	£135m	£131m	3%

Our conclusions

7.23 Table 7.4 summarises our conclusions on the assumed level of efficient operations expenditure for Great Britain. We have assumed that approximately £2bn of expenditure is required for CP5 with a cumulative efficiency of 17% in England &

[129] http://www.rail-reg.gov.uk/pr13/PDF/cepa-orr-om-productivity-over-cp5.pdf

Wales and 18% in Scotland, which is an increase from the SBP of four percentage points in England & Wales and three percentage points in Scotland.

Table 7.4: Summary of our assumptions for operations expenditure – Great Britain

£m (2012-13 prices)	SBP	ORR determination	Difference
Signaller expenditure	1,366	1,366	0
Non signaller expenditure	661	606	-55
Overlay for cross cutting issues	-	-4	-4
Total	**2,027**	**1,968**	**-59**

Signaller expenditure

7.24 Network Rail is at the start of its programme to change the way it operates the network. We have reviewed the business case and concluded that it represents value for money.

7.25 We agree with the international benchmarking analysis showing that, compared to a group of European peers, Network Rail will be at a leading position once the strategy is completed in terms of costs and staff productivity.

7.26 We looked at whether Network Rail had the right approach to deliver the strategy. Using our own management maturity model we concluded that the current management arrangements should lead to successful delivery. However, the programme is at an early stage and there are risks from introducing new technology that need to be managed. Whilst not a regulated output, progress will be an important issue for PR18 and we have decided to monitor this throughout the control period. We have also decided that Network Rail should report on progress in its Annual Return.

7.27 We considered whether there was scope to accelerate the programme and therefore bring about more cost savings earlier. In comparing Network Rail to its European peers we found that the expected time span to deliver the strategy is in line with other countries that have embarked on something similar. We also looked at the high level programme where the main constraint is Network Rail's ability to deliver signalling renewals and re-control and have concluded that, at this stage, these cannot be accelerated any further. However, as the overall strategy will continue into CP6 and CP7 we will revisit this in the next periodic review when the programme will have matured and Network Rail has learnt from its experiences.

Non signaller expenditure

7.28 Compared to other regulated industries within the UK we have concluded that the level of efficiency for non-signaller expenditure can be improved, so we applied our top-down efficiency assumption to these costs.

Cross cutting issues

7.29 In addition we also think that Network Rail can make savings from cross cutting issues explained in chapter 4, i.e. better management of inflation and better management of occupational health.

Comparisons with RVfM and advice to ministers documents

7.30 The RVfM study examined the operating strategy and concluded that it was an opportunity to improve VfM. It did not make any additional recommendations in this area and did not include any further cost reductions in its calculations over and above those delivered by the strategy.

7.31 In comparison to our advice to minsters documents our assumptions on total expenditure is about 1% above the range we set out for Great Britain, with costs in Scotland 2% below the range and costs in England & Wales 2% above it. This is largely because the pre-efficient expenditure in the SBP, i.e. the 'starting point' from which to apply efficiency, was much higher than the IIP for England & Wales. Our assumed level of cumulative efficiency is in the middle of our initial range in England & Wales (which was 11% to 21%) and significantly above the range in Scotland (which was 3% to 8%).

Great Britain

Table 7.5: Summary of our assumptions for operations expenditure – Great Britain

£m (2012-13 prices)	CP4		CP5				CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Pre-efficient expenditure	433	433	433	433	433	433	-	2,165
Annual efficiency	-	2%	3%	4%	4%	5%	-	17%
Post-efficient expenditure	433	425	412	395	378	358	2,239	1,968

England & Wales

Table 7.6: Summary of our assumptions for operations expenditure – England & Wales

£m (2012-13 prices)	CP4		CP5				CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Pre-efficient expenditure	393	393	393	393	393	393	-	1,965
Annual efficiency	-	2%	3%	4%	4%	6%	-	17%
Post-efficient expenditure	393	385	374	358	344	325	2,034	1,787

Scotland

Table 7.7: Summary of our assumptions for operations expenditure – Scotland

£m (2012-13 prices)	CP4		CP5				CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Pre-efficient expenditure	40	40	40	40	40	40	-	200
Annual efficiency	-	1%	4%	4%	7%	4%	-	18%
Post-efficient expenditure	40	39	38	37	34	33	205	181

8. Asset management: maintenance and renewals expenditure

Key messages in this chapter

- This chapter covers our assessment of Network Rail's plans for managing its assets, for example its plans for maintaining and renewing track.
- How Network Rail manages its assets is closely linked to the safety of the railways, and will have a major impact on what outputs it can deliver and at what cost not only in the next 5 years but over the longer term.
- The costs associated with maintaining and renewing assets make up approximately 45% of Network Rail's total expenditure requirements in CP5.
- We, supported by the independent reporters, have carried out a comprehensive review of Network Rail's plan including the quality of its inputs (for example, asset base and cost information), its asset management approach (for example, its asset policies), its planned efficiency and its planned volumes, costs and outputs. We have also conducted our own international efficiency and benchmarking studies, looking at working practice and cost comparisons.
- Network Rail's maintenance and renewal plans are an improvement over PR08. The asset policies set a clearer direction in terms of what work needs doing, why and where.
- Plans have been submitted for each of Network Rail's ten operating routes. They have been produced by a process of challenge between the centre and routes which has resulted in better plans than would otherwise have been available.
- But there are areas of weakness which cut across the whole approach. For example: asset information management requires improvement; asset policies have not considered trade-offs between asset types; whole life costing analysis is crucially important and needs strengthening by improving its inputs (unit costs and understanding of degradation); Network Rail has more to do to understand how its asset management links to the delivery of high level outputs such as performance; and policies are weaker in defining the maintenance interventions and intervals required.

- Because Network Rail's knowledge of its civils assets and some aspects of its electrification and drainage assets is poor, there is higher uncertainty in parts of its plans.
- **Maintenance**
- Maintenance work is crucial to safety and performance on the network. Plans should be built on a strong understanding of what work needs to be done (for example, the miles of track to be inspected). This can then be priced using current understanding of the costs of carrying out work and the future reductions in cost because of improved efficiency.
- But Network Rail has built its plans by projecting forwards its current resource requirements, with adjustments for the changing network and improved efficiency. It has not clearly demonstrated that its plans are linked to the work required. This means that line of sight to its policies and the outputs that the company needs to deliver, is weak.
- Our analysis finds that, over CP5, maintenance efficiencies of 10.4% are achievable, compared with 9.8% assumed by Network Rail. The higher efficiency is driven by better management of resource. We have assumed a different profile of efficiency, giving 16.5% efficiency by the final year of CP5, compared with 13.7% assumed by Network Rail. We do not believe savings can be made beyond 16.5%, partly because of our concern about how rapidly Network Rail can introduce changes without potentially compromising safety or performance.
- Overall we assess that Network Rail needs to spend £5.2bn on maintenance during CP5, £92m less than proposed in the SBP.
- This means that Network Rail will have to implement changes to its practices, such as carrying out more automated inspections, making sure the right work is done at the right location at the first visit and making sure that working arrangements allow most productive use of time.
- **Renewals**
- Network Rail's renewal plans have, in general, a strong linkage to asset policies. They are built on a combination of workbanks in the shorter-term and modelled volumes in the longer term.
- Some key national programmes of work have been proposed to deliver long-term improvements and efficiencies, and we support these. They include the Network Operation Strategy (NOS) to centralise signalling and electrical control, a programme

to update the signalling system (by moving to the European Rail Traffic Management System (ERTMS)), and programmes aimed at improving asset management capability through improved asset information management (ORBIS), improved buildings and civils management (BCAM) and wider adoption of best practice asset management.

- Network Rail has conducted benchmarking to support its efficiency plans. This included a programme of international benchmarking of engineering practice which is far more extensive than it has ever previously carried out.
- But there are weaknesses in Network Rail's proposals. Its calculation of its current unit costs contains some errors and makes allowances for risk and contingency which are likely to be overestimated or duplicated. For buildings the proposed level of expenditure before efficiencies is not justified. For civils there are wide ranging issues that need to be addressed to produce a robust plan.
- Our analysis finds that, over CP5, renewals efficiencies of 14.7% are achievable, compared with 12.5% assumed by Network Rail. Our analysis finds that efficiencies of 20.1% are achievable by the final year of CP5, whereas Network Rail has proposed equivalent efficiencies of 15.7%. We have assumed greater opportunities from improved management of possessions, improved management of the supply chain, improved asset management systems, better targeting of work and adoption of innovative renewals practices.
- Overall we assess that Network Rail needs to spend £12.2bn on renewals during CP5. This is £1.6bn less than proposed in the SBP.
- Network Rail's management of its civil engineering assets (such as bridges and tunnels) has been a long-running issue. In 2010 concerns about its approach led to us and Network Rail commissioning Arup to carry out a fundamental review. Arup found widespread issues and made recommendations, for example, to improve asset policies, asset information, assessment of risk and resources. The company has started to make significant improvements and this is reflected in its proposed CP5 policies. However, there remains a lot more to be done. It has not presented a complete or consistent set of plans, some parts of the plans were submitted late and they contained many errors.
- Network Rail proposed expenditure of £2.6bn on civils renewals during CP5, whereas we have assessed expenditure required to be £2.4bn. However, there is high uncertainty around the civils plans and we agree with Network Rail that civils should

be dealt with differently. Recognising that the volume of work needs to increase we will provide increased funding (compared to CP4) for the first two years of CP5 where plans are relatively better. For years 3, 4 and 5 of the period we have assumed an increased level of expenditure but actual funding will be assessed by the 'civils funding mechanism' which requires Network Rail to submit further plans in the first year of CP5. This will allow both what work is planned and the efficiency of that work to be checked and adjusted accordingly.

Introduction

8.1 It is very important that Network Rail is capable of managing its assets effectively, including planning and delivering appropriate maintenance and renewal works. Effective asset management helps to deliver a safe, efficient railway which delivers the outcomes that stakeholders want, both now and in the future.

8.2 Our PR13 work has reviewed many aspects of Network Rail's asset management in great detail. We have assessed its development of asset management plans, from the definition of high level strategy, through development of asset policies to the planning of maintenance and renewal work in the routes. We have assessed the inputs to its plans: the asset information and understanding of costs that underpins them. We have also taken account of the company's delivery of work during CP4.

8.3 This chapter starts by giving a summary of Network Rail's CP5 plans for maintaining and renewing its assets safely, including:

(a) an overview of its asset management plans, including its planned asset management capability improvements, key asset management programmes of work and new asset policies;

(b) an overview of its process for development of planned volumes and expenditure; and

(c) a summary of its projected volumes and costs to maintain and renew the network, and forecasts of measures to demonstrate what the work delivers.

8.4 The chapter then presents our assessment of Network Rail's plans, including:

(a) our approach to the assessment of efficient maintenance and renewal expenditure;

(b) our assessment of each of the building blocks of Network Rail's maintenance and renewals plans;

(c) our assessment by main asset category and by route;

(d) our conclusions on the efficient volumes of maintenance and renewal work and associated efficient expenditure required in CP5.

8.5 Our work in this area is supported by extensive independent reporter work.[130] The associated reports are published on our website. We have considered the reporters' findings in developing our view of maintenance and renewal efficient expenditure requirements for CP5.

Our presentation of expenditure and efficiency in this chapter

Expenditure

8.6 We present all CP4 expenditure on the basis of regulatory accounting in CP4 and therefore on the same basis as Network Rail presented its planned CP4 expenditure in its SBP. We exclude the £250m expenditure associated with accelerating civil engineering works from CP5, which formed part of the additional investment measures announced by the UK Government in its Autumn 2011 budget statement.

8.7 We present all CP5 expenditure on a slightly different basis to CP4. In CP5, works which have previously been treated as renewals expenditure, but which are associated with small scale works on buildings and civil engineering structures, will be treated as maintenance costs to align with Network Rail's statutory accounts. These works are termed 'reactive maintenance'. In its SBP Network Rail moved some of these costs from renewals to maintenance (approximately £250m over the control period associated with the Civil Engineering Framework Agreement (CEFA) contract, discussed later in this chapter). We have made a further adjustment to include all reactive maintenance costs as maintenance expenditure. We have assumed that reactive maintenance costs are 4% of total renewals costs and applied the adjustment as a high level overlay to be transparent. This results in a post-efficient movement of £507m from renewal to maintenance between the two control periods. We will refine

[130] http://www.rail-reg.gov.uk/pr13/publications/consultants-reports.php

this adjustment for final determination. To provide a valid comparison we have applied this to both Network Rail's figures and our own from CP5 onwards.

Efficiency

Maintenance

8.8 In its SBP Network Rail presented its maintenance efficiency plans using the final year of CP4 as a baseline. We are also using the final year of CP4 as a baseline but we have made adjustments so that it represents the position before efficiencies more accurately. We have:

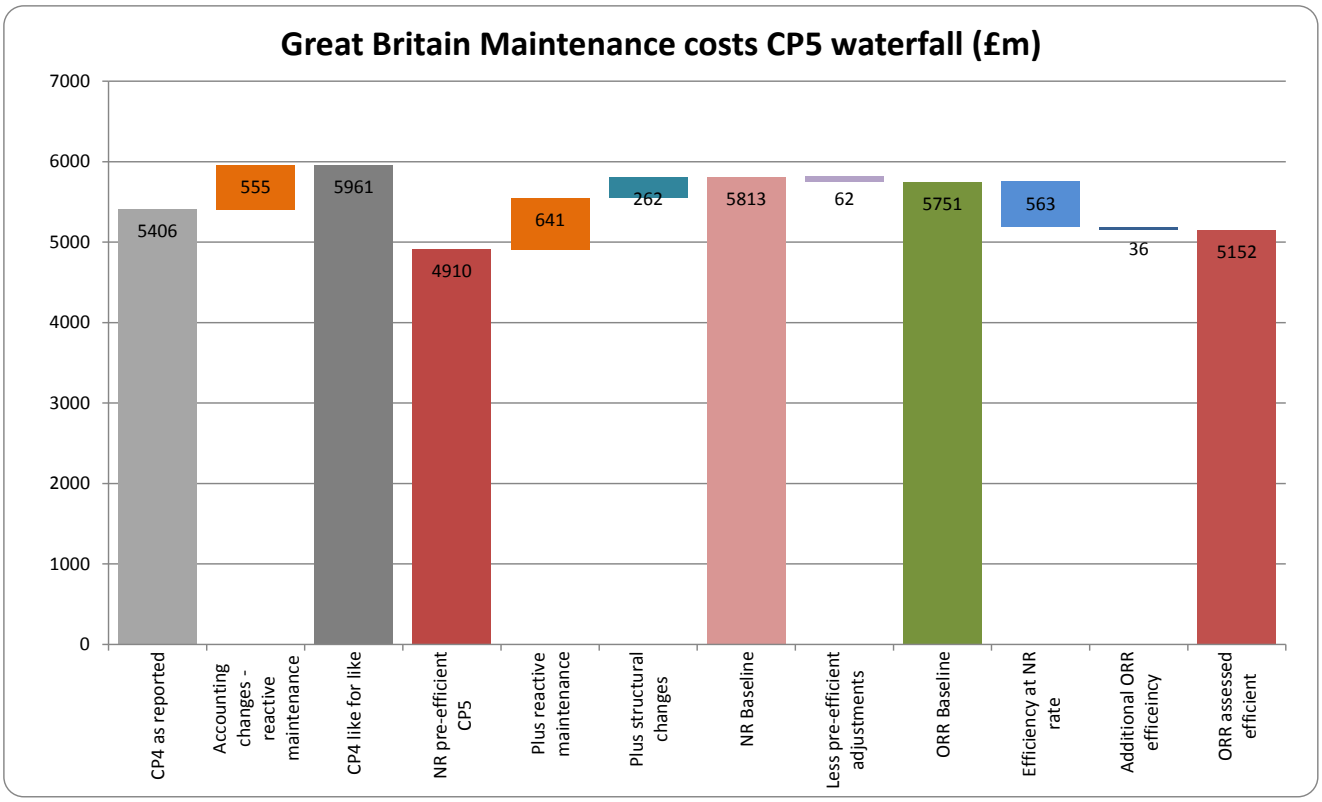
(a) added reactive maintenance costs as discussed above;

(b) increased the baseline on a yearly basis for 'structural factors'. This increase is to take account of the increased traffic and enhancement projects which will drive the need for more maintenance works and to exclude 'special projects' from the baseline which are not of representative of on-going expenditure requirements; and

(c) reduced the reactive maintenance part of the baseline for issues identified in how these costs have been forecast.

8.9 These adjustments create the 'ORR baseline' against which we have calculated our assessed efficiencies.

Figure 8.1: Our presentation of maintenance efficiencies in CP5*



*Note: This chart is a simplified representation based on a number of high-level assumptions and will not fully reconcile to all relevant tables.

Renewals

8.10 In its SBP Network Rail presented its renewals efficiencies against a pre-efficient baseline representing the volumes of work required by its new CP5 asset policies (discussed later in this chapter) and its assumed costs at the end of CP4. The new policies are intended to deliver sustainable outputs more efficiently, and therefore there are efficiencies embedded in its SBP pre-efficient expenditure. It presented its renewals efficiencies for certain key asset types. We have adjusted Network Rail's SBP pre-efficient baseline by:

(a) removing reactive maintenance costs as discussed above;

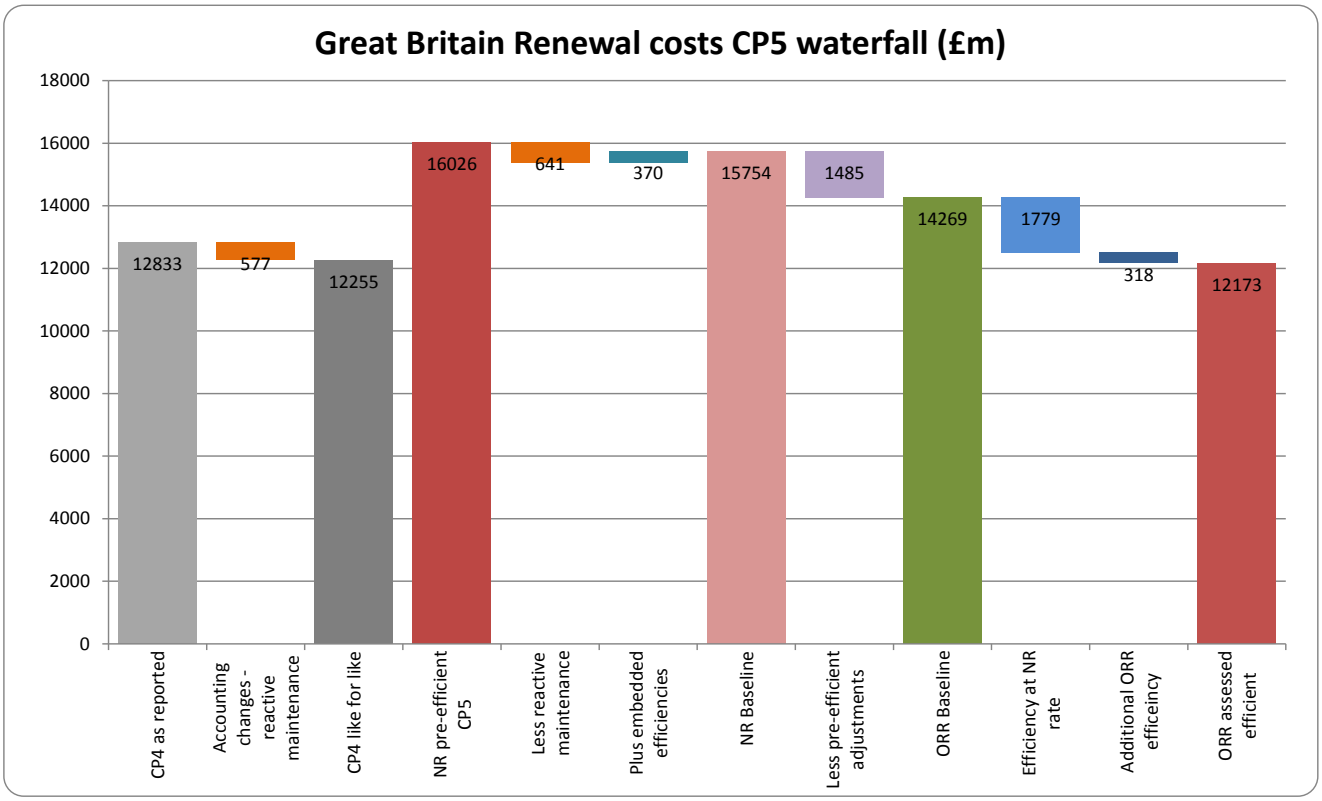
(b) adding on those efficiencies which we have assessed to be embedded in its asset policies to give a 'Network Rail baseline';

(c) making reductions to the Network Rail baseline to reflect our assessment of its pre-efficient plans giving the 'ORR baseline'; and

(d) considering efficiency across all types of renewal expenditure, not just for certain asset types.

8.11 We have presented Network Rail's proposed efficiencies as the difference between the Network Rail baseline and the post-efficient costs in the SBP. We have presented our assessed efficiencies as the difference between the ORR baseline and our assessed post-efficient expenditure. Our approach to renewals assessment is shown in Figure 8.2.

Figure 8.2: Our presentation of renewals efficiencies in CP5*



*Note: This chart is a simplified representation based on a number of high-level assumptions and will not fully reconcile to all relevant tables.

Network Rail's proposals for management of its assets

8.12 Network Rail is improving its asset management capability and plans to improve further in the remainder of CP4 and CP5. It has set out its key initiatives for CP5, including:

(a) optimisation of asset policies;

(b) further development of risk-based maintenance;

(c) improved asset information;

(d) further rollout of remote condition monitoring;

(e) development of the Asset Management Services (AMS) organisation; and

(f) development of improved asset management competence and culture.

8.13 Network Rail's SBP submissions are based on the new and improved ways of managing its assets which will be delivered by asset management capability improvements from specific programmes of work. The key programmes are set out below.

Asset Management Improvement Plan (AMIP)

8.14 We have consistently stressed the importance of Network Rail developing its asset management capability. Since 2006 we have measured this using the Asset Management Excellence Model (AMEM). Early in CP4 we and Network Rail agreed targets for improved capability as measured by AMEM to be delivered by the end of the control period. Network Rail set out how it would deliver these in its Asset Management Improvement Plan (AMIP). We have been monitoring progress against the agreed targets. Whilst Network Rail is delivering real improvements it is behind the targets in key areas and must catch up to deliver our requirements for the end of CP4.

8.15 The company has set out its proposed trajectory for further improved capability in CP5 as discussed in chapter 3. In summary it is proposing continued improvement to reach an average AMEM score of 73% at the end of CP5.

Offering Rail Better Information Services (ORBIS)

8.16 Good asset information management is essential to good asset management. We have pressed Network Rail to develop and implement plans for improved data quality, including improved processes for the collection, management and reporting of data and improved asset information systems.

8.17 Network Rail has acknowledged the need for better asset information management and has proposed a large investment in an improvement programme, Offering Rail Better Information Services (ORBIS). This includes the Asset Data Improvement Programme (ADIP) aimed at delivering asset information improvements in the short-term, to improve inputs to the planning process for CP5. Its proposed investment in ORBIS is £173m in CP5. This investment is forecast to deliver wide ranging benefits, including £270m of efficiencies within CP5. We consider these in our assessment of efficiencies.

8.18 Since publication of the SBP, Network Rail has written to us to set out the key milestones associated with ORBIS which it intends to use to monitor progress. As set out in chapter 3, we will monitor delivery of these milestones as regulated outputs.

8.19 Network Rail's asset data feed into its asset policy modelling and workbank development. We have audited the quality of these data as discussed in more detail later in this chapter.

Buildings & Civils Asset Management transformation programme

8.20 In summer 2010, we and Network Rail commissioned a comprehensive independent reporter study into all aspects of civil structures management in response to evidence of poor practice, including:

(a) Network Rail's difficulty in producing a credible PR08 civil structures and earthworks expenditure programme;

(b) its declaration that it could not guarantee sustainable stewardship beyond CP6;

(c) three bridge failures within an 18 month period; and

(d) the serving of a safety improvement notice on the Southern route. (Subsequently other improvement notices were served network-wide.)

8.21 The resulting report[131] revealed numerous shortfalls in efficient, effective stewardship and recommended a 77 point improvement plan. Network Rail accepted this and has now converted it into a detailed action plan, the Buildings & Civils Asset Management (BCAM) transformation programme. We are monitoring its delivery.

8.22 Improvements arising from the review have included better asset knowledge, the new civil structures and earthworks asset policies that have been used for the SBP submission, and a review of appropriate staffing levels. These have all influenced Network Rail's proposals for civils maintenance and renewal expenditure in CP5. The improvements must be embedded in the routes throughout the control period.

Network Operating Strategy

8.23 Network Rail's plans include proposals for investment of £1,485m to deliver NOS. £876m of this is expenditure to accelerate signalling renewal work, over and above the work required due to condition. The investment will centralise signalling and

[131] http://www.rail-reg.gov.uk/upload/pdf/reprters-audit-rev-policy-arup-mar11.pdf.

electrical control to 14 control centres. The plans indicate that this investment will result in operational efficiencies. Our review of the NOS business plan, including the associated efficiencies, is discussed in more detail in chapter 7.

Intelligent Infrastructure

8.24 Intelligent infrastructure is Network Rail's initiative to increase its Remote Condition Monitoring (RCM) of assets. RCM uses technology to detect asset degradation, making it possible to defer intervention until shortly before assets fail. Network Rail has started implementing this technology during CP4 and plans to increase its rollout in CP5 to cover further signalling, telecoms, and electrification and plant assets. Since publication of the SBP the company has written to us setting out some further details of the volumes of assets to be fitted with RCM over CP5. We expect Network Rail's milestones associated with intelligent infrastructure to be set out fully in its delivery plan and will monitor delivery of these as indicators.

8.25 The CP5 plans include expenditure of £95m on intelligent infrastructure.

New asset policies

8.26 Network Rail's asset management capability improvements have driven some significant improvements in its business planning. In particular the company has produced a suite of new asset policies which set out how it will manage its assets in CP5. The policies provide a framework to plan the volume of work activity that Network Rail considers is appropriate to manage its assets safely, efficiently and sustainably, whilst meeting the required outputs.

8.27 The new policies are set out in a consistent format using a 10 stage framework:

(i) asset description;

(ii) historical analysis;

(iii) asset criticality;

(iv) route criticality;

(v) asset degradation;

(vi) intervention options;

(vii) planning and funding scenarios;

(viii) model development;

(ix) investment options; and

(x) policy selection.

8.28 Network Rail has, for the first time, developed a suite of whole life cost models to support its asset policies. The policies set out the asset specific outputs which it believes will be delivered by the proposed interventions.

8.29 The company has set out its own analysis of the robustness, sustainability and whole life cost efficiency of its policies. It has assessed the extent to which its route maintenance and renewal plans align with central policy. Its findings are summarised below. We set out our assessment of asset policies later in the chapter.

Figure 8.3: Network Rail's assessment of its asset policies

Asset	Policy maturity (Robustness / sustainability / efficiency)	Alignment of route renewal plans with policy	Alignment of route maintenance plans with policy
Track			
Signalling			
Structures			
Earthworks			
Drainage, fencing and other off-track			
Electrical Power			
Telecoms * Centrally developed plan by Network Rail Telecoms		*	
Buildings			

8.30 Network Rail does not consider that any of its CP5 asset policies has been demonstrated to meet all three tests of robustness, sustainability and efficiency. It considers the track and signalling policies to be the most mature and structures, earthworks, drainage and telecoms to be less mature. It recognises that its structures policy is not yet fully aligned with route renewal plans.

8.31 We summarise key features of the CP5 asset policies below.

Track asset policy

8.32 Track assets include rail, sleepers, ballast, plain line, and switches and crossings (S&C).

8.33 Network Rail's CP5 track policy is a refinement of current policy, applying differing intervention options depending on the performance requirements of different parts of the network. This is achieved by moving from the current banding of routes into four 'quadrants' to the new policy of using five 'criticality bands'. The policy promotes a focus on high specification interventions, such as full renewal, for track on more critical routes and a greater focus on refurbishment and maintenance to extend asset lives on lower criticality routes. Whole life costing has been applied to help define the optimum intervention regime.

8.34 The policy introduces a move from more manual based inspections towards greater use of automated train-borne inspection and measurement and improved assessment of ballast, formation and drainage condition. On the back of improved information it aims to deliver better planning and targeting of work, including better use of wheeled plant (such as high output track renewals plant). The policy requires a move towards preventative maintenance addressing root causes and a risk based approach to inspection and maintenance. The track policy is supported by the new drainage policy.

8.35 Network Rail forecasts that the condition and performance of track will be maintained both in the short- and long-term. Ballast fouling and S&C condition are expected to improve. The policy is predicted to result in a steady state or reduced number of safety related track infrastructure failures such as rail breaks and geometry faults, with priority given to high criticality routes and critical S&C.

Off-track asset policy

8.36 The off-track asset policy addresses the management of boundary fencing and vegetation. This is the first time that the off-track policy has been produced as a separate document. (Management of these assets was previously included in the track policy.)

8.37 The policy requires more proactive management of fencing and vegetation, rather than the reactive approach that has been prevalent in CP4. Network Rail plans to improve a significant percentage of the asset and this has resulted in a substantial investment in off-track assets being proposed for CP5.

8.38 The policy for boundary fencing aims to reduce unauthorised access and thereby reduce the safety and performance risk to the railway. It is supported by improving asset knowledge which has allowed modelling of renewal and maintenance volumes and has led to an improved specification of materials. This should result in better whole life costs while ensuring that the most appropriate fencing is used, taking account of current and future adjacent land use.

8.39 The policy for vegetation management requires a proactive, cyclical approach to manage vegetation sustainably and to manage risks such as obscured signals, leaves on the line, damage to structures and falling trees. It specifies a range of interventions, ranging from routine maintenance to highly mechanised or chemical treatment.

8.40 Network Rail forecasts that its off-track policy will deliver boundary measures that meet its legal obligations and in doing so proactively manages the safety and performance risks posed by unauthorised access to the railway by people or animals. It will also manage vegetation, through a cyclical maintenance regime, in a way which best supports safe and punctual rail operations.

Signalling asset policy

8.41 The CP5 signalling asset policy covers the management of signals, their control and communication systems, interlockings (which ensure trains are routed safely), points, train detection and level crossings. Level crossings are also the subject of a separate policy which primarily addresses the management of safety risk.

8.42 The policy has been developed based on whole life cost modelling to consider the trade-off between different intervention strategies and to identify the most appropriate technology to apply. It proposes a move from conventional re-signalling to a more targeted approach of component renewal to maximise the asset life. This approach has been integrated with programmes of major interventions relating to the European Train Control System (ETCS) and implementation of NOS. The policy proposes to migrate control of signalling to centralised operational control centres at renewal. It proposes that signalling is converted to ETCS operation when renewal is required and there is sufficient rolling stock equipped for ETCS operation.

8.43 Signalling maintenance regimes are to be based on the criticality of the asset and tailored to asset type, configuration and location. The policy makes greater use of

reliability centred maintenance and remote condition monitoring to achieve this. For high criticality routes the policy involves a move towards more predictive maintenance, informed by remote condition monitoring; for low criticality routes it means a move towards more reactive maintenance. The policy also proposes the use of extended maintenance to manage assets until their renewal through major programmes of intervention such as those driven by ERTMS and NOS.

8.44 Application of the policy is forecast to result in a peak of signalling renewals expenditure in CP5 and a peak in remaining life in CP7, largely driven by a peak in ETCS re-signalling.

Level crossing asset policy

8.45 Network Rail has produced a level crossing asset policy for the first time. This reflects a need to increase the focus on level crossings as a system rather than as a collection of separate components.

8.46 The policy proposes to reduce the safety risk that level crossings contribute to the rail network, to maintain or improve condition and capability, and to move to a targeted renewal of subsystem parts. The policy sets out Network Rail's planned reduction of level crossing safety risk and its plans to facilitate closure, using the funds specified in the HLOSs: £65 million for England & Wales and £10 million for Scotland.

8.47 Whilst the policy considers renewal and maintenance issues, the focus is on reducing risk. Network Rail has developed a model to assess the risk reduction that can be achieved by a range of potential interventions.

8.48 There is a particularly close association between level crossing systems and signalling. The policy recognises the relationship between level crossings and the introduction of ERTMS and NOS which are key components of the signalling policy.

8.49 A key output of the policy is the assessment of how the level crossing safety fund can be applied to achieve the best reduction in risk.

Structures asset policy

8.50 The CP5 structures asset policy covers assets including underbridges, overbridges, major structures, tunnels, retaining walls, culverts, coastal defences and minor assets.

8.51 The policy represents a substantial change to current policy. It applies a risk based approach to deliver defined levels of safety, availability and capability. For bridges, the policy proposes application of different maintenance and renewal interventions to

address the risk associated with the condition of key structural components called principal load bearing elements (PLBEs). The associated intervention strategy is captured in a suite of 'policy-on-a-page' documents which aim to articulate policy clearly and simply, and to achieve a consistent approach to structures asset management across the network. The policy-on-a-page documents cover the main bridge types, substructures, culverts, retaining walls, tunnels and footbridges.

8.52 Network Rail has continued to develop a whole life cost model for structures, an approach it started in CP3. The bridges model analyses intervention strategies for the main bridge types. Significant groups of structures such as tunnels, major structures, and coastal, estuarine and river defences are not captured in the modelling but are assessed using individual bottom-up intervention or management plans.

8.53 The policy requires maintenance of structures on a newly developed programme of planned preventative works. Application of reliability centred maintenance is being considered but is not yet fully integrated. The case for wider application will be considered in CP5.

8.54 Network Rail's plans, based on improved condition data and the new policy, include a large increase in renewal volumes to restore the assets to a robust and sustainable position. The company proposes that the new policy is implemented over two control periods to manage funding and deliverability, with interventions focused on high criticality assets during CP5. This approach results in a peak level of expenditure in CP5 and high expenditure in CP6. Network Rail states that its understanding of civil assets is continuing to improve and the predicted volumes of work may change as a consequence. Application of the policy is forecast to improve average asset condition scores for PLBEs on bridges, reducing risk over CP5 and CP6.

Earthworks asset policy

8.55 The CP5 earthworks asset policy covers the management of embankments and cuttings.

8.56 The policy differs from the previous policy because, instead of undertaking work based on condition alone, it applies a risk-based approach to decide what work needs to be done, where and when. Work to be carried out is prioritised according to a risk metric, which is assessed on asset type, condition and criticality. For example, cuttings are considered a higher risk asset type and, within this group, rock cuttings

pose the highest risk. Condition is banded against four headings: top poor, poor, marginal and serviceable.

8.57 Four main work types are defined for earthworks assets: examination to assess condition, maintenance (for example minor repairs) to maintain asset condition, refurbishment to improve asset condition, and renewal of poor, top poor and failed assets. Drainage work (renewal, refurbishment or maintenance of the drainage) is also a key priority for earthworks, as covered by the new drainage policy.

8.58 Network Rail has developed an earthworks whole life cost model. The model has been used to investigate a wide range of policy options and intervention strategies to support the CP5 policy.

8.59 The policy aims to maintain asset condition and risk levels throughout CP5 and in the long-term. To achieve this there will be increased levels of maintenance and refurbishment and a reduction in full renewal work compared to CP4.

Drainage asset policy

8.60 Network Rail has produced a drainage asset policy for the first time, recognising the importance of drainage for performance and asset management across other key asset types. The policy covers drainage relating to earthworks, track, tunnels, structures and buildings. The document concentrates on the track and earthworks drainage, as this forms the majority of the drainage asset and has higher associated expenditure.

8.61 Network Rail's knowledge and management of its drainage asset has historically been poor. To start to address this it has carried out the Integrated Drainage Project (IDP), to review asset knowledge, carry out a survey where records are incomplete and establish a national drainage database. The policy draws on the outputs of the IDP.

8.62 The policy considers two components to drainage asset condition: its structural integrity and its service condition. Structural integrity defects are addressed by repairing or replacing the asset. Service condition relates to the water carrying capacity of the asset and defects are addressed through works such as cleansing or vegetation clearance. In both cases pipework condition is measured on a 1 to 5 grading system. Condition data for drainage remains incomplete and will be assessed over a period of years.

8.63 The criticality of the drainage assets is based on the criticality of those other asset groups which it impacts and benefits, such as track and earthworks. The policy defines various intervention options (inspect, survey, maintain, refurbish, renew and new build) depending on criticality, which are intended to minimise costs over the lifetime of the asset. For higher criticality assets the policy requires a more proactive approach to inspection and maintenance. Application of the policy is forecast to result in significantly increased renewals costs in CP5 compared to CP4 in order to bring the condition of the drainage asset up to a sustainable level, but this should reduce expenditure on dependent assets such as track and earthworks.

Buildings asset policy

8.64 The buildings asset policy covers maintenance, repair and renewal works on managed stations, franchised stations, light maintenance depots, maintenance delivery unit buildings and lineside buildings.

8.65 The policy is in two parts, 'building fabric' and 'mechanical & electrical equipment'. It extends the strategy applied in CP4 to cover better the range of operational property assets. The policy categorises stations into six groups, A to F, based on revenue and the number of people using the station (as is the case with the current policy).

8.66 It utilises an improved asset information system to understand better the condition and degradation of assets, to understand the impact of interventions and to facilitate whole life costing.

8.67 The policy requires station and light maintenance depot condition, as measured by the Station Stewardship Measure (SSM) and the Light Maintenance Depot Stewardship Measure (LMDSM), to be maintained at the levels achieved at the end of CP4. For buildings Network Rail is proposing to use the yearly number of 2 and 24 hour reactive faults to measure robustness and Percentage Asset Remaining Life (PARL) to measure sustainability. It forecasts that reported reactive faults will remain static in CP5, but that PARL will improve by 1% in CP5 and 16% by CP11 to give 58% PARL at that point. Across the buildings asset categories the policy requires maintenance, repair and renewal works to be carried out to ensure that the properties remain fit for purpose.

8.68 Further franchising out of maintenance and renewal activities to TOCs may also result in further review and development of SSM during the control period.

Electrical power asset policy

8.69 The CP5 asset policy for electrical power covers the management of traction power supply systems (including power from overhead lines and from conductor rail), and non-traction power supplies (including power for signalling, point heaters and conductor rail heating).

8.70 The policy is a significant development of the policy being used in CP4. Network Rail has changed its approach, from age-based to condition based, to achieve a lower whole life cost to manage the assets. The CP5 policy also introduces asset and route criticality and improved safety principles. It is supported by the use of whole life cost modelling to identify the optimum intervention options for the key assets covered by this policy. Modelling has been carried out for: overhead line equipment; signalling power supply systems (PSPs and signalling power distribution cables); HV switchgear for the AC and DC electrification systems; conductor rail; and HV cables on the DC electrification systems.

8.71 There is an increased focus on safety in the asset policy, including actions to reduce the amount of working on or near live conductors. The policy considers management of capacity on the network through improved system planning for electrification infrastructure. It proposes investment in metering and management systems to help increase efficient use of energy.

8.72 Network Rail forecasts that its electrical power policy will deliver a slight increase in the number of traction power failures causing delays of ten minutes or greater. This is due to a significant increase in electrical power assets in CP5, driven by the major programmes of electrification across the network. If the asset base was to remain the same as at the end of CP4, Network Rail forecasts consistent levels of performance with the end of CP4. Network Rail has modelled remaining life until CP11. These long-term forecasts highlight a reduction in remaining life, but this is again driven by the introduction of new assets due to the programme of CP5 electrification.

Telecoms asset policy

8.73 Network Rail Telecom's (NRT) CP5 asset policy for telecoms proposes a move from conventional renewals to a more targeted approach of component renewal to maximise the asset life. Whole life cost modelling has been carried out to consider the trade-off between different intervention strategies. The policy is aligned with programmes of major interventions relating to implementation of NOS.

8.74 Telecoms maintenance regimes are to be based on the criticality of the asset and tailored to asset type, configuration and location by means of implementing Service Level Agreements (SLA) with clients (the routes). The success of the asset policy is predicated on developing these SLAs that are not yet in use and therefore not proven to be achievable. NRT states that it will not be in a position to know whether the SLAs are achievable until around the middle of CP5. The policy also relies on the greater use of remote condition monitoring and the development of Risk-based maintenance Of Telecoms Equipment (ROTE) to release maintenance staff to resource the planned in-house renewal activity.

8.75 The policy aims to continue to meet the CP4 exit performance KPIs throughout CP5 despite a significant increase in asset quantities due to the introduction of GSM-R/FTN.

Wheeled plant asset policy

8.76 The CP5 asset policy for wheeled plant is a development of CP4 policy and covers management of a diverse collection of rail and road vehicles.

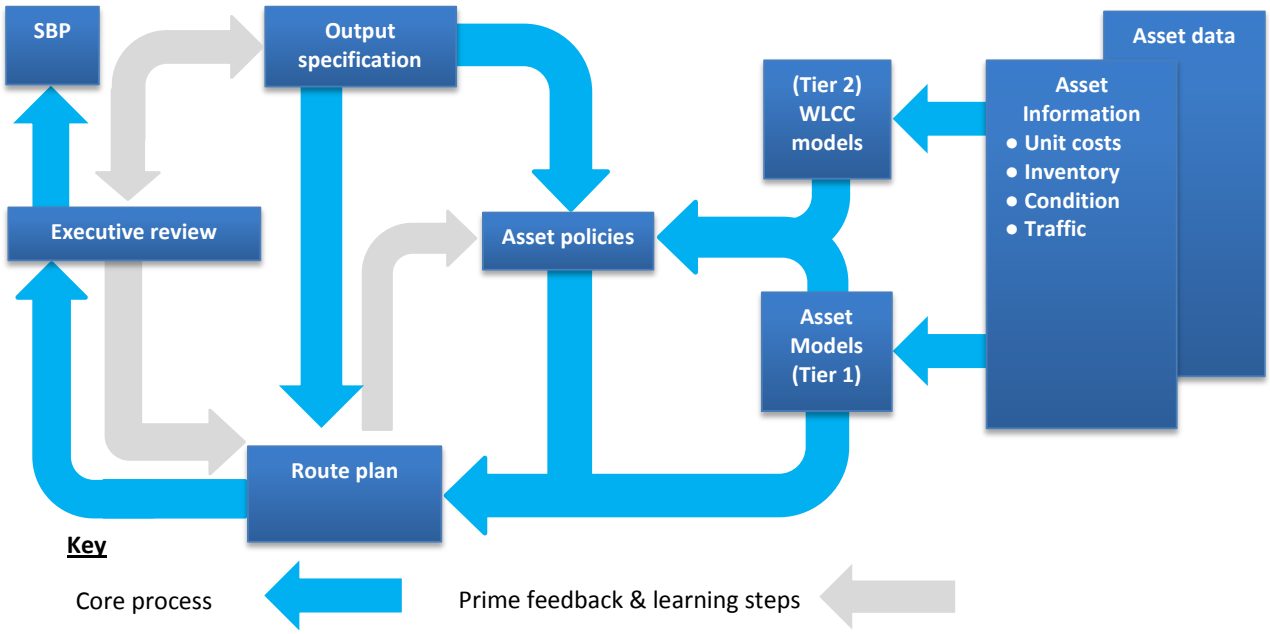
8.77 The policy is based on the requirements of the vehicle maintenance and overhaul instructions, assessment of fleet condition and known demands driven by routes and central requirements. It promotes a mix of new fleet procurement, life extension and maintaining the fleet to the existing condition. The policy drives efficiencies by extending the periods between maintenance and overhaul. The proposed intervention regime for fleet maintenance is based upon engineering information which Network Rail acknowledges is currently limited and inconsistent across some fleets.

8.78 The policy aims to deliver an overall condition, reliability and availability of fleet at the end of CP5 which is no worse than at the end of CP4, except where driven by customer demand.

Network Rail's development of its maintenance and renewals plans

8.79 Network Rail's SBP set out the process by which it developed its maintenance and renewal plans. This process is illustrated in Figure 8.4.

Figure 8.4: Network Rail's process for development of its maintenance and renewal plans



Development of maintenance plans

8.80 The key inputs to its maintenance plans are its current resource levels (labour, plant and materials), its projections of how these will need to change in CP5 (for example, to maintain new electrification assets) and its view of available efficiencies during the period. These have been used to develop its route plans for maintenance which feed directly into the SBP.

8.81 Network Rail is also developing new approaches to maintenance which are referenced in its asset policies and maintenance strategy. These have been modelled to develop a central view of future volumes and therefore costs of work.

8.82 We discuss our view of Network Rail's maintenance planning process in further detail later in the chapter.

Development of renewals plans

8.83 The key inputs to its renewals plans are its asset information (type, number, condition, location, criticality etc.), its asset degradation information and its cost information (for example unit costs).

8.84 The fundamental building block of the renewal plans is the company's suite of asset policies which set out the interventions that it will carry out in managing its assets. The policies are used in two parallel but linked processes: they are modelled to develop a

central view of future volumes and therefore costs of work; and they are used by Network Rail's ten operating routes to develop route-based workbanks, volumes and costs. The plans developed by the centre and those developed by the routes are used to challenge each other at all stages of their development. The final SBP submissions are developed from a combination of the two.

8.85 We discuss our view of Network Rail's renewals planning process in further detail later in the chapter.

Route plans

8.86 Network Rail has, for the first time, presented its maintenance and renewals plans in ten operating route plans. This reflects the recent organisational change which has devolved some asset management decision making to the routes.

8.87 For maintenance its expenditure plans are based on route estimates of the resource required to safely maintain the railway. The route-based figures include consideration of the impact of increased traffic and new infrastructure.

8.88 Network Rail's renewals expenditure plans are based on the outputs of a challenge process between modelled expenditure requirements and plans developed by the routes. The company's models produce route renewals expenditure forecasts which consider route specific asset information, unit costs disaggregated by structural factors and efficiencies applied by local asset mix. The routes produced their plans based on their local knowledge of the asset base, knowledge of delivery constraints, understanding of local costs and local efficiency initiatives. The challenge process between modelled expenditure and route-based plans has helped to improve the robustness of the route plans.

8.89 Key route specific issues are discussed in the Maintenance and Renewals sections below.

Network Rail's maintenance plans

Volumes

8.90 As discussed previously the company has built up the maintenance plans in its SBP by forecasting its resourcing requirements. In general it has not used volumes of required work as the basis for developing its maintenance expenditure plans.

8.91 Following submission of the SBP we have required Network Rail to submit its planned volumes of maintenance work to be delivered by its maintenance expenditure plans. Certain volumes have been submitted for track, electrification and power, and signalling maintenance activities, a subset of which are shown in Table 8.1. We will work with Network Rail to develop appropriate maintenance volume measures for use as indicators in CP5.

Table 8.1: Network Rail's planned maintenance volumes, Great Britain

Description	Unit	CP5					CP5
		2014-15	2015-16	2016-17	2017-18	2018-19	Total
Tamping	km	6933	6873	6749	6688	6781	34023
Stoneblowing	km	3738	3712	3668	3649	3687	18454
Manual Wet Bed Removal	Bay	20608	20457	19784	18916	18316	98081
S&C Tamping	Point End	4480	4395	4372	4320	4331	21899
Mechanical Spot Re-sleepering	Sleeper	5486	5415	5368	5425	5391	27084
Replacement of S&C Bearers	Each	8512	8340	8021	7416	8055	40344
S&C Arc Weld Repair	Number	10673	10696	10711	10714	10783	53578
Mechanical Wet Bed Removal	Bay	12189	12152	12023	11249	10962	58575
Level 1 Patrolling Track Inspection	Mile	206577	201836	197972	197901	199631	1003918
Mechanised Patrolling Track Inspection	Mile	8372	7462	7162	7162	7241	37399
Replacement of Pads & Insulators	Sleeper	553385	544931	538586	515209	529333	2681444
Jointed Track Hot Weather Preparation	Joint	552404	547527	538101	532860	531832	2702724
Manual Correction of PL Track Geometry (CWR)	Track Yard	1152599	1164832	1121455	1070372	1070232	5579489

Description	Unit	CP5					CP5
		2014-15	2015-16	2016-17	2017-18	2018-19	Total
Manual Rail Grinding	Rail Yards	418045	417777	417517	417365	417659	2088363
Rail Changing	Rail Yard	201615	197715	193905	190932	191793	975960
Fences and Boundary Walls	Yard	1010959	1045381	1036425	1049740	1082847	5225352
S&C Inspection (Other)	Point End	205544	206526	208930	211437	215341	1047778
S&C Maintenance (Other)	Point End	422003	420720	421167	420365	422869	2107125
S&C Renew Half Set of Switches	H/S Switch	874	864	851	835	865	4289
S&C Stoneblowing	Point End	858	949	1073	1043	1037	4961
Track Inspection (Other)	Miles	312536	313560	314742	315743	316517	1573097
Train Grinding - S&C	Point End	3985	3997	4003	4015	4145	20144
Signalling Cables	Various	124454	124483	124485	124418	124412	622251
Equipment Housing locations	Each	296870	296757	296431	296319	296206	1482583
Point End Routine Maintenance Powered	Point End	477654	477761	477862	478064	478076	2389416
Signals Routine Maintenance colour lights	Each	192955	193027	192488	192624	192427	963520
Train Detection - Axle Counters	Each	15096	15750	16380	17024	17115	81366
Train Detection - TC's AC	Each	100431	99916	99894	99860	99852	499951
Train Detection - TC's DC	Each	137104	136054	134481	133254	133079	673972
Level Crossings	Each	84001	84001	83927	83868	83815	419612

Description	Unit	CP5					CP5
		2014-15	2015-16	2016-17	2017-18	2018-19	Total
Maintain Conductor Rail	Various	47641	47641	47489	47263	47114	237147
Maintain OHL Components	Various	194666	199649	204566	204536	222871	1026287
Maintain Points Heating	Each	140549	140550	140551	140552	140552	702753
Maintain Signalling Power Supplies	Number	42964	42964	42964	42964	42964	214821

Efficiency

8.92 When directly comparing expenditure forecast for the final year of CP5 with proposed expenditure in the final year of CP4, maintenance costs appear to increase. However, this excludes the effect of the CEFA and reactive maintenance accounting change between the two control periods, ignores the effects of traffic and network growth, and does not adjust for projects which are not representative of on-going expenditure requirements. When expenditure forecast for the final year of CP4 is adjusted for these effects the network total efficiency proposed is 13.7%, for Scotland it is 9.9%, and for England & Wales it is 14.1%.

8.93 The forecast maintenance efficiencies are planned to come from a wide range of initiatives including:

(a) a risk based approach to maintenance ensuring that maintenance regimes are tailored to the configuration, condition and location of individual assets;

(b) improved information management allowing better targeting of work, improved response to infrastructure faults and reduced reliance on paperwork processes;

(c) further implementation of remote condition monitoring;

(d) improved working practices and multi-skilling;

(e) increased standardisation of maintenance tasks;

(f) further mechanisation, including the full rollout of plain line pattern recognition and new vegetation clearance plant;

(g) improvements to the maintenance support and administration organisation;

(h) further recycling of materials; and

(i) optimisation of contracting strategy where appropriate.

8.94 Network Rail has included some 'stretch' (approximately £140m) in its maintenance efficiency targets, over and above the efficiencies which it has allocated to specific initiatives.

Expenditure

8.95 Network Rail's SBP sets out proposed maintenance expenditure in CP5 of £5.2bn, of which £4.7bn relates to England & Wales and £0.52bn relates to Scotland. This compares to maintenance expenditure of £5.4bn in CP4, of which £4.9bn is in England & Wales and £0.48bn is in Scotland. The following tables set out its high level maintenance expenditure plans.

Table 8.2: Network Rail's plans, maintenance, Great Britain

£m (2012-13 prices)	CP4			CP5			CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Pre-efficient expenditure	-	1145	1166	1170	1166	1166	-	5813
Efficiency	-	5.4%	2.6%	2.4%	1.9%	2.2%	-	13.7%
Post-efficient expenditure	982	1083	1074	1052	1029	1006	5406	5243

Table 8.3: Network Rail's plans, maintenance, England & Wales

£m (2012-13 prices)	CP4			CP5			CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Pre-efficient expenditure	-	1036	1048	1053	1051	1056	-	5243
Efficiency	-	5.7%	2.1%	2.5%	2.0%	2.7%	-	14.1%
Post-efficient expenditure	893	977	968	948	927	906	4928	4726

Table 8.4: Network Rail's plans, maintenance, Scotland

£m (2012-13 prices)	CP4			CP5			CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Pre-efficient expenditure	-	109	118	117	115	110	-	570
Efficiency	-	3.3%	6.7%	1.4%	0.8%	-2.2%	-	9.9%
Post-efficient expenditure	89	105	106	104	102	100	478	517

Maintenance by asset

8.96 Network Rail has set out its maintenance plans by asset as described below.

Track

8.97 Network Rail's plans for track maintenance costs incurred by the routes (i.e. excluding the maintenance costs incurred by NDS) are set out in Table 8.5.

Table 8.5: Network Rail's plans, track maintenance, Great Britain

£m (2012-13 prices)	CP4			CP5			CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Pre-efficient expenditure	-	434	439	439	438	435	2185
Efficiency	-	4.7%	3.5%	2.4%	2.3%	2.6%	14.5%
Post-efficient expenditure	420	414	404	395	384	372	1969

8.98 The plans show increased pre-efficient levels of track maintenance expenditure compared to the final year of CP4 due to the effects of increased traffic and enhancement works. The company's modelling of the off-track and drainage policies suggest that increased expenditure is required to address a substantial backlog of work and to improve asset condition to a sustainable level.

8.99 Maintenance volumes show an increase in pro-active maintenance activities to improve and maintain track quality, particularly the increased use of mechanised stoneblowing. Work items such as ballast replacement and wet-bed removal are

forecast to reduce as a result of better drainage management and more targeted refurbishment items.

8.100 For track maintenance Network Rail is proposing efficiencies of 14.5% by the final year of CP5. These efficiencies are projected to come from better asset management (including improved whole life cost analysis, more proactive risk based maintenance, improved ability to automate inspection and maintenance works and improved data quality) and from improved unit costs (through better programming of work, more specialised teams but with greater multi-skilling and better management of possessions).

Signalling

8.101 Network Rail's plans for signalling maintenance are set out in Table 8.6.

Table 8.6: Network Rail's plans, signalling maintenance, Great Britain

£m (2012-13 prices)	CP4	CP5					CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Pre-efficient expenditure	-	158	158	158	159	160	793
Efficiency	-	4.6%	1.9%	1.6%	2.3%	2.0%	11.8%
Post-efficient expenditure	158	151	148	146	143	141	729

8.102 The volume of signalling maintenance is projected to increase in some routes due to enhancement works, for example Thameslink and Crossrail. Some reduction in maintenance activity is driven by the simplified maintenance regimes associated with new asset types, but this is countered by increased maintenance work driven by installation of new obstacle detection assets at level crossings.

8.103 Network Rail's plans for signalling maintenance include proposed efficiencies of 11.8% nationally by the final year of CP5. These efficiencies are projected to come from a range of initiatives, many of which are common for maintenance of different asset types. They include improved asset information management, a more targeted risk-based approach, better programming of work, greater multi-skilling, better management of possessions, improved rapid response and adoption of remote condition monitoring (for example on level crossings).

Civils and buildings

8.104 Network Rail's plans for civils maintenance are set out in Table 8.7.

Table 8.7: Network Rail's plans, civils and buildings maintenance, Great Britain

£m (2012-13 prices)	CP4	CP5					CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Pre-efficient expenditure	-	82	82	82	81	82	408
Efficiency	-	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Post-efficient expenditure	35	82	82	82	81	82	408

8.105 Activities associated with maintaining structures, earthworks and buildings are largely reported within the renewals budgets. The only activities reported as 'maintenance' are examinations and assessments subcontracted out through the national Civil Engineering Framework Agreement (CEFA). The CEFA contract covers inspection of assets such as bridges, tunnels, stations, lineside buildings, earthwork cuttings and slopes.

8.106 In its SBP submission, Network Rail treated all CEFA costs in CP5 as maintenance. In the final year of CP4 £35m of CEFA costs are treated as maintenance and £49m are treated as renewals. Total CEFA costs remain steady over CP4 and CP5 at slightly over £80m.

8.107 Network Rail has not forecast efficiencies associated with the CEFA contract during CP5.

Electrical power and fixed plant

8.108 Network Rail's plans for electrical power and fixed plant maintenance are set out in Table 8.8.

Table 8.8: Network Rail's plans, electrical power and fixed plant maintenance, Great Britain

£m (2012-13 prices)	CP4	CP5					CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Pre-efficient expenditure	-	94	101	104	105	108	512
Efficiency	-	9.6%	3.7%	3.5%	1.2%	2.2%	18.9%
Post-efficient expenditure	73	85	88	87	87	88	435

8.109 Network Rail forecasts that its pre-efficient expenditure on maintenance of electrification and plant assets will increase substantially during CP5. This is due to new electrification assets being delivered through widespread enhancement works. The Western route is forecast to see a trebling of expenditure due to Great Western electrification, and Wales and East Midlands routes will also require increased maintenance activity due to enhancement works. Increased activity is also driven by additional cable testing work to comply with legislative requirements.

8.110 Network Rail's maintenance plans for electrical power and fixed plant are largely based on historical headcount with overlays applied for maintenance of new assets and increased efficiencies. Efficiencies are projected to be generated by activity reductions from initiatives such as improved planning and targeting of work, adoption of improved remote condition monitoring and application of risk based maintenance. Unit cost efficiency initiatives include developing a multi-skilled workforce, improving resourcing strategy and improving possession strategy. Network Rail projects electrification and fixed plant maintenance efficiencies of 18.9% nationally by the final year of CP5.

Telecommunications

8.111 Network Rail's plans for telecoms maintenance incurred by the routes (i.e. excluding the maintenance costs incurred by NRT) are set out in Table 8.9.

Table 8.9: Network Rail's plans, telecoms maintenance, Great Britain

£m (2012-13 prices)	CP4	CP5					CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Pre-efficient expenditure	-	22	22	21	21	21	107
Efficiency	-	3.9%	3.7%	2.6%	3.3%	5.0%	17.1%
Post-efficient expenditure	21	21	20	19	19	18	97

8.112 Telecoms maintenance activity will increase at the start of CP5 due to the increased asset base driven by the FTN / GSM-R project. During the period maintenance requirements will be reduced as obsolete assets are removed. Telecoms maintenance efficiencies are forecast to come from increased productivity with more renewals work being delivered and charged out.

Other Network Operations maintenance

8.113 Network Rail's plans include significant expenditure against other maintenance costs items, such as indirect staff within the routes and at headquarters, route asset management teams, asset management services and national delivery service.

8.114 Asset management services costs in maintenance include the costs associated with the asset information directorate, asset management technical services and asset management telecoms. Across support and maintenance activities, asset management services are forecast to deliver 20% efficiencies.

8.115 National Delivery Service (NDS) forms part of Network Rail's corporate services function and is its national logistics and procurement service provider. Its maintenance activities include operation and servicing of strategic plant (e.g. rail grinding and infrastructure monitoring plant), support logistics (e.g. train network runs and shunting) and associated staff costs. NDS activities are forecast to deliver 15% efficiencies during the period (over both support and maintenance activities).

Maintenance – route specific issues

8.116 All routes have assessed their maintenance expenditure requirements for CP5 through resource based plans. The routes have generally accepted central proposals for efficiency opportunities and, in some cases, set out their own initiatives. Network Rail's post-efficient plans are set out by route in Table 8.10.

Table 8.10: Network Rail's post-efficient maintenance plans, by route

£m (2012-13 prices)	CP4		CP5				CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Anglia	99	104	103	102	99	94	503
East Midlands	50	58	58	56	54	54	280
Kent	67	75	73	71	70	68	355
LNE	154	160	162	158	159	161	800
LNW	252	271	267	262	255	247	1302
Scotland	89	105	106	104	102	100	517
Sussex	52	57	57	53	52	50	269
Wales	52	61	59	59	58	57	294
Wessex	78	83	82	81	77	73	395
Western	87	109	108	106	103	103	528

Note: CP5 expenditure includes additional costs associated with reactive maintenance.

8.117 We highlight some of the key route specific factors included within the SBP below.

Anglia

8.118 The Anglia route plan includes incremental maintenance expenditure required for Crossrail and the introduction of an additional OLE team on the North London Line.

8.119 Some local efficiencies have been identified, including those resulting from delivery of capital expenditure, improved S&T response, rationalisation of depots and reorganisation of works delivery.

East Midlands

8.120 The route plan includes significant maintenance efficiencies but these will be offset by the increased maintenance requirements introduced by the Thameslink programme and electrification of the Midland Main Line.

8.121 Forecast efficiencies are in line with central submissions and include gains through remote condition monitoring and plain line pattern recognition.

Kent

8.122 The Kent route plan includes extra resource for measuring the condition of signalling power supply cables. Its electrical power asset base will increase due to enhancements including Thameslink, Crossrail and other HLOS associated power supply upgrades.

8.123 Kent's maintenance costs are influenced by a high number of structures which require additional maintenance resource (bridges which support the rails on longitudinal timbers) and by a high density of S&C with difficult access. It is also proposing changes to practice through, for example, mechanised vegetation management, more remote condition monitoring, use of plain line pattern recognition and mobile maintenance units.

LNE

8.124 The LNE route maintenance plan considers the requirement for increased resource to service the new electrification assets between Leeds, Selby and at Colton Junction. It also includes the introduction of mobile maintenance units to make best use of track access opportunities, and two dedicated drainage teams to mitigate the risk of bank slips in extreme weather. The impact of NOS is considered to be cost neutral. The route sees real efficiency gains to be made through better front-line planning and assumes further efficiencies will be delivered through the centrally identified initiatives.

LNW

8.125 LNW's plan is generally in line with policies and centrally identified efficiencies but some further efficiencies have been identified by the route. It proposes routine helicopter patrols of OLE, enhancing the train-borne collection of conducting systems information and efficiencies in the management of track geometry.

8.126 The scope of the route's maintenance activity is increased due to enhancement works including electrification in the North West and at the South end of LNW. The plan includes a significant increase in resource for testing of cables and for introduction of dedicated lookout operated warning system teams.

Scotland

8.127 The Scotland route plan commits to delivering the volumes of maintenance work determined by the asset management organisation to reflect asset policy. It has made

some changes to route criticality classifications to reflect their importance to the Scottish network.

8.128 The route plan includes a significant increase in volumes of track work such as tamping, rail replacement and fencing to address areas of non-compliance and remove temporary non-compliances. The higher volumes partly reflect an increased asset base due to enhancements and the Borders rail link.

8.129 The route has carried out an aerial survey of vegetation to target its vegetation management programme to return the asset to a sustainable position. Its drainage plans are also based on improved asset knowledge from the national drainage survey and include routine drainage surveys within the maintenance remit.

8.130 Further electrification resource has been planned to deliver increased work driven by improved asset knowledge, signalling power cable testing requirements and enhancement schemes such as EGIP and the new Borders Railway.

8.131 The plan includes consideration of the impact of central efficiency initiatives which particularly drive efficiency for track and electrification. Although centrally derived efficiencies are thought to deliver benefits for signalling and telecoms delivery, the plan assumes that they will not generate savings to headcount as resource requirements are driven by need to provide emergency response. The route has developed a local initiative to move to two person signalling and telecoms teams to deliver efficiency.

Sussex

8.132 The route has, in the main, accepted centrally identified maintenance efficiencies and identified some additional local efficiencies. Its plans include the consolidation of delivery units into one route-wide delivery unit and the rationalisation of depots. Track efficiencies are envisaged from higher productivity of new on-track machines and better rail management (tamping and rail-head grinding). Signalling efficiencies are lower than national efficiencies due to the plan not to fit lightweight structures until half-way through CP5.

8.133 In some areas it identifies drivers of increased work load, for example where there is an increase in the asset base, as is the case with the GSM-R network.

Wales

8.134 The Wales route maintenance plan aims to deliver central policy and to implement centrally identified maintenance efficiencies. It identifies that enhancement schemes will impact the route's maintenance requirements for electrification.

Wessex

8.135 The route considers its maintenance plan to be in line with asset policy but identifies a need to improve track maintenance in CP5 as it recognises that it may not meet the CP4 exit targets. Additional volumes of track maintenance are forecast in response to tonnage increases following enhancements in CP4. Vegetation management is identified as a particular problem for the route, with a proposed programme of lineside de-vegetation and weed killer treatment.

Western

8.136 Western's plans for maintenance in CP5 are driven by major investments over the period, including Crossrail, Reading remodelling and electrification. Maintenance activities will be impacted by increased traffic and resulting degradation rates, an increased asset base and a reduction in access. The route will significantly increase its electrical power resource to maintain the increased asset base. In other asset disciplines maintenance and renewal works carried out in possessions will be impacted by the increased need for electrical isolations towards the end of the period.

8.137 Efficiencies in the Western plan are aligned with the nationally identified strategies and include the move towards risk based maintenance regimes, increased mechanisation and a multi-skilled workforce. The route sees key opportunities in maintaining assets as systems (particularly S&C), taking a holistic approach to the risks being controlled.

Network Rail's renewals plans

8.138 This section covers Network Rail's plans for renewals in CP5. Its proposed volumes of asset renewal during the period are set out in Tables 8.11 to 8.13. These tables set out some of the key volumes planned by Network Rail; they do not capture all volumes proposed. We will work with Network Rail to develop appropriate renewal volume indicators for CP5. The company's planned renewals expenditure and efficiencies are set out in Tables 8.14 to 8.16.

Volumes

8.139 Network Rail has forecast track renewals volumes for CP5 based on the new ways of working defined by its track policy. This has made comparison of volumes to CP4 difficult. Volumes have therefore been converted to kilometres of rail, sleeper and ballast renewal, and number of S&C units. On this basis, the company plans to deliver fewer kilometres of rail and sleepers, more kilometres of ballast and significantly more S&C units. These changes are mainly driven by the new policy, but also include accelerated renewals.

8.140 Signalling volumes, as measured in Signalling Equivalent Units (SEUs), are forecast to be much higher in CP5 than in CP4. Total SEU renewals almost double, from approximately 5,800 in CP4 to approximately 11,000 in CP5. The increase is largely driven by renewals associated with delivery of NOS. The SEU volume for CP5 shows a marked increase in ERTMS delivered units, in line with the ERTMS national strategy. The number of level crossings renewals to be delivered also increases from 123 in CP4 to 499 in CP5, again largely driven by NOS and requirements for obstacle detection.

8.141 Network Rail forecasts that its new civils asset policy requires a step-change in civil asset renewals volumes, with increases relative to CP4 in almost all work types. Volumes of underbridge works are forecast to increase by 101%, volumes of overbridge works by 7%, volumes of tunnels works by 58% and volumes of coastal and estuarial defences by 141%.

8.142 Volumes of renewals relating to buildings assets have not been captured during CP4 but have been forecast for CP5 for franchised and managed station assets.

8.143 Plans for electrification and fixed plant show increased volumes of conductor rail and low voltage DC (LVDC) distribution cables compared to CP4. AC distribution volumes are significantly lower than in CP4 as are all DC distribution volumes with the exception of LVDC distribution cables. A high volume of signalling power cable renewals is planned to address a recently identified backlog of work. The plans include new volume measures for CP5, including volumes of overhead line mid-life refurbishments and of signalling power cable renewals.

Table 8.11: Network Rail's planned renewal volumes (subset of main categories), Great Britain

Volumes	Units	CP5					CP5
		2014-15	2015-16	2016-17	2017-18	2018-19	Total
Track							
Rail	km	744	690	841	850	815	3939
Sleepers	km	459	434	551	564	547	2555
Ballast	km	578	642	661	603	663	3146
S&C	no.	599	580	671	597	610	3056
Signalling							
Conventional resignalling	SEU	1742	2769	2559	1715	1048	9832
ERTMS resignalling	SEU	0	80	115	146	868	1209
Level crossings	no.	58	95	137	124	85	499
Civils							
Overbridges	sq ms	10012	10012	10012	10012	10012	50062
Underbridges	sq ms	156530	153468	154031	153463	156846	774337
Tunnels	sq ms	24627	24627	24627	24627	24627	123136
Buildings (franchised stations)							
Building - Roof Structure	sq ms	20493	4934	2660	2879	2549	33515
Platform - Surface	sq ms	69868	62404	85518	56410	29137	303337
Canopy - Roof Structure	sq ms	21195	18093	20729	18305	16058	94380
Train Shed - Roof Structure	sq ms	30314	10613	22480	2765	450	66622
Footbridge - Surface	sq ms	5855	3337	5049	4578	2663	21482
Electrical power and fixed plant							
Overhead line mid-life refurbishment, wire runs	no.	59	70	70	65	52	316
Overhead line structure renewal	no.	116	158	186	63	99	621

Volumes	Units	CP5					CP5
		2014-15	2015-16	2016-17	2017-18	2018-19	Total
DC distribution HV switchgear renewals	no.	17	36	3	9	3	68
DC distribution HV cable	km	47	25	28	21	21	142
LV DC switchgear renewal	no.	82	78	70	69	34	332
Conductor rail renewal	km	40	32	40	23	15	149
Signalling power distribution	km	469	755	649	619	318	2810
Telecoms							
SISS CIS	no.	2662	2265	2242	2113	1714	10996
SISS PA	no.	1007	1466	1377	394	351	4596
SISS CCTV	no.	91	263	228	228	109	919

Table 8.12: Network Rail's planned renewal volumes (subset of main categories), England & Wales

Volumes	Units	CP5					CP5
		2014-15	2015-16	2016-17	2017-18	2018-19	Total
Track							
Rail	km	642	588	712	721	686	3349
Sleepers	km	390	364	454	467	450	2126
Ballast	km	523	587	583	524	585	2801
S&C	no.	548	529	620	546	559	2803
Signalling							
Conventional resignalling	SEU	1725	2514	1867	1594	966	8666
ERTMS resignalling	SEU	0	80	115	146	868	1209
Level crossings	no.	53	95	126	123	81	478
Civils							
Overbridges	sq ms	8941	8941	8941	8941	8941	44706
Underbridges	sq ms	133845	132073	132391	130723	133470	662504
Tunnels	sq ms	20400	20400	20400	20400	20400	102000
Buildings (franchised stations)							
Building - Roof Structure	sq ms	20173	4669	2638	2879	2549	32908
Platform - Surface	sq ms	69868	62404	85408	56410	29137	303227
Canopy - Roof Structure	sq ms	21195	18093	20729	18281	16057.9	94356
Train Shed - Roof Structure	sq ms	30314	10613	22400	2395	0	65722
Footbridge - Surface	sq ms	5855	3337	5049	4578	2663	21482
Electrical power and fixed plant							
Overhead line mid-life refurbishment, wire runs	no.	56	67	67	62	49	301

Volumes	Units	CP5					CP5
		2014-15	2015-16	2016-17	2017-18	2018-19	Total
Overhead line structure renewal	no.	113	155	183	60	96	606
DC distribution HV switchgear renewals	no.	17	36	3	9	3	68
DC distribution HV cable	km	47	25	28	21	21	142
LV DC switchgear renewal	no.	82	78	70	69	34	332
Conductor rail renewal	km	40	32	40	23	15	149
Signalling power distribution	km	397	681	575	512	245	2410
Telecoms							
SISS CIS	no.	2662	1471	2242	2113	1714	10202
SISS PA	no.	1007	1466	1377	394	351	4596
SISS CCTV	no.	88	211	228	226	106	860

Table 8.13: Network Rail's planned renewal volumes (subset of main categories), Scotland

Volumes	Units	CP5					CP5
		2014-15	2015-16	2016-17	2017-18	2018-19	Total
Track							
Rail	km	101	101	129	129	129	590
Sleepers	km	69	69	97	97	97	429
Ballast	km	55	55	78	78	78	345
S&C	no.	51	51	51	51	51	253
Signalling							
Conventional resignalling	SEU	17	255	692	121	82	1167
ERTMS resignalling	SEU	0	0	0	0	0	0
Level crossings	no.	5	0	11	1	4	21
Civils							
Overbridges	sq ms	1071	1071	1071	1071	1071	5356
Underbridges	sq ms	22685	21395	21639	22740	23375	111834
Tunnels	sq ms	4227	4227	4227	4227	4227	21137
Buildings (franchised stations)							
Building - Roof Structure	sq ms	320	265	22	0	0	607
Platform - Surface	sq ms	0	0	110	0	0	110
Canopy - Roof Structure	sq ms	0	0	0	24	0	24
Train Shed - Roof Structure	sq ms	0	0	80	370	450	900
Footbridge - Surface	sq ms	0	0	0	0	0	0
Electrical power and fixed plant							
Overhead line mid-life refurbishment, wire runs	no.	3	3	3	3	3	15
Overhead line structure renewal	no.	3	3	3	3	3	15

Volumes	Units	CP5					CP5
		2014-15	2015-16	2016-17	2017-18	2018-19	Total
DC distribution HV switchgear renewals	no.	0	0	0	0	0	0
DC distribution HV cable	km	0	0	0	0	0	0
LV DC switchgear renewal	no.	0	0	0	0	0	0
Conductor rail renewal	km	0	0	0	0	0	0
Signalling power distribution	km	72	73	74	107	73	400
Telecoms							
SISS CIS	no.	0	794	0	0	0	794
SISS PA	no.	0	0	0	0	0	0
SISS CCTV	no.	3	52	0	2	3	59

Efficiency

8.144 Network Rail has proposed CP5 exit renewals efficiencies of 15.7% for the network, 15.5% for Scotland and 15.7% for England & Wales[132].

8.145 The company has set out plans for its renewals efficiencies in a series of business cases. Key areas for delivering efficiencies are:

(a) development of policies which Network Rail considers to be better optimised for minimum whole life cost;

(b) asset information efficiencies to be delivered by ORBIS;

(c) better scheduling of work;

(d) more effective contractual relationships;

(e) standardisation of processes; and

(f) multi-skilling of staff.

[132] In Network Rail's SBP it presented renewals efficiency for 'core' asset renewals only, which it defined as track, signalling, civils, buildings, telecoms, and electrification and plant. It presented figures excluding the efficiencies which are built into its CP5 asset policies. Figures presented here are for all renewals expenditure and include the efficiencies which are built into its CP5 policies.

8.146 Efficiencies are discussed by main asset category later in the chapter.

Expenditure

8.147 Network Rail forecasts renewals expenditure of £13.8bn across the network, £1.49bn in Scotland and £12.3bn in England & Wales. This level of expenditure is considerably higher than in CP4 despite efficiencies achieved in CP4 and forecast to the end of CP5, and despite an accounting change moving costs from renewals to maintenance. Network Rail's key proposals which drive this increase in expenditure are:

(a) the rationalisation and centralisation of signalling control through implementation of NOS;

(b) a large increase in proposed expenditure on civil structures and earthworks renewals resulting from the application of the updated policy and a better understanding of asset condition, degradation and risk, the net effect of which is forecast to deliver a step-change improvement in the level of civil assets risk on the network;

(c) renewals brought forward from future control periods to deliver work more effectively, for example as the result of enhancement schemes, or to make use of access before it is limited by traffic growth;

(d) proposed expenditure on improving asset information systems and management, ORBIS; and

(e) a proposal for additional investment schemes where Network Rail believes there is a business case. For example it has proposed additional investment in improved information technology, Research & Development (R&D), safer and faster isolations and a new system to provide alerts to track workers.

Table 8.14: Network Rail's plans, renewals, Great Britain

£m (2012-13 prices)	CP4			CP5			CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Pre-efficient expenditure	-	3017	3202	3243	3163	3129	-	15754
Efficiency	-	8.2%	2.7%	2.8%	1.6%	1.4%	-	15.7%
Post-efficient expenditure	2784	2770	2861	2818	2704	2638	12833	13791

Table 8.15: Network Rail's plans, renewals, England & Wales

£m (2012-13 prices)	CP4			CP5			CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Pre-efficient expenditure	-	2697	2810	2885	2835	2809	-	14036
Efficiency	-	8.0%	2.8%	2.6%	1.7%	1.5%	-	15.7%
Post-efficient expenditure	2541	2481	2511	2512	2426	2367	11476	12297

Table 8.16: Network Rail's plans, renewals, Scotland

£m (2012-13 prices)	CP4			CP5			CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Pre-efficient expenditure	-	320	392	358	328	320	-	1718
Efficiency	-	9.7%	1.3%	4.0%	0.9%	0.3%	-	15.5%
Post-efficient expenditure	243	289	350	306	278	271	1356	1493

Outputs

8.148 Network Rail has forecast the asset condition and performance metrics which its policies will deliver as described in chapter 3. It is developing its forecasts of asset condition for the whole asset base, presented in five condition bands. For both condition and performance its approach is, in the main, to keep asset specific metrics constant at the level forecast for the end of CP4. However, for civil structures, earthworks and off-track it is planning an improvement in overall condition. For track, number of failures per year causing delays of greater than 10 minutes is forecast to increase marginally. For electrification and plant the same metric is forecast to increase by approximately 10%. For structures, the number of open risk items with a risk score of greater than 20 is expected to reduce significantly by the end of CP5.

Renewals national by asset

Track

8.149 Network Rail’s plans for track renewals are shown in Table 8.17.

Table 8.17: Network Rail's plans, track renewals, Great Britain

£m (2012-13 prices)	CP4			CP5			CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Pre-efficient expenditure	-	780	769	833	794	779	-	3954
Efficiency	-	7.6%	3.6%	2.3%	3.2%	3.5%	-	18.8%
Post-efficient expenditure	816	720	684	725	669	633	3762	3431

8.150 Network Rail's proposed track policy is intended to maintain track performance throughout CP5 at the level targeted for the end of CP4. It proposes an increased focus on refurbishment and maintenance options as alternatives to full renewal, and increased focus on S&C to target work at more critical assets and reduce risk. This approach leads to a reduced volume of rail and sleeper renewal but an increased volume of ballast and S&C renewal.

8.151 Track renewal expenditure (excluding off-track assets) is forecast to be £3.08bn (£3.55bn before efficiencies) in CP5, compared with £3.52bn expenditure expected in CP4.

8.152 The off-track policy moves from a reactive approach to failed assets to a proactive one using clear risk-based intervention criteria and this is forecast to result in expenditure of £0.35bn (£0.41bn before efficiencies) in CP5, much greater than the £0.24bn planned in CP4.

8.153 The track renewals expenditure plans include £325m of accelerated renewals. £169m of this relates to renewals brought forward on the Western route in anticipation of engineering access constraints following electrification and completion of Crossrail. £64m of the accelerated renewals are in LNE where carrying out track renewals prior to electrification enhancements will reduce unit costs. Anglia is planning £30m of accelerated track renewals to benefit from synergies with the Crossrail programme. Wessex, Sussex, Kent and East Midlands routes have included accelerated renewals driven by increased tonnage as a result of enhancements.

8.154 Network Rail is planning track renewals efficiency of 18.8% by the end of CP5. This is projected to come from improved supply chain management, revision of standards and rules, reduction in site overheads, and a transition to design and build contracts.

Contractor resource utilisation will be improved through better workbank visibility and better profiling of work through weeknights to facilitate a full-time, more highly skilled workforce.

8.155 Off-track renewals efficiencies of 19.2% are planned for CP5.

Signalling

8.156 Network Rail's plans for signalling renewals are shown in Table 8.18.

Table 8.18: Network Rail's plans, signalling renewals, Great Britain

£m (2012-13 prices)	CP4	CP5					CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Pre-efficient expenditure	-	835	935	888	769	707	-	4133
Efficiency	-	8.4%	4.1%	4.9%	4.1%	3.6%	-	22.7%
Post-efficient expenditure	533	765	821	742	616	546	2421	3490

8.157 Its signalling renewals plans are influenced by three main drivers: condition driven renewals, the implementation of NOS and the industry move to ETCS. It has built its plans by overlaying programmes of work on to the base level of renewals work required by adoption of CP5 policy.

8.158 NOS drives a large increase in signalling renewals spend in CP5 but its benefits are realised in operating expenditure. The move to ETCS should generate other benefits in the long-term including reducing the lineside assets and related work, improving capacity and improving safety.

8.159 Proposed signalling renewal expenditure for CP5 is £3.49bn (£4.13bn before efficiencies), compared to £2.42bn planned in CP4.

8.160 Signalling renewals efficiencies of 22.7% are forecast to be delivered by the final year of CP5. Some of these are forecast to be delivered through scope efficiencies from its CP5 policies and enabled by the ORBIS asset information programme. The remainder are built into its framework contracts and include efficiencies from collaborative / partnership working, efficiency initiatives identified by Network Rail and efficiencies agreed to be delivered by the contractor.

Civils

8.161 Network Rail's plans for civils renewals are shown in Table 8.19.

Table 8.19: Network Rail's plans, civils renewals, Great Britain

£m (2012-13 prices)	CP4	CP5					CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Pre-efficient expenditure	-	592	576	575	572	590	-	2904
Efficiency	-	4.6%	2.1%	2.2%	3.0%	2.7%	-	13.8%
Post-efficient expenditure	397	565	539	525	506	509	1944	2644

8.162 Network Rail has forecast civils expenditure of £2.64bn (£2.90bn before efficiencies) in CP5. This compares to planned expenditure of £1.94bn in CP4. The increase in proposed expenditure is driven by projected costs from implementation of CP5 policy and improved understanding of the civils asset base. The new policy is intended to deliver a lower level of risk on the network.

8.163 Network Rail's plans include civils renewals efficiency of 13.8% by the final year of CP5. Its identified efficiency initiatives are largely common to structures and earthworks. A key enabler of efficiency is planned to be improved asset information which is expected to be more readily available, to enhance decision making and to be delivered through improved asset monitoring regimes. Better business planning and better collaboration between asset teams will improve work packaging to maximise possession productivity. Innovative ways of delivering high volumes of work and unit cost reductions from improved supply chain management also contribute to projected efficiencies.

Buildings

8.164 Network Rail has forecast buildings expenditure of £1.19bn in CP5 (£1.39bn before efficiencies) as shown in Table 8.20. This compares to a forecast expenditure of £1.28bn in CP4.

Table 8.20: Network Rail's plans, buildings renewals, Great Britain

£m (2012-13 prices)	CP4			CP5			CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Pre-efficient expenditure	-	334	311	285	250	214	-	1394
Efficiency	-	9.6%	4.2%	2.0%	3.4%	4.3%	-	21.4%
Post-efficient expenditure	216	302	270	242	205	168	1279	1187

8.165 Network Rail's plans include buildings renewals efficiencies of 21.4% by the final year of CP5. These efficiencies are expected to come from scope efficiencies from its CP5 policies, improved asset management systems, improved planning of work and improved tendering of work.

8.166 Franchised stations account for over half of the total funding requested for buildings and plans have been developed from a modelled approach. Lineside buildings, light maintenance depots and depot plant have also been modelled. Expenditure requirements for the other asset types have been planned using historic levels of expenditure.

Electrical power and fixed plant

8.167 Network Rail has forecast electrical power and fixed plant expenditure of £0.92bn in CP5 (£1.18bn before efficiencies). This compares to a forecast expenditure of £0.80bn in CP4.

8.168 The company's plans include accelerated renewal of electrification assets on the Anglia route, totalling £47m, to address performance issues.

Table 8.21: Network Rail's plans, electrical power and fixed plant renewals, Great Britain

£m (2012-13 prices)	CP4			CP5			CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Pre-efficient expenditure	-	284	271	248	199	176	-	1178
Efficiency	-	14.6%	6.1%	4.1%	5.4%	1.2%	-	28.2%

£m (2012-13 prices)	CP4			CP5			CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Post-efficient expenditure	280	243	217	191	144	127	797	922

8.169 The volumes of renewal work proposed for CP5 are markedly different to those forecast to be delivered during CP4. This is a result of significant changes to the asset policy, an increased focus on electrical safety, higher volume forecasts to maintain outputs in CP5 and the impact of enhancement schemes. For example, the CP5 asset policy changes the mix of overhead line renewals compared to CP4. The policy results in a lower volume of re-wiring and campaign changes but a new requirement for mid-life refurbishments as supported by whole life cost analysis.

8.170 Efficiency for electrical power and fixed plant is projected to be 28.2% by the final year of CP5. This efficiency is proposed to be delivered through four key initiatives:

(a) programme optimisation: providing an accurate forward view of planned work to suppliers enabling improved efficiency in the supply chain;

(b) standard scheme design: development of standard designs, where applicable, to reduce design effort;

(c) procurement: using standard specifications and market stimulation to expand the potential supplier base and increase competition; and

(d) delivery model: optimising the mix of work between internal resources and contractors.

Telecommunications

8.171 Network Rail plans expenditure of £0.41bn on telecoms renewals in CP5 (£0.47bn before efficiencies).

Table 8.22: Network Rail's plans, telecoms renewals, Great Britain

£m (2012-13 prices)	CP4			CP5			CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Pre-efficient expenditure	-	132	103	100	74	55	-	465
Efficiency	-	8.1%	3.0%	3.3%	2.0%	3.1%	-	18.2%
Post-efficient expenditure	236	122	92	86	63	45	1150	408

8.172 The plans for telecoms show a significant reduction from CP4 levels of expenditure. This is due to large programmes of work related to GSM-R and FTN undertaken during CP4 coming to an end.

8.173 Efficiencies of 18.2% are projected by the final year of CP5 for telecoms renewals. These are forecast to be delivered through scope efficiencies from its updated CP5 policies, improvements to workbank planning, efficiencies from adoption of different technologies and an improved approach to design.

Wheeled plant and machinery

8.174 Network Rail plans renewals expenditure of £0.6bn on wheeled plant and machinery in CP5 (£0.64bn before efficiencies) as shown in Table 8.23.

Table 8.23: Network Rail's plans, wheeled plant and machinery renewals, Great Britain

£m (2012-13 prices)	CP4			CP5			CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Pre-efficient expenditure	-	168	122	123	131	94	-	637
Efficiency	-	8.3%	-1.9%	-1.6%	0.0%	0.2%	-	5.3%
Post-efficient expenditure	86	154	114	117	124	89	346	598

8.175 The plans for wheeled plant and machinery show an increase in expenditure compared to CP4. This is largely driven by increased expenditure on road rail vehicles and provision of additional high output fleets.

Other renewals

8.176 Network Rail has put forward proposals for renewal expenditure in other areas. The majority of this is for investment in schemes which the company believes will deliver value for money and/or safety benefits in the long-term.

IT

8.177 Network Rail plans expenditure of £613m on IT renewals in CP5, an increase of £146m compared to CP4.This excludes expenditure on ORBIS. The proposal is based on benchmarking work that the company has carried out, which indicates higher levels of investment by other organisations.

Property

8.178 Property renewals include expenditure on maintenance delivery units, offices and commercial property. The SBP includes expenditure of £124m on property renewals, a reduction of £130m on expenditure in CP4.

Asset information strategy - ORBIS

8.179 The SBP includes plans for the asset information improvement programme ORBIS as discussed previously.

Intelligent Infrastructure

8.180 Network Rail has included expenditure of £95m in its plans for the further roll-out of remote condition monitoring as discussed previously.

Systems for safer working

8.181 The SBP includes a proposal for £100m in CP5 to deliver new technology to provide protection to staff working trackside.

Faster and safer isolations

8.182 Network Rail's plans include £230m proposed expenditure to deliver infrastructure which will allow electrical isolations to be carried out more efficiently and more safely on both the DC and AC networks.

Research and Development

8.183 Network Rail has included £300m proposed expenditure to increase its research and development activity. This level of expenditure has been developed on the basis of the company's benchmarking of expenditure across all sectors.

Renewals – route specific issues

8.184 Route specific renewals plans are set out below, highlighting any deviation from asset policy and central plans.

Table 8.24: Network Rail's plans, post-efficient renewals by route

£m (2012-13 prices)	CP4		CP5				CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Anglia	237	202	229	275	238	202	1146
East Midlands	140	161	146	126	120	109	662
Kent	214	228	221	198	195	206	1049
LNE	445	422	475	443	491	536	2367
LNW	557	546	560	577	539	534	2755
Scotland	243	289	350	306	278	271	1493
Sussex	182	169	187	160	172	154	842
Wales	168	195	157	165	123	115	755
Wessex	200	219	216	261	249	211	1156
Western	303	339	320	307	298	301	1565

Anglia

8.185 Anglia route's most significant challenges during CP5 are the delivery of works relating to Crossrail, the delivery of level crossings safety improvements and the migration of signalling operations to the new route operating centre at Romford. The route sees potential opportunities for deep alliances arising from the re-franchising of Greater Anglia and Essex Thameside. Maintenance and renewals for buildings is already part of the Greater Anglia franchise.

8.186 The route's track plan addresses ageing S&C and poor track quality, with the primary aim being to deliver reliability on the high criticality routes and remove the risk of Temporary Speed Restrictions (TSRs) due to geometry faults and rough rides. An increased percentage of S&C units will be treated either by renewal or refurbishment. Re-railing volumes are slightly higher than modelled to address the high levels of rail defects on the route.

8.187 Proposed signalling work is driven primarily by NOS.

8.188 The route delivery plan contains significant civils renewals including works on major structures (for example swing bridges). The plan notes that full compliance with the new policy will not be achieved until CP6. Buildings work includes major roofing activity at Liverpool Street Station which will continue into CP6. Overall the route's station activity is lower than in CP4 because of the full maintenance and renewal leases awarded to the Greater Anglia franchise which has been assumed to continue when the current franchise is renewed in 2014.

8.189 The reliability of the overhead line equipment in Anglia is considered low and some substation components are being renewed due to obsolescence. A significant volume of lineside 650v signalling power supply equipment will be replaced. The route is continuing the re-wiring of 1940s overhead line equipment between Liverpool Street and Shenfield / Southend.

8.190 There are few major variations to the national asset policies. Track re-railing volumes in the first two years have been increased to address rolling contact fatigue on Essex Thameside and rail defects between Ely and Peterborough. In order to improve performance of overhead line equipment it is proposed to accelerate mid-life refurbishment of equipment on the West Anglia route from CP6 to CP5.

East Midlands

8.191 The East Midlands asset management plan is heavily influenced by two key issues: the development of a signalling workbank to deliver NOS and HLOS requirements, and the electrification of the route between Bedford, Corby, Nottingham and Sheffield. Implementation of NOS results in a significant acceleration of signalling renewals to facilitate major capacity schemes. The electrification of the route results in the requirement to carry out track lowering schemes, bridge reconstruction for gauge clearance and some advancement of renewals works in signalling and structures.

8.192 The route has deviated from policy in certain areas. All bridges will be included in the bridge painting and vegetation clearance programmes.

8.193 Rail renewal volumes are higher than required by policy, driven by the decision to remove all pre-1976 rail. (The rail manufacturing process used before 1976 resulted in rail which is far more prone to developing defects.)

Kent

8.194 Kent's route plan centres on the major challenges around delivery of the Thameslink programme and gaining sufficient access in order to carry out routine maintenance and renewals activities. This is an issue for the London Bridge area and for a number of works requiring high levels of access, such as Charing Cross and Cannon St bridges, Sevenoaks and Bo-Peep tunnels, S&C renewals programme, East Kent re-signalling project and power supply upgrade projects.

8.195 Track geometry in the Kent route has been below target recently due to a combination of drought conditions and insufficient track maintenance (such as tamping and stoneblowing activities). The route's track plans propose an increase in renewal, refurbishment and reballasting of S&C, particularly on the high criticality routes. No high output ballast cleaning is proposed. Plain line refurbishment will be in line with policy and will include removal of obsolete components. Rail renewal plans concentrate on the removal of old and defective rail on the New Cross Gate to Norwood route which sees an increase in tonnage.

8.196 Kent's structures proposals are driven by bridge expenditure including schemes at the major bridges of Charing Cross and Cannon Street. Earthworks are also an issue for the Kent route: the plan reports that 6% of its 478 miles of earthworks are classified as 'poor'. The Kent route also has to deal with the problem of summer shrinkage on clay embankments, which can cause track quality problems.

8.197 Kent is seeking to replace structures which support the rails on longitudinal timbers where there is a business case as they present a maintenance challenge. Signalling renewals are being heavily driven by the Thameslink programme, NOS and migration of control to the new ROCs.

8.198 The route plan does not include any significant variations from the national asset policies.

LNE

8.199 The LNE route asset management plan is dominated by renewal requirements in track, signalling and civils. The track plan incorporates a degree of asset rationalisation and supports the central policy with a shift from renewal to refurbishment depending upon criticality. A significant increase in S&C renewal

interventions is planned, including in the Doncaster and Colton areas. The route plan includes replacement of all pre-1976 rail on high criticality (criticality band 1) lines.

8.200 For signalling, the plan sees the introduction of ETCS on the south end of the East Coast Main Line (ECML) together with a number of renewals and re-controls that will be delivered in line with the NOS strategy.

8.201 The route's plan for structures includes an increase in expenditure over previous control periods to address a backlog of work associated with earthworks and to address deficiencies in capability within the structures portfolio. The route plan identifies a significant issue with historic mineworkings which require continuing investigation and remediation to mitigate the risk.

8.202 The route has proposed additional investment in earthworks beyond the level required by CP5 policy. This is to improve overall asset condition of the asset base to a sustainable level before fully implementing the new policy.

8.203 For electrification and plant, the route is planning to install additional signalling power supply back-up at key locations on the ECML and to replace signalling power cables to improve overall reliability. Additional drainage works over and above asset policy requirements are proposed to reduce operational risk. In addition, the route anticipates accelerating re-wiring of overhead line equipment where delivery efficiencies can be achieved alongside power supply enhancement works.

LNW

8.204 The LNW route plan includes extensive re-signalling work, including at Birmingham New Street, Watford and Wolverhampton. It proposes in-sourcing of repetitive civil structures inspections.

8.205 The plan proposes variance from the asset policies in a number of areas. This includes acceleration of renewals in several asset categories to align with proposed enhancements. For track assets the route will not remove all pre-1976 rail before the end of CP5. For civils it proposes: waterproofing of underbridges where track and formation renewals are being undertaken; improved drainage maintenance access; accelerated replacement of long timber bridges to deliver a modern structure supporting conventional ballasted track; and enhanced bridge strike mitigation measures. For buildings assets the route proposes enhanced measures to reduce energy consumption at stations, a programme of platform reconstructions to address

variance to stepping distance standards and rationalisation of route accommodation. For electrification and plant it proposes some rationalisation and removal of obsolescent assets.

Scotland

8.206 The Scotland route asset management plan is dominated by renewal requirements in track, signalling and civils. Its plans for track include the introduction of high and medium output plant on the ECML and WCML, renewal of slab track in Queen Street Tunnel and increased volumes of off-track work. Its plans for signalling include the migration of Motherwell Signalling Centre to the West of Scotland Signalling Centre and development work associated with deployment of ETCS in CP6. Its plans for civils renewals are based on the remediation of high risk assets for which condition is poor and has been deteriorating in CP4. The civils plan for Scotland includes approximately £40m on major structures, which is approximately 40% of the network total expenditure on major structures. In the Scottish route this work is dominated by the ongoing painting and refurbishment of the Tay Bridge, new work to the Clyde Bridge and routine maintenance to the Forth Bridge which will be necessary despite the completion in CP4 of the major refurbishment work.

8.207 The plan includes some variances to asset policy and, in some cases, reflects changes to route criticality classifications based on their importance to the Scottish network. For track the route proposes higher volumes of sleeper renewal to address non-standard sleepers on high speed routes. The route's signalling plans include renewal of the signal box at Carnoustie driven by the need to renew the adjacent level crossing. For civils the route has included plans to provide slope protection netting on all tunnel approaches and to address legacy issues associated with mining. For electrification and plant the plan includes some advancement of signalling power feeder cable renewals.

Sussex

8.208 The Thameslink enhancement is a key focus of activity on the Sussex route. The condition of the track, signalling and electrification assets on the route has progressively worsened over time to the point where performance is below the PPM targets and reliability is not sufficient to meet the existing timetable. The route is proposing to increase refurbishment of track assets, in particular carrying out more ballast cleaning. It proposes to increase remote condition monitoring to enable

maintenance work to be carried out on a more predictive basis. Some signalling work is being accelerated from CP6 to CP5 as a result of the NOS programme.

8.209 For track the volumes of work are in line with central policy, except where life extension of the asset is not deemed to be whole life cost effective. Sussex has proposed to increase the use of high performance rail in preparation for the Thameslink services from 2018. There are no other significant variances from the central asset policies.

8.210 The Sussex plan includes a significant increase in replacement of metallic structures driven by the high proportion of this type of structure on the route, many of which are over a hundred years old and in need of modern replacement. Proposed earthworks volumes are above network average reflecting the unsatisfactory state of clay embankments on the route, which has a direct link to track quality.

8.211 The Sussex route plan has been built around improving reliability for Thameslink services, with increased traffic levels, an aging asset and reduced access time. There is a focus on re-railing to reduce the pre-1976 rail and manage increased levels of rail defects on the route.

Wales

8.212 The Wales route asset management plan is dominated by renewal requirements in track, signalling and civils as part of a 15 year vision for overhauling its asset base. The route plan is significantly affected by new electrification which is driving bridge reconstructions at various locations and significant signalling renewals in the Welsh Valleys and Port Talbot area, aligning with NOS.

8.213 The signalling plan includes the completion of the Cardiff area signalling renewals and the renewal of the Shrewsbury-Newport and Chester-Llandudno sections which will be delivered in line with the NOS business case for centralising control. The route is coordinating track renewals with re-signalling work to maximise efficiencies in terms of design, capability and access.

8.214 No variances to asset policy have been highlighted within the Wales plans other than the acceleration of activities to coordinate renewal interventions with enhancements.

Wessex

8.215 The Wessex route asset management plan is largely focused on condition based renewals. The route's track condition remains the key area of work for CP5 with rolling

contact fatigue and the general condition of S&C presenting key challenges. Waterloo, the major terminal on this route, will be the focus of various activities with around a quarter of S&C refurbishment taking place in the Waterloo area. Re-signalling of Feltham is the only condition based signalling scheme with the remainder of the signalling work being integrated with NOS. Some enhancements to power supply will be needed to accommodate 10-car operations, but on the whole electrical power and fixed plant assets will follow the national condition based renewals approach. Resilience of assets remains an area of concern and Wessex aims to address this by, for example, introducing dual end fed signalling power systems in critical areas. Wessex is susceptible to risk from heavy rainfall and has focused on drainage as a key risk with respect to both track and earthworks assets. Its structures plans include the removal of higher risk asset types (cast iron and long timbered bridges) over and above the requirements of the policy.

8.216 Although there is no variation to the national track asset policy noted, re-railing is expected to be higher than that modelled centrally due to a number of factors including: volume of pre-1976 rail, excessive side wear on tight curves and the impact of historical tonnage assumptions. For stations, there are two variations to policy noted: maintaining building elements instead of renewal (e.g. lattice girder footbridges and trestle platforms); and life extension of lineside buildings instead of renewal.

Western

8.217 Renewals investment on the Western route is dominated by track, signalling and civils. The plan is significantly affected by major enhancements schemes. Crossrail generates the need for accelerated track renewals between Paddington and Maidenhead to cope with significant increased tonnage. New electrification drives bridge reconstructions and significant signalling renewals in alignment with NOS. In addition significant work is proposed for the Bristol area to coordinate renewal activities and to deliver the capacity requirements outlined in the HLOS.

8.218 Track volumes are in line with policy, targeting pre-1976 rail replacement and ageing S&C on critical routes. Heavier weight rail (CEN 60) will be installed on high criticality routes with increased traffic.

8.219 Structure volumes are being driven by the need to address assets in very poor condition as part of a risk prioritised recovery plan over two control periods. The Western route continues to have difficulties with earthworks reliability and has the

highest proportion in the 'poor' category (9% compared with the network figure of 5%). This is reflected in the planned expenditure on earthworks.

8.220 The plan includes some variance to asset policy where renewal activities have been accelerated to coordinate with enhancements. The structures plan includes works to address known issues with a specific bridge type (box girder bridges) and to develop a longer term strategy for coastal defences in Devon, particularly the high profile Dawlish sea wall. Western has a high proportion of issues with historic mining activities, principally Cornish tin mining and the plan includes continuation of a rolling programme to deal with this legacy.

Our assessment methodology – maintenance and renewals

8.221 In July 2011 we consulted on our proposed methodology for the assessment of Network Rail's plans. After consideration of the responses we refined our methodology, developing workstreams to focus on:

(a) asset management capability;

(b) asset policies;

(c) asset data;

(d) unit costs (pre-efficient);

(e) planning - modelling and workbank development; and

(f) efficiency.

Each of these areas is discussed in the subsequent sections of this chapter.

8.222 Prior to the submission of the SBP we, and the independent reporters, engaged with Network Rail to understand the process it was adopting in developing its plans by route and to allow early review of them where practical. We called this engagement 'progressive assurance'. Progressive assurance provided some early sight of the process being adopted but did not provide the opportunities for early review which were originally envisaged as Network Rail did not submit the expected level of evidence in advance of the SBP and provided limited engagement with the routes prior to its submission.

8.223 In our assessment of the SBP we have separately considered:

(a) the volumes and level of expenditure required to deliver the required outputs, before further efficiencies in CP5; and

(b) the efficiency available in CP5 and therefore the efficient level of expenditure in CP5.

8.224 We have assessed all stages of the development of Network Rail's plans through the detailed review by our engineering experts and through independent reporter work. Figures 8.5 and 8.6 show our interpretation of the high level processes Network Rail has used in developing its maintenance and renewals plans, with colour coding applied to show our assessment process. The colour of each box in the diagrams indicates the reporter study which reviews it. The diagrams are intended to give an overview and do not show the full complexity of the processes adopted or review and feedback loops.

8.225 Both Figure 8.5 and 8.6 show our assessment of Network Rail's plans in four areas:

(a) the development of its CP5 asset policies;

(b) the central modelling of volumes and costs (including efficiencies) associated with implementing those policies;

(c) the route based development of volumes and costs (including efficiencies) associated with implementing those policies; and

(d) the development of Network Rail's submitted SBP.

8.226 Figure 8.5 shows that, for maintenance, policy development and central modelling has been carried out, but our assessment has found insufficient evidence of how these areas of work have fed into the final SBP submission. In particular, the line of sight between asset policies and maintenance plans presented in the SBP is not clear. The maintenance plans are largely based on projections of resource requirements that have not been demonstrated to be aligned with policy requirements. There has been limited challenge between centrally modelled cost and resource based cost forecasts. Network Rail has not demonstrated a robust route challenge to centrally derived efficiency initiatives.

8.227 Figure 8.6 shows that renewals plans are developed based on the requirements of asset policies. Asset policies are based on whole life cost modelling and rely on understanding of unit costs, degradation and the impact of interventions. They also

rely on specification of the outputs which they are intended to deliver. We have some concerns over the specification of outputs, discussed later.

8.228 For renewals, asset policies have generally been demonstrated to feed into both central modelling and route based plans. In both cases the volumes and costs associated with implementation of the policies are developed using understanding of the asset base (for example, the number of assets and their condition), cost information (including unit costs of work activities), understanding of degradation and efficiency initiatives. We have seen evidence of a challenge process between central and route based plans in all aspects of the planning process. The final SBP submission is a result of that challenge process.

Figures 8.5: Our assessment of Network Rail's maintenance plans

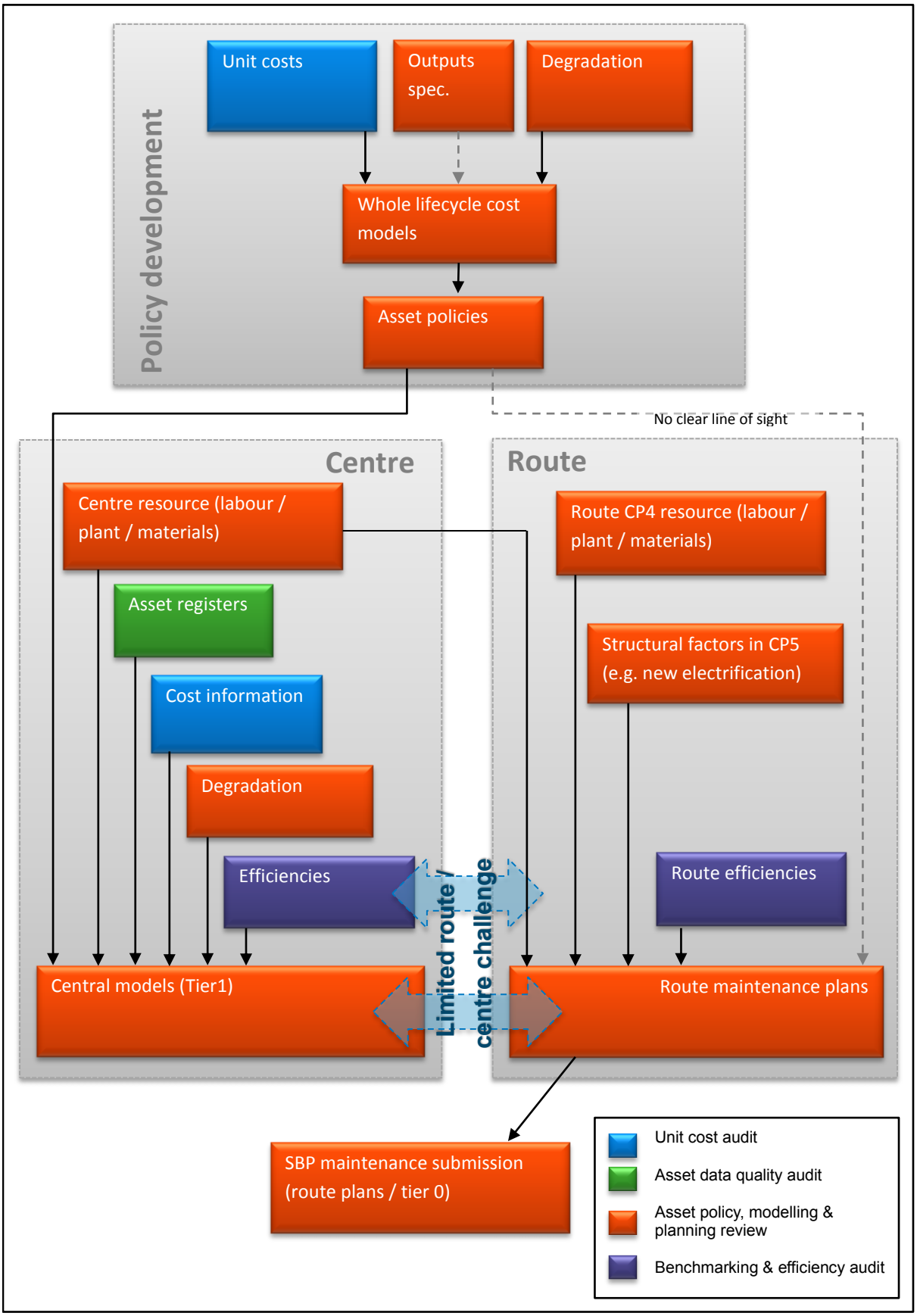
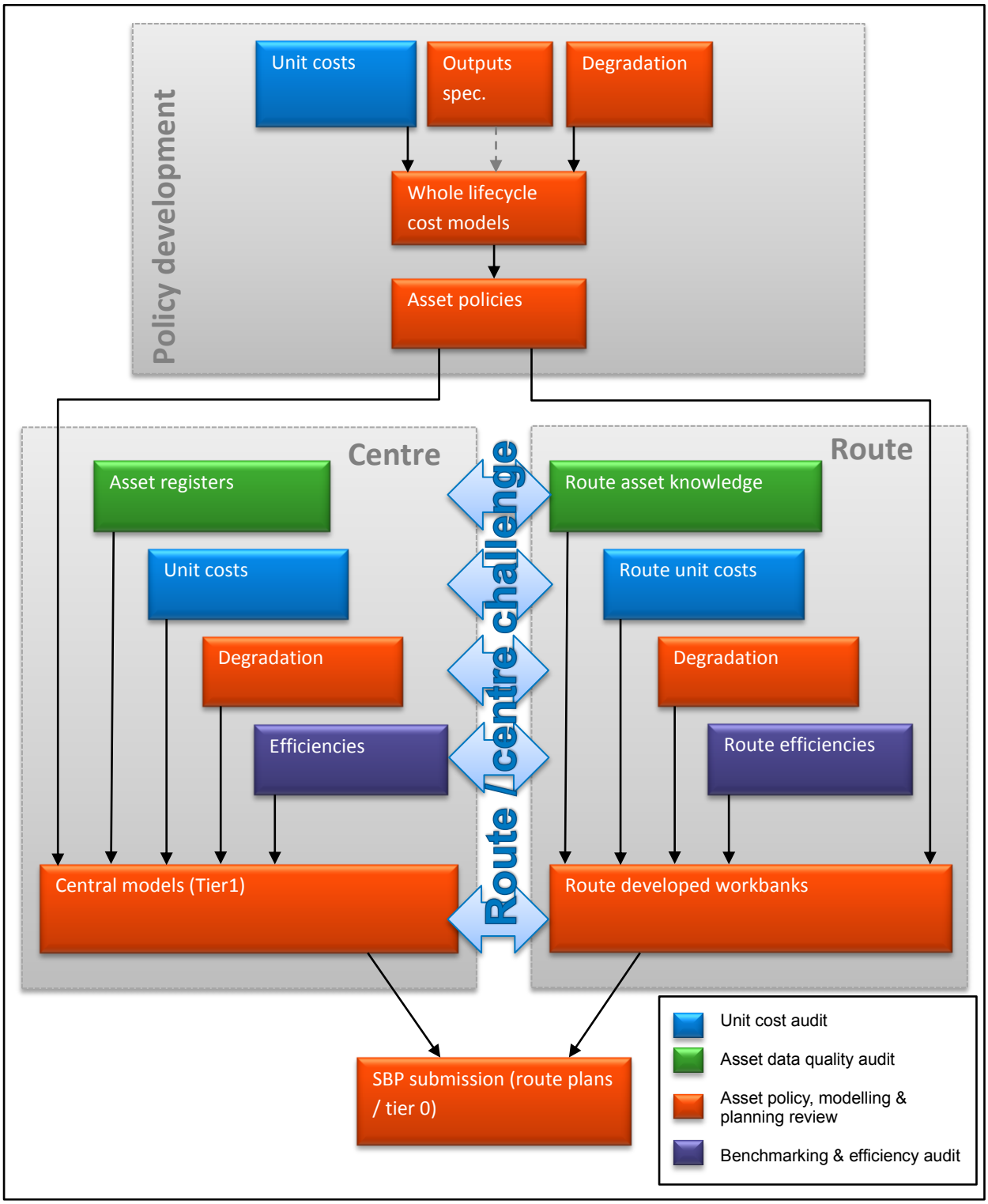


Figure 8.6: Our assessment of Network Rail's renewals plans

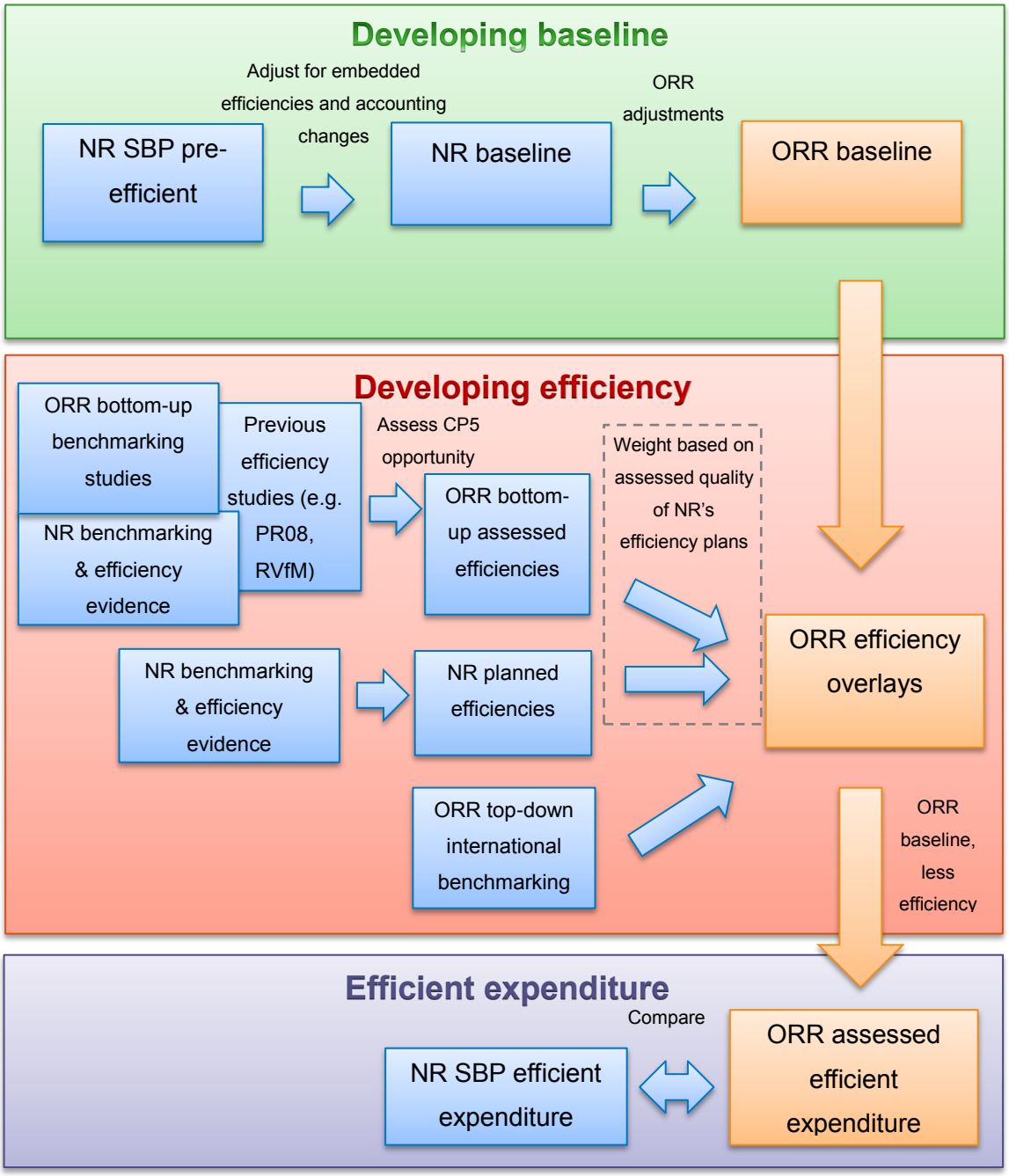


8.229 As well as auditing Network Rail's development of its plans we have carried out our own assessment of the efficiencies that are available through improved asset management. This is discussed in detail later in the chapter.

8.230 Where our review has found material issues with Network Rail's planning process that are likely to lead to a bias in its forecast costs and volumes we have made adjustments to reflect this.

8.231 Figure 8.7, below, gives an overview of the approach adopted.

Figure 8.7: Our approach to developing our assessed efficient maintenance and renewal expenditure



Developing the ORR baseline

8.232 Network Rail's pre-efficient plans are presented on the basis of applying its new asset policies and unit costs as at the end of CP4. In some cases its new policies are considered to be more efficient than current practice, requiring less work to be done to give the same outputs. These efficiencies are embedded in the new policies and are referred to as 'embedded efficiencies'. Since these are efficiencies that Network Rail proposes will be delivered in CP5 we have adjusted the pre-efficient plans to recognise them and generate a 'Network Rail baseline'.

8.233 We have made adjustments to the Network Rail baseline where we do not consider that it accurately reflects the costs associated with continued application of CP4 policies and the end-of-CP4 level of efficiencies. For example we have made adjustments where we believe that its end-of-CP4 unit costs are inaccurate. These adjustments generate an 'ORR baseline'.

Developing the ORR efficiency overlay

8.234 Our efficiency overlay is influenced by the studies that we have commissioned in PR13, our review of all previous efficiency studies, our top-down benchmarking and our view of the robustness of Network Rail's benchmarking and efficiency evidence, informed by the independent reporter's audit.

8.235 In developing our final view of the efficiency overlay we have weighted the results of our bottom-up efficiency analysis and Network Rail's efficiency analysis based on our assessment of the quality of the company's benchmarking and efficiency work. This draws on the outputs of the independent reporter's audit. Where we have more confidence in Network Rail's efficiency projections (for example where we think its benchmarking has been comprehensive, robust and there is transparency in how this has informed its SBP efficiencies) we have applied more weight to its view of efficiency. Where Network Rail's efficiency plans are considered weaker (for example where we think that benchmarking is less comprehensive or where there is a less transparent link between benchmarking and SBP efficiencies) we have applied more weight to our analysis.

8.236 Finally, we have reviewed the efficiency overlay against the range of efficiencies produced by our top-down international benchmarking.

Developing ORR assessed efficient expenditure

8.237 We have applied our view of the efficiency available during CP5 to the ORR baseline to produce our ORR assessed efficient expenditure. This can be directly compared with Network Rail's efficient expenditure (or 'post-efficient' expenditure) as set out in its SBP.

Our assessment of route plans

8.238 We and the independent reporters, Arup and AMCL, have carried out a detailed assessment of plans by operating route. The assessment has included:

(a) review of the route specific SBP submissions, including route plans and disaggregated costs and volumes data;

(b) review of the SBP development process adopted, including the development of central modelled plans and route-based plans, and their influence on the submitted SBP;

(c) ten overarching route based challenge meetings: one with each of the ten operating route management teams; and

(d) 34 meetings to assess the development of asset management plans in the routes.

Interoperability

8.239 Interoperability is a European Commission initiative to promote a single market in the rail sector, which includes making it easier for trains to travel across different rail networks. This is partly achieved through common specifications called Technical Specifications for Interoperability (TSIs). Statutory requirements for interoperability are set out in The Railways (Interoperability) Regulations 2011.

8.240 The SBP included the assumption that planning for an interoperable railway would not require specific additional costs in CP5 beyond existing levels of capital expenditure. Network Rail's planned expenditure for maintenance, renewal and enhancements is assumed sufficient to meet the requirements of the interoperability regulations and the TSIs, and therefore our determination is also on this basis.

Our assessment by workstream

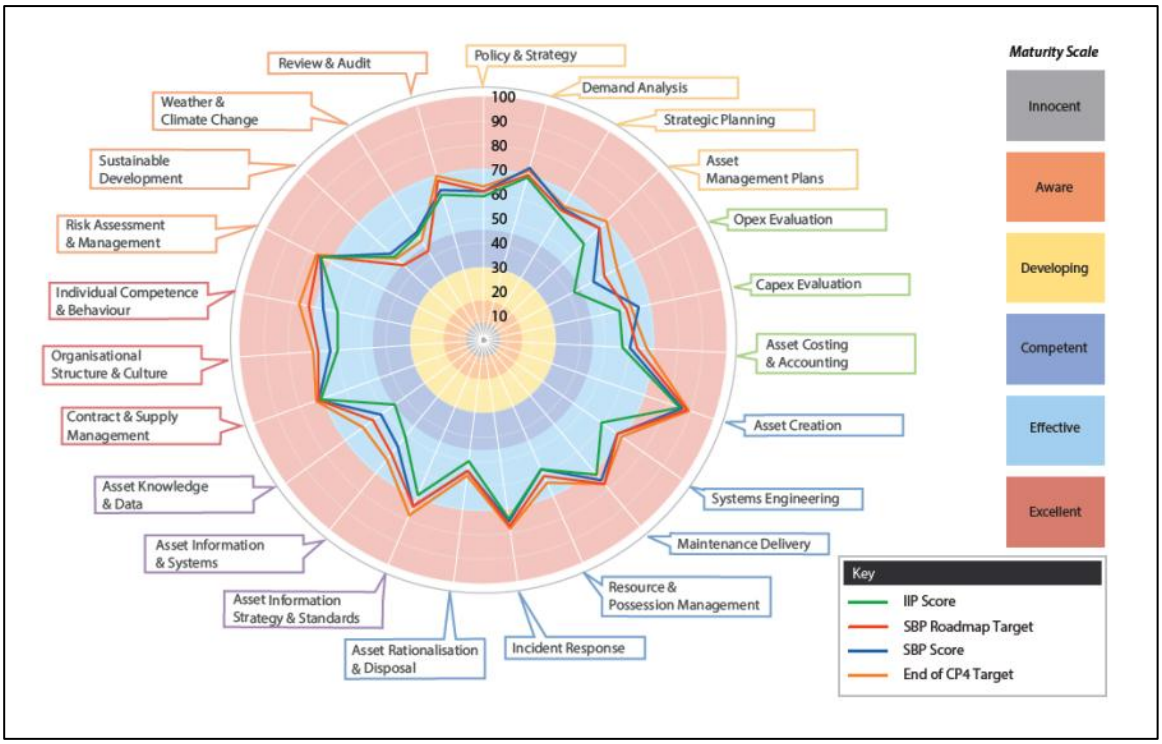
8.241 The rest of this chapter sets out the findings of our review and our conclusions. First it sets out our overarching findings against the workstreams listed in paragraph 8.221 and then it provides detail by asset category and route.

Asset management capability

8.242 During CP4 we set targets for Network Rail to improve its asset management capability by the end of CP4, including milestones at publication of the IIP and at publication of the SBP. Network Rail has not fully delivered against these milestones, but has nonetheless made significant improvement in its capability and has achieved PAS55 certification (the standard that denotes it has reached a level of good practice).

8.243 Figure 8.8 shows Network Rail's assessed asset management capability at the time of the SBP submission as measured by AMEM[133]. Asset management capability is measured for each of 23 key activities, with lower scores (closer to the centre of the circle) representing lower asset management capability maturity and higher scores (closer to the perimeter of the circle) representing higher asset management capability maturity.

Figure 8.8: Network Rail's asset management capability at SBP submission as measured by AMEM



8.244 The AMEM findings show that Network Rail has further improvements to make in some key areas of asset management to reach its end-of-CP4 target. At the time of

[133] *2013 SBP AMEM Assessment*, AMCL, May 2013, available at: http://www.rail-reg.gov.uk/pr13/publications/consultants-reports.php

the SBP submission it was significantly behind its targets in opex evaluation (i.e. the justification of maintenance interventions based on analysis of cost and risk), asset costing and accounting, resource and possession management, asset information and systems, asset knowledge and data, organisational structure and culture, individual competence and behaviour, and review and audit.

8.245 The AMEM findings provide strong support to our assessment of Network Rail's plans and the areas in which further efficiencies might be available. Further improvements in its asset management capability will be key to enabling efficiency improvements in CP5. We have set asset management capability targets as regulated outputs as discussed in chapter 3.

8.246 We discuss Network Rail's approach to asset management in more detail below, including by asset type and route.

Asset policies

8.247 We have carried out a detailed review of Network Rail's asset policies and their justification. We have set out our framework for reviewing asset policy, including tests of robustness, sustainability, efficiency (of policy, in terms of minimum whole life, whole industry cost (abbreviated to 'whole life cost' in this document)) and further tests of alignment with good practice, consistent with PAS 55.

8.248 In assessing robustness we consider whether it is reasonable to believe that the asset policy can deliver the required outputs, for England & Wales and Scotland in CP5.

8.249 Our assessment of sustainability considers whether, if demand on the network were to remain steady, the application of the asset policy would continue to deliver the outputs specified indefinitely. A sustainable asset policy is one which delivers (at least) the agreed outputs for the final year of the control period in the long-term (to at least end of CP11) if demand on the system remains within the capacity limits of the current network and any enhancement schemes already committed to by industry. In assessing sustainability we have carried out a detailed review of Network Rail's long-term modelling of policy and outputs, either through long-term workbanks or strategic planning models. This test is important to ensure that, in managing its assets, Network Rail is making genuine efficiencies and is not deferring essential work at the cost of inefficiently higher expenditure in later control periods.

8.250 Our assessment of the efficiency of asset policies considers whether they have been demonstrated to deliver the required outputs both in the short and long-term at lowest possible whole system cost over the lifetime of the assets. In assessing minimum whole life cost we have considered whether both scope and unit cost efficiencies have been fully considered.

8.251 Network Rail has made significant progress in developing and justifying its policies. In particular it has, for the first time, produced a suite of tools to support its development of minimum whole life cost asset policy. The tools are considered to be comparable to or at the frontier of best practice.

8.252 Network Rail has significantly reworked its policies, presenting them in a ten stage process, in line with best practice as recommended by the asset management independent reporter, AMCL. They show a step-change in quality and coverage. New policies have been developed in key areas and existing policies have been refined where previously mature (for example, track) or rewritten where known to be poor (as is the case for civil structures policy).

8.253 The CP5 policies reflect a further move towards the differentiation of asset interventions depending on the asset's criticality, and therefore better target expenditure on the basis of risk. They also move towards a more targeted approach to asset management, renewing only those components that require renewal where this is believed to be the most cost effective whole life approach.

8.254 Although Network Rail has made significant progress in the development and justification of its asset policies we consider that some areas of weakness remain. Deficiencies in Network Rail's asset knowledge limit its ability to demonstrate that its policies are fully optimised. Network Rail still does not have asset data knowledge of sufficient quality, in particular relating to asset degradation. Its knowledge of asset unit costs and application for the purposes of planning is currently not of sufficient quality to provide certainty in its proposed asset policies and in its planned expenditure in CP5.

8.255 Network Rail has not optimised management of its assets across asset types. It has not considered whether network performance might be delivered better through a different mix of performance at the asset category level. The company has not

demonstrated that it understands the relationship between its asset management plans and high level outputs such as PPM.

8.256 Network Rail's application of its CP5 asset policies in its planning is varied. For maintenance there is limited evidence of its policies feeding into its SBP submissions. For renewals the application of policy is generally stronger for track, signalling and electrical power and fixed plant. It is weaker for civils and buildings. We discuss this in more detail in our assessment by asset type.

Asset data

8.257 The quality of asset management planning is entirely dependent on the quality of information held about the assets, and the asset system more widely. We have expressed serious concern about aspects of Network Rail's asset information systems and data quality management and have pressed for improvement. Network Rail has recognised the need for improvement. It has undertaken a programme of work, the Asset Data Improvement Programme (ADIP), to enhance the accuracy and currency of its asset information. Improvements have been prioritised to support development of the SBP and to support effective and safe maintenance of the railway. Network Rail has also set out its longer term strategy for developing asset information management capability in its ORBIS plans. This programme of works is intended to change the way in which asset information is collected, stored and used, with the aim of improving railway safety, efficiency and capability.

8.258 We mandated the independent reporter, Arup, to conduct an extensive audit of Network Rail's asset data processes and resulting data quality, in part to understand the implications for the quality of the company's plans for CP5[134]. This audit has given us and Network Rail a more comprehensive understanding of the company's asset information systems, the quality of the processes through which asset information is maintained and the completeness and accuracy of the data held. The reporter separately audited:

(a) Network Rail's data governance and capture processes; and

(b) the actual data held, assessing its completeness and accuracy.

[134] *Audit of asset data quality*, Arup, May 2013, available at http://www.rail-reg.gov.uk/pr13/publications/consultants-reports.php

8.259 The audit found some areas of good practice in Network Rail's data management. Data governance was generally found to be good, but it was noted that processes have been implemented recently and may not yet have impacted on currently held data. Data capture and entry processes were found to be sound for centrally managed data systems and consistency was found in the datasets used centrally and by routes in developing the SBP. The delivery unit teams were able to demonstrate good local data management through the System Support Manager role and the use of Ellipse as the primary asset management system. The completeness and accuracy of data held was found to be relatively better for plain line track, operational property, signalling interlockings, level crossings and overhead line equipment.

8.260 The audit also found aspects of data management that were poor and which represent key areas of concern. The completeness and accuracy of data held was found to be poor for civil structures and conductor rail. (Subsequently Network Rail has been working to improve civils data.) Local data governance was found to lack formal process. Some local databases were not integrated to ensure consistency and efficiency. Route teams were found to be adopting inconsistent approaches to reviewing and verifying data quality.

8.261 Going forwards it is essential that Network Rail is able to demonstrate that it understands its asset information requirements, has the systems and processes in place to deliver those requirements and is auditing the quality of asset information held. Through the ADIP and ORBIS programmes it is developing these areas and we will monitor its progress closely. We have set out how we plan to monitor asset information quality in chapter 3.

8.262 The quality of asset information affects our view of the robustness of Network Rail's plans. For example, poor quality information may lead to inefficient targeting of work, inappropriate prioritisation of workbanks and uncertainty over the scope of work required. Our efficiency analysis has considered the efficiencies which might be available from improved asset information.

Unit costs

8.263 It is essential that Network Rail has a robust unit cost framework in place for both maintenance and renewals. A complete, up-to-date and accurate set of unit costs enables accurate business planning, more reliable benchmarking of costs, identification of efficiency opportunities, demonstration of achieved efficiencies and

development of asset policies that minimise the whole life cost of managing Network Rail's assets.

8.264 We have assessed Network Rail's unit cost frameworks for maintenance and renewal looking at both the quality of reported data, and the processes by which these data are used to develop a forecast of unit costs for the purposes of planning.

8.265 In May 2011, we wrote to Network Rail[135] to set out our expectations for its unit cost framework at SBP in terms of system reliability, accuracy and coverage. We stated a requirement for both maintenance and renewal related unit costs to achieve a confidence grading of A2 at the time of submission of the SBP. The company has put a substantial amount of work into improving its capture and reporting of unit costs. We have, through the independent reporter Arup, audited Network Rail's unit cost framework at SBP[136]. The company has not yet achieved the level of system reliability that was expected. Arup gave Network Rail's unit costs relating to renewals a confidence grading of B2. It found that the cost analysis framework (CAF), through which the majority of unit costs relating to renewals are captured, does not appear to capture all project costs for certain asset categories through the GRIP stages. In addition the company has not demonstrated that its maintenance unit costs were at confidence A2 at the time of submission of the SBP. This has implications for the robustness of Network Rail's policy development, planning, benchmarking and its ability to demonstrate realisation of efficiencies.

8.266 Further to the above audit of actual (delivered) unit costs we have also audited, through the independent reporter Arup, the quality of the unit cost information which has been used in developing the SBP. This may be different to actual unit costs for reasons including: further efficiencies to the end of CP4; new work types projected for CP5; and better information about future unit costs (for example information from new contract placements).

8.267 For all asset types Network Rail's plans are based on a mixture of unitised costs, non-unitised costs and project cost estimates. Unitised costs are used to develop plans covering 44% of maintenance and renewal expenditure. For maintenance, none of the

[135] http://www.rail-reg.gov.uk/upload/pdf/unit_costs_letter-090511.pdf

[136] PR13 review of Network Rail's maintenance and renewal unit costs used in planning, Arup, May 2013, available at http://www.rail-reg.gov.uk/pr13/publications/consultants-reports.php

plans is based on unitised costs. Of the renewals expenditure plans roughly 61% is based on unitised costs, 30% is based on non-unitised costs and 9% is based on project cost estimates. Generally, more certainty can be attributed to those areas of expenditure where Network Rail has forecast expenditure on the basis of required volumes and costs, or on the basis of well-developed project cost estimates. There is generally less certainty where forecast expenditure is based on historic costs rolled forward.

8.268 Network Rail has not directly used its collected maintenance unit costs in its planning for CP5. Its maintenance plans have been developed on the basis of historical levels of resource expenditure and not through the quantification of types of work and their cost of delivery. It carried out some central modelling of volumes and associated costs for the IIP, but there has not been any clear demonstration that this has been used to develop or evaluate the costs presented in the SBP. The limited use of historical maintenance unit costs in the development and validation of Network Rail's plans is disappointing and, because plans are not based on volumes and types of work activity, the line of sight from optimised policy to planned expenditure is not clear.

8.269 Network Rail has used its historical unit costs relating to renewal to varying degrees in developing its renewals plans. For some assets its plans are largely based on historical unit costs (for example track, earthworks and drainage). For other asset categories it has priced elements of its work activities based on labour, plant and materials costs using estimating techniques (for example, electrification and power, and buildings). For signalling the unit costs used are based on average framework signalling unit rates with a number of Network Rail overlays. In all cases factors have been applied to generate the all-in unit cost at the end of CP4. We are concerned that the systems currently being used for the capture of unit costs are not currently capturing them at an appropriate level, using a cost breakdown structure that reflects the requirements of the business planning process.

8.270 Arup has identified some key concerns with the unit costs and non-unitised projections used. Where expenditure is based on rolling forward non-unitised costs there is high potential for over-forecasting of expenditure. The process used for challenge of plans has focused effort on justifying expenditure which is greater than run-rate, and has not placed enough emphasis on justifying a continuation of historical levels of expenditure. For unitised costs based on historical spend there is potential

for costs to vary due to the underlying mix of work types, for example where historical volumes of a work type are considerably different to those projected. Network Rail has not provided any evidence of analysis to assess the effect of these issues. For all unit costs there is concern that the level of risk, contingency and management overhead costs have not been given adequate oversight at the programme or portfolio level. This has high potential to lead to an overestimate of risk and contingency. Findings by asset category are presented below.

8.271 We consider that further efficiencies can be achieved through a more robust understanding of unit costs, optimising the performance and cost trade-off, optimising asset policies, using the information to inform better supply chain management and understanding better where efficiencies might be achieved through comparative analysis.

Modelling and workbank development

8.272 Network Rail's plans are built up either by forecasting the volumes of work required or resource requirements, and projecting associated costs. This forecasting is carried out both centrally, using strategic planning models, and by the development of route workbanks.

8.273 Strategic planning models forecast expenditure in two ways: based on volumes of work multiplied by unit costs (unitised); and based on extrapolation of historical costs (non-unitised).

8.274 Volume based modelling uses current information held about the assets, forecasts the assets' degradation and applies interventions, as set out in its asset policies, to forecast the volume of work required. It then applies unit costs to forecast expenditure requirements. Modelling based on extrapolation of historical costs is a more basic approach but is appropriate where there are no clearly defined repeated work types or where the run-rate of expenditure gives a more accurate forecast of future expenditure.

8.275 The independent reporters, Arup and AMCL, have audited Network Rail's strategic planning models for all asset categories, assessing:

(a) input data (are the input data consistent with asset data registers, degradation modelling and unit cost modelling?);

(b) computational accuracy (do they function as intended?);

(c) modelling principles (are they modelling policy accurately?);

(d) model uncertainty (what is the range of uncertainty in modelled outputs?); and

(e) model outputs (are the outputs accurate and are they fed through to the SBP submission?)

8.276 The audits found that modelling varied by asset category, including the extent to which the modelling represented application of asset policy. There was wide variation in certainty of inputs and outputs. Computational accuracy was, in general, found to be good. Our key concerns are:

(a) the quality of maintenance modelling and the extent to which it has been used in development of the SBP submission;

(b) civils structures modelling of asset policy, its inputs and therefore outputs;

(c) franchised station modelling of asset policy, its unit cost and degradation inputs; and

(d) fencing modelling of asset policy and inventory input data.

8.277 We present our modelling findings in more detail in our review by asset type.

Our assessment of route plan development

8.278 We have seen evidence of a challenge process between centrally modelled plans and route based plans, but the strength of this varies between asset groups. For example, challenge of track plans has been relatively good, whereas for buildings we have seen limited evidence of routes challenging centrally modelled numbers. Despite this variability, the process implemented has worked to improve the quality of plans by operating route.

8.279 Both modelling and route based plans are built on route specific asset information and unit costs which, to some extent, reflect the structural factors in routes.

8.280 In some instances routes have used route-specific unit costs and efficiencies where they believe they have better local information. Routes have considered local constraints in their plans.

8.281 Overall we consider that Network Rail has applied a suitable process for the development of route plans. However the late running of the process has led to some

inconsistencies in plans. Robustness of plans by route is still dependent on accurate route based unit costs. These vary significantly in quality and they are not yet tested.

Climate change and resilience

8.282 An overarching consideration in our assessment of Network Rail's maintenance and renewal plans has been the extent to which they have addressed climate change and resilience of the network both in the short- and long-term.

8.283 Network Rail, in conjunction with RSSB, has undertaken extensive research to understand likely future climate change scenarios and has led the industry's initial response to the Climate Change Act 2008.

8.284 Whilst it is clear that Network Rail has developed its understanding of the impact of climate change on some elements of its infrastructure it is imperative that this understanding is developed further for all assets and, in particular, for earthworks and drainage. We therefore require Network Rail to update its Climate and Weather Resilience document to include a strategic review of the key nodes in its network. The updated document must demonstrate how Network Rail has assessed the risk associated with climate change at those key nodes and how it has assessed the need for measures to improve their resilience. For example, it should consider whether it is economic to provide flood protection at critical locations and, if not, what measures should be taken to ensure that the railway is recovered back into operational use as soon as reasonably practical in the event of flooding.

8.285 The CP5 asset policies generally contain improved consideration of climate change. However we have not seen evidence that these elements have been embedded in Network Rail's standards and specifications. Specific consideration needs to be given to:

(a) specification of new components / equipment / systems to provide robust performance for anticipated climate scenarios over the design life. For example, Network Rail might consider including projected climatic ranges in the specification of new systems such as overhead line, track and structures.

(b) evaluation of existing systems to identify and justify interventions to improve resilience to projected climate change. For example, Network Rail might consider increasing tension in overhead line systems to reduce the likelihood of

dewirement due to high wind speeds, or improvements to sea defences to mitigate changes in tidal reach.

(c) review and amendment of existing operating and maintenance practices to improve mitigation of the impact of climate change. For example, Network Rail might review its maintenance practices to improve management of climate driven failure modes or alter its stressing ranges for running rails.

Our assessment of maintenance and renewal efficiency

8.286 In developing our view of the overall potential for Network Rail to realise efficiencies in CP5 we have considered a wide range of evidence, including:

(a) Network Rail's benchmarking for PR13, which we have reviewed;

(b) benchmarking studies which we have commissioned for PR13;

(c) previous studies carried out, from which we have identified efficiency opportunities remaining at CP4 exit (including all PR08 work, RVfM study, reporter work and external studies);

(d) evidence from our engineering experts and safety audits;

(e) our overarching efficiency opportunities, relevant to all areas of expenditure (for example improved management of inflation); and

(f) our top-down econometric modelling, which uses mathematical techniques to benchmark Network Rail against comparators and assess how much more efficient it would need to be to match the best performers.

8.287 We summarise some of the key evidence considered below.

Maintenance and renewal efficiency – our studies

8.288 We have conducted a suite of benchmarking studies for PR13, including benchmarking against international comparators (both within and outside Europe) and comparators from other industries. Our studies have benchmarked asset management, possession management, supply chain management, project and programme management, innovation and maintenance strategy. All of these studies

have identified opportunities to realise further efficiencies during CP5. The reports are available on our website[137]. Some of their key findings are summarised below.

Asset management

8.289 The independent reporter, AMCL, has conducted an assessment of Network Rail's asset management capability as described earlier in the chapter. It has considered emerging evidence in comparable sectors to identify the efficiencies which might be realised in CP5 through improved asset management. The reporter estimates that Network Rail could identify 15 to 20% maintenance savings and 10 to 15% renewals savings from more risk-based renewal and maintenance interventions alone. It has also identified many opportunities to improve the planning and delivery of work which all have the potential to reduce the costs of engineering works over the lifetime of the assets.

8.290 We have separately commissioned a study by Civity to consider the scope of savings which might be available from better asset management. Civity's report draws on a range of evidence concerning Network Rail's asset management and supports many of the findings from the AMEM review. The report concludes that the range of potential savings is wide but is in line with the findings of the RVfM study.

Possession management, Lloyds Register Rail

8.291 We commissioned a study to benchmark the efficiencies which might be available during CP5 from the improved management of possessions. The study carried out benchmarking using six international comparators, including ones from North American, Asia and Australasia.

8.292 Six key themes were identified:

(a) delivery of engineering work: Network Rail's unit costs appear high. The gap to comparators has been measured across a wide range of studies as being between 10 and 40%, partly due to differences in engineering access;

(b) timing of engineering access: Network Rail relies largely on longer weekend possessions, whereas comparators were found to use overnight possessions in which dedicated, multi-skilled teams deliver repeatable maintenance and renewal activities. Some comparators extend track time through adjacent line

[137] http://www.rail-reg.gov.uk/pr13/publications/consultants-reports.php

open operation. Productivity, quality and unit costs are improved through use of a full time workforce. This approach has the potential to lead to substantially increased revenues;

(c) invest in maintainability: the study considers that Network Rail's approach to asset management has been characterised by lowest first cost and benefits could be realised from greater consideration of costs over the lifetime of assets. Comparators invest more heavily in infrastructure to provide improved train routing, faster isolation and low maintenance track. It highlights the opportunities presented by the ERTMS programme;

(d) planning processes: Network Rail books engineering possessions early, which results in more reworking of plans. Contractors are involved later, and pathing of engineering trains can also occur later. There are inconsistent links to the timetabling process. Devolution presents a big opportunity for improvements;

(e) contracting policy: Network Rail involves contractors late in the process resulting in late re-working of plans. It tenders work in smaller packages. Its contracting strategy has resulted in use of a casual workforce, resulting in lower quality, loss of learning and the requirement for more prescriptive safety processes; and

(f) possession management: Network Rail's productivity is comparatively low. It is slower at carrying out isolations and has more prescriptive safety rules which result in slower uptake and hand back of possessions. It plans for greater contingency, both in terms of the equipment required and time to hand back possessions and yet its possessions result in more disruption to services. Benchmarking suggests that Network Rail typically achieves 3.5 hours of productive time out of an 8 hour possession, whereas comparators typically achieve 6.5 hours.

8.293 The study suggests that the benefits potentially available from improved possession management are between £50m and £150m per year. It considers that benefits to the wider industry might be greater, resulting from increased revenues and reduced operational costs.

Supply chain management

8.294 Civity reviewed Network Rail's supply chain management against 'world class' practice and identified some significant gaps in capability. It found key areas for improved efficiency including:

(a) better workbank planning with improved smoothing and longer term visibility to give its supply chain greater opportunity to optimise its resource management;

(b) application of a more collaborative approach to supplier engagement;

(c) further standardisation and modularisation of assets;

(d) adoption of industrial processes to deliver work more efficiently;

(e) improved access arrangements and higher productivity;

(f) a leaner but higher skilled procurement function;

(g) further development of the cost database and unit cost modelling; and

(h) further benchmarking against international peers to identify efficiency opportunities.

8.295 Civity concluded that efficiencies of £300m to £400m per year might be achievable in CP5 from improved supply chain management.

Project and programme management, Halcrow

8.296 We commissioned Halcrow to review Network Rail's project and programme management capability and the efficiencies which might be available from improvement.

8.297 The following key opportunities were identified:

(a) a greater focus on programmes of work to understand system-wide issues and benefits – rather than a more narrow focus on projects;

(b) a greater focus on the development phase, reducing the time to develop schemes;

(c) a more collaborative approach in use of the supply chain, reducing the need for duplicated resource;

(d) a move to more output based procurement, allowing greater innovation in the supply chain;

(e) improved whole life cost analysis, particularly for new infrastructure, to optimise option selection for investment decisions;

(f) improved early estimating and improved analysis of changes in scheme costs through their lifecycle;

(g) reduced inefficiencies in managing projects and improved automation of reporting systems to reduce opex costs;

(h) improved project and programme management capability and therefore improved efficiency;

(i) improved transparency in project reporting; and

(j) application of best practice project and programme management across the business – including in maintenance and renewals.

8.298 The study identified that efficiencies were available in maintenance and renewals but did not quantify those savings. Many of the themes identified above are relevant to maintenance and / or renewals. We have taken this into account in our analysis.

Innovation

8.299 We commissioned Balfour Beatty RailKonsult to conduct a study into the efficiencies available to Network Rail from best practice innovation and the introduction of technologies which are new to the railway in Great Britain. The study separately considered: innovation process best practice; a scan of innovations applicable to rail; an assessment of the potential value of innovation during CP5. It recognised that much work has been undertaken in the last two years to improve the innovation process. Through its benchmarking RailKonsult identified significant opportunities for the rail industry to improve its innovation practice, including:

(a) setting clearer objectives;

(b) developing a long-term technology plan;

(c) simplifying industry interfaces;

(d) improving understanding of the link between research and development and return on investment;

(e) developing dedicated specialisms and centres of excellence; and

(f) reducing ‘fear of failure’ culture.

8.300 The study noted that the rail industry spends less on research and development than other industries.

8.301 The study identified a range of innovations which were either not included in Network Rail's business plans or for which it considered greater efficiencies could be realised. These included: mobile maintenance units, under-sleeper pads, staff protection systems, improved recycling of components, chemical treatment of timber bearers, improved system monitoring, non-intrusive crossovers, modular level crossings, improved use of ground penetrating radar technology, repadding machines, specialist gantries, plastic sleepers, improved modelling of bridge behaviour and new overhead line component technologies. An assessment of the potential benefits that might be available from implementation of these innovations in CP5 was carried out, concluding that the range was £57m to £113m.

Maintenance strategy

8.302 Potential to gain efficiencies by optimising maintenance strategy on the basis of risk has been identified by several previous studies. We commissioned Balfour Beatty RailKonsult and AMCL to carry out a benchmarking study to identify best practice maintenance strategy and the efficiencies which might be available through its adoption. This was informed by AMCL's extensive asset management best practice analysis and benchmarking, including international and cross-industry benchmarking.

8.303 The study identifies core themes for comparison of identified best practice with practice as currently seen in Network Rail: strategy and planning, decision making, asset knowledge, delivery planning, organisation and people, review and improvement. Key findings are: a formalised approach to Maintenance Requirements Analysis (MRA) is required; industry records need improving, particularly failure and reliability data to facilitate adoption of Failure Modes Effects and Criticality Analysis (FMECA) processes; there is opportunity for more automated condition monitoring equipment; resource planning could be improved; competencies need to be maintained to address industry change; and there remains scope to improve efficiency and quality in delivery of works, for example through adopting Lean and Six-Sigma approaches.

8.304 The study identifies that adoption of a risk based approach to inspection and maintenance has led to efficiencies of between 15 and 30% in comparator organisations. It assesses the scale of opportunities remaining for CP5 by asset

category, given the plans that Network Rail has in place. Further efficiencies are thought to be available in CP5 as follows: 10% for signalling assets, 7% for electrical power and plant assets, 10% for telecoms assets. No further efficiencies are identified for track beyond those plans already in place. No further efficiencies are identified for civil structures given the extensive work already underway to improve inspections (and civils asset management more widely) in CP4 and assumed to form part of Network Rail's SBP.

Maintenance and renewal efficiency – previous studies

8.305 In addition to studies which have been conducted as part of the PR13 process there is an extensive body of work which has been carried out previously. This includes consultant reports produced for the Rail Value for Money study, for PR08 and for other efficiency analyses. Many of the opportunities identified by these studies remain relevant; some are still to be addressed, some have been partially addressed and some have been fully implemented. We have carried out a systematic review of all PR08 and RVfM study documents to identify and catalogue all efficiency opportunities. We have used engineering consultants, RailKonsult, to assess the extent to which the opportunities identified will remain valid at the end of CP4, to quantify the remaining efficiency and to opine whether the full remaining efficiency could be achieved in CP5.

Maintenance and renewal efficiency – Network Rail's evidence

8.306 Network Rail has carried out benchmarking in support of its efficiency projections for CP5. We, supported by the independent reporter Arup, have audited this benchmarking. Our findings are set out by main asset category in the section that follows. The key overarching findings are set out here.

8.307 Network Rail's programme of benchmarking work has been more extensive than it has ever carried out before. It includes internal and external benchmarking, international (including outside Europe) benchmarking, and, in some cases, benchmarking against other industries. The company has devoted a large resource to the programme and it has produced useful results. We consider that the benchmarking carried out represents a good start, and the efficiency opportunities identified are useful benchmarks. In some cases the data produced are less comprehensive than would be ideal. Network Rail has had difficulty in finding a suitable number of comparators that are willing to fully engage and provide quantified

data within the timeframes of its PR13 programme. It has focused on understanding 'better practice' rather than understanding the quantum of efficiency that could be realised in CP5.

8.308 Network Rail has recognised that international benchmarking requires a long-term engagement plan and that it should become a 'business-as-usual' activity. We support the continued development of this work. As the benchmarking programme continues into CP5 we expect it to identify further better practices and efficiency opportunities that can be realised during the control period and beyond.

8.309 The reporter's review highlights that a significant increase in pre-efficient baseline expenditure can lead to efficiency savings being cancelled out over the long-term. We recognise this and have challenged Network Rail's pre-efficient costs rigorously. Where the company has not provided sufficient evidence to support its pre-efficient expenditure forecasts we have made adjustments.

Maintenance and renewal efficiency – overall view

Our bottom-up efficiency analysis

8.310 Our overall view of the efficiency available in CP5 is informed by the expert views given in the full range of studies described. We have carried out a comprehensive review of all efficiency evidence highlighted by these studies and taken a view on the likely efficiency opportunity which will remain at the end of CP4. In doing this we have considered the extent to which Network Rail has already addressed the issue identified, or has plans in place to address it by the end of CP4.

8.311 In evaluating the efficiencies available to Network Rail in CP5 we have considered the full efficiency over and above that achieved in CP4. This includes the efficiencies which we believe will be gained through the implementation of the proposed CP5 policies, referred to as "embedded efficiencies" since they are embedded in the CP5 policies. In its SBP Network Rail set out its pre-efficient plans on the basis of CP4 exit unit costs and application of CP5 policies.

8.312 The full body of evidence that we have catalogued has been mapped to associated costs in Network Rail's SBP. This results in our view of efficiency by route for maintenance and renewal. In developing our quantified view of efficiencies from the underlying evidence we have used the judgement of the ORR's expert asset engineers and safety professionals. This judgement is informed by Network Rail's plans, the views of the independent reporters, and the views of numerous industry

experts as expressed in the studies reviewed. Our judgement is intended to be taken "in-the-round".

8.313 All efficiencies identified have been reviewed to identify possible safety implications. We do not consider that any of the efficiencies identified need result in any detrimental impact on safety; many of them have the potential to deliver a substantially safer railway.

8.314 Many source documents suggest a range of plausible efficiencies from the initiatives identified. We have taken a conservative view, recognising that there may be overlaps in evidence and efficiencies. We have given consideration to the deliverability of identified efficiencies within CP5.

Our efficiency overlays

8.315 The efficiency overlays that we have applied are the result of weighting our bottom-up developed efficiencies and Network Rail's efficiencies. The weighting we have applied is based on our view of the robustness of Network Rail's benchmarking and efficiency work, and for renewals it varies by asset category. This is informed by the independent reporter's review of the company's benchmarking and efficiency evidence.

Table 8.25: Our assessment of Network Rail's benchmarking and efficiency and our applied weightings

Asset	Assessment of Network Rail's benchmarking and efficiency	Weighting applied to Network Rail's efficiency analysis	Weighting applied to ORR's efficiency analysis
Renewals			
Track	Fair	50%	50%
Signalling	Good	75%	25%
Civils	Some significant limitations	25%	75%
Buildings	Fair	50%	50%
E&P	Good	75%	25%
Telecoms	Some significant limitations	25%	75%

8.316 For maintenance the reporter's review of benchmarking and efficiency found a range of issues and we have reflected this in developing our view. Further details of efficiency are given by asset category later in the chapter.

8.317 Finally, we have reviewed cross-cutting areas of potential efficiency which have not been covered by our bottom-up analysis or in the efficiency evidence which Network Rail has set out. These include inflation management and occupational health management as discussed in chapter 4. Our review of these concludes that a further 1.12% efficiency can be gained by the final year of CP5.

8.318 We conclude that maintenance efficiencies of 16.5% and that renewals efficiencies of 20.1% are available by the final year of CP5.

International top-down benchmarking

8.319 We have carried out international top-down benchmarking as described in detail at the end of the chapter. The results of the top-down benchmarking, whilst not fully directly comparable, give us higher confidence that the efficiency overlays which we have developed using bottom-up techniques, and which we have applied to develop our view of efficient costs, apply an appropriate level of challenge.

Maintenance and renewals assessment

8.320 We set out our assessment of maintenance and renewals below. Because Network Rail took different approaches in producing its maintenance and renewals plans we have set out our assessment separately.

Maintenance assessment

Pre-efficient

8.321 Network Rail's maintenance policy and strategy is discussed in various parts of the SBP submission, including in the asset policies, the "Infrastructure maintenance strategy" document, the "Optimising maintenance regimes" document and in its maintenance efficiency business cases. The documents set out, at a high level, Network Rail's proposed approach to maintaining its assets.

8.322 Network Rail has carried out central modelling of maintenance activities required based on its asset portfolio and interpretation of the high level requirements set out in the asset policies. Maintenance expenditure has then been calculated for direct activities (i.e. maintenance work carried out on infrastructure assets) by multiplying

volumes of activity by maintenance unit costs. Indirect costs (such as route based maintenance management teams) have been modelled separately. Network Rail provided the outputs of its central modelling to the routes.

8.323 Routes separately produced maintenance expenditure plans on the basis of their projected headcount requirements. These plans were variable in the extent to which they took account of route specific factors. There was evidence of routes taking account of major infrastructure changes such as enhancement related new electrification assets, but little evidence of changes in response to new asset policies, except in their assumed efficiency overlays.

8.324 Network Rail did not submit maintenance volumes with its SBP. Subsequently we asked for a breakdown of maintenance volumes to be provided and these have been submitted for CP5 for some maintenance work types relating to track, signalling, and electrification and power.

8.325 We consider that the links between Network Rail's proposed approach to maintenance, its submitted volumes and its planned maintenance expenditure are weak. Network Rail's submitted plans are resource based. The templates used in the financial modelling system to collate the routes' costs did not support a volumes based approach. As a result Network Rail has been unable to provide assurance that its maintenance costs represent the costs of the actual volume of maintenance work required in CP5.

8.326 These limitations in Network Rail's maintenance planning lead to uncertainty in the maintenance plans put forward. However, we have not identified an overall bias in the approach taken in building the pre-efficient plans and have therefore not made adjustments for this uncertainty (with the exception of an adjustment for reactive maintenance costs).

Maintenance efficiency

8.327 Network Rail has developed a set of maintenance efficiency documents which describe the efficiency initiatives identified, as informed by its programme of benchmarking. Examples of the key areas identified are: risk-based maintenance, improved working practices, savings in the indirect maintenance costs, better asset information (and therefore improved targeting of work and improved response to infrastructure faults), more mechanisation, further roll-out of intelligent infrastructure,

multi-skilling, standardisation, improved contracting strategy and further recycling of materials. Network Rail's identified central efficiencies were estimated to deliver £194m of efficiency savings in CP5.

8.328 Some local efficiencies have been developed by the routes which are estimated to deliver £140m of efficiency savings in CP5. These largely relate to improved planning processes and to consolidation of route delivery units to generate efficiencies in indirect costs.

8.329 In addition to central and route initiatives Network Rail has assumed that further, as yet unidentified, route initiatives will generate £140m further savings in CP5.

8.330 The independent reporter, Arup, has audited the benchmarking and efficiency analysis carried out for maintenance activities. In summary, it considers that the approach taken to external benchmarking and the evidence presented has some limitations, and that the approach to internal benchmarking and evidence presented is very poor. Arup found that central efficiency initiatives were not disaggregated by route and there was limited evidence of routes challenging central efficiency proposals. Due to the issues identified by Arup we have used our view of available maintenance efficiencies in developing our assessed efficient expenditure.

8.331 We have conducted our own analysis of the maintenance efficiencies that might be available during CP5. The key difference between our assessed maintenance efficiency and Network Rail's submission is that we assume a different profile, with lower efficiencies to be delivered in the earlier years of CP5 and higher efficiencies to be delivered in the later years. This assumption reflects our concerns over the delivery of efficiencies in CP4 when Network Rail reduced staffing levels before fully embedding more efficient ways of working. Our findings are given by asset below.

Track

8.332 We consider that the most significant track maintenance efficiencies are available from improved asset management systems, further automation of inspection, improved possession management, alliances and improved ballast distribution systems. Our assessed total efficiency in CP5 is comparable to Network Rail's but we have assumed a different profile, resulting in higher efficiency in the final year of CP5.

Table 8.26: ORR assessed costs, track maintenance, Great Britain

£m (2012-13 prices)	CP4	CP5					CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Pre-efficient expenditure	-	434	439	439	438	435	2185
Efficiency	-	3.6%	3.6%	3.6%	3.7%	3.7%	17.0%
Post-efficient expenditure	420	418	408	393	377	361	1958

Signalling

8.333 We consider that the key areas of efficiency for signalling maintenance are remote condition monitoring, recycling of materials, risk based maintenance, procurement policy and improved asset management systems. Our assessed total efficiency for CP5 is comparable to Network Rail's but, as with track, we have assumed a different profile.

Table 8.27: ORR assessed costs, signalling maintenance, Great Britain

£m (2012-13 prices)	CP4	CP5					CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Pre-efficient expenditure	-	158	158	158	159	160	793
Efficiency	-	2.8%	2.8%	2.9%	3.0%	3.1%	13.7%
Post-efficient expenditure	158	153	149	145	141	138	728

Civils and buildings

8.334 A significant proportion of submitted costs for civils and buildings maintenance work appears to arise from Network Rail's own review and administrative activities, including possessions management. Our assessment of civils maintenance efficiency assumes a small amount of efficiency from these activities and from improved supply chain management.

Table 8.28: ORR assessed costs, civils and buildings maintenance, Great Britain

£m (2012-13 prices)	CP4	CP5					CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Pre-efficient expenditure	-	82	82	82	81	82	408
Efficiency	-	0.6%	0.6%	0.6%	0.7%	0.7%	3.1%
Post-efficient expenditure	35	81	81	80	79	79	400

Electrification and power

8.335 We have identified significant electrical power and fixed plant maintenance efficiencies from improved processes for inspection of overhead lines, improved procurement policy and improved asset management systems. We have assumed a profile delivering higher efficiencies in the final year of CP5 than that assumed by Network Rail.

Table 8.29: ORR assessed costs, electrical power and fixed plant maintenance, Great Britain

£m (2012-13 prices)	CP4	CP5					CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Pre-efficient expenditure	-	94	101	104	105	108	512
Efficiency	-	4.4%	4.5%	4.6%	4.7%	4.8%	20.9%
Post-efficient expenditure	73	90	92	90	87	86	445

Telecoms

8.336 The key areas of efficiency identified by our analysis are improved procurement policy, and improved asset management systems, with greater efficiency than forecast by Network Rail being delivered by the final year of CP5.

Table 8.30: ORR assessed costs, telecoms maintenance, Great Britain

£m (2012-13 prices)	CP4	CP5					CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Pre-efficient expenditure	-	22	22	21	21	21	107
Efficiency	-	4.4%	3.6%	3.7%	3.8%	4.0%	18.1%
Post-efficient expenditure	21	21	20	19	18	18	95

Other maintenance costs

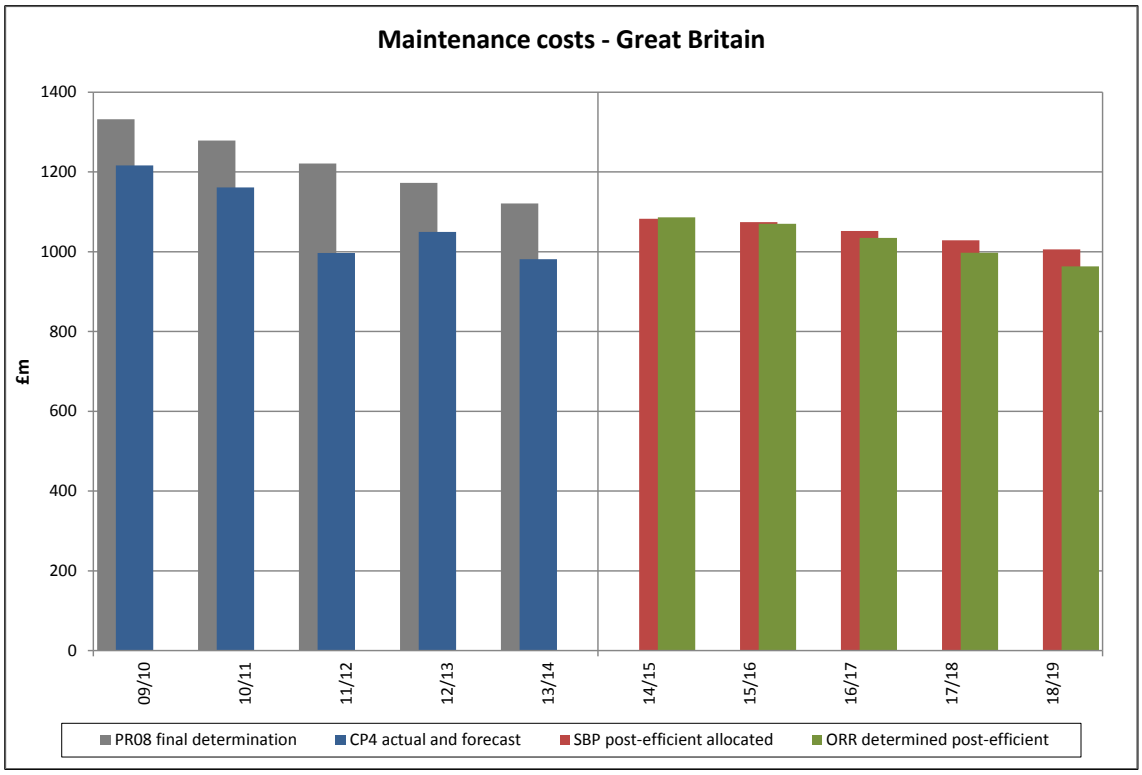
8.337 For other maintenance costs we have found a higher efficiency potential compared to Network Rail's assumptions. These are primarily based on improved procurement policy, improved asset management systems which will enable better planning, and other maintenance overhead efficiencies.

Maintenance findings overview

8.338 Our assessed efficient maintenance expenditure is illustrated below. We have reduced Network Rail's proposed expenditure by £92m.[138]

[138] The increase in expenditure from CP4 to CP5 is due to an accounting change which reclassifies some small scale works, referred to as 'reactive maintenance', as maintenance instead of renewal.

Figure 8.9: Our assessment of efficient expenditure for maintenance



Renewals assessment

8.339 We set out our renewals assessment by asset below, including review of underlying asset data, unit costs, policy and modelling, efficiency and summary of our findings.

Track assessment

Asset data

8.340 Track asset data quality is reasonable but requires some improvement: plain line data and S&C data are graded B3. Network Rail has a good understanding of track service lives.

Unit costs

8.341 Track unit costs are of good quality. Network Rail's plans are substantially based on the application of unit costs which are well understood and developed using appropriate methodologies. The development of the unit costs includes uplift for risk and contingency. The application of these overlays at a disaggregated level introduces high potential for overestimation. For this reason we have applied a 2% adjustment to pre-efficient costs.

Policy and modelling

8.342 The CP5 track policy is one of the more mature asset policies. We consider the assessment of asset criticality based on 5 bandings relating to average delay costs to be an improvement on the similar four quadrant methodology currently in use. It results in a more targeted and risk-based policy for maintenance and renewals. The policy differentiates interventions based on criticality, for example, requiring more refurbishment to be carried out on lower criticality routes. The move towards a more targeted renewal approach is well supported by the whole life cost modelling that has been carried out.

8.343 Network Rail has made good progress in demonstrating that the track policy is both robust and sustainable. It has forecast measures of condition (used life) and asset performance (track geometry and serious rail defects) to CP11 which indicate that the policy is not allowing the asset base to deteriorate in the long-term. Performance is forecast to increase to the end of CP6 and then to be maintained until the end of CP11.

8.344 The plain line track whole life cost modelling is considered good. It is based on the best understanding of asset degradation of all the asset categories, and on robust failure modes, effects and criticality analysis. S&C degradation has not been fully validated and currently relies on engineering judgement. Network Rail is currently carrying out work to improve the modelling by understanding better the deterioration of S&C.

8.345 We consider that the track asset policy has, in the round, met our criteria for robustness and sustainability. Network Rail has demonstrated some significant minimum whole life cost optimisation but there are opportunities for further optimisation. For example, there is uncertainty over the assumed service life increase for refurbished S&C.

8.346 Renewal of track plain line and S&C has been modelled by applying service life assumptions to the current and forecast asset base. The engineering rules applied in the model were found to be consistent with the track policy. Model inputs were found to be accurate with the exception of a minor inconsistency in traffic data and a variation in refurbishment costs of up to 7%. No computational errors were identified and outputs were accurately included in the SBP data tables and showed reasonable alignment with route based plans.

8.347 Network Rail has included expenditure within its plans associated with the acceleration of track renewals from future control periods. This is expenditure which will, in the long-term, deliver work more efficiently. Accelerated track renewals are proposed where future access will be more constrained (for example due to the completion of Crossrail) or where enhancements are leading to increased tonnage. We have reviewed Network Rail's proposals for accelerated track renewals and consider that they are well evidenced. The proposed volume of maintenance and renewal work is in line with our expectations when considering the accelerated renewals.

Efficiency

8.348 We consider Network Rail's external benchmarking for track to be relatively good. It has conducted a programme of site visits to external comparators to observe working practices and identify better practices which might be adopted on its network. Its track benchmarking has included visits to Sweden, Switzerland, Italy, France and Spain. Information gathered is both qualitative, for example noted differences in work activities, and quantitative, including a high level comparison of unit costs between Network Rail and four European peers. In addition to its benchmarking work, the company has presented its models for future delivery of plain line and S&C renewals. These models are well developed with clear alignment between the benchmarking work and efficiency measures within the models. Efficiency measures include reducing the size of gangs, increased multi-skilling of staff, greater use of mid-week possessions and a new contracting strategy. There is moderately good alignment between the proposed efficiencies presented in the track efficiency business cases and the efficiencies which appear in the SBP.

8.349 Our review of efficiency finds similar best practice opportunities to those identified by Network Rail but quantifies them to find greater overall cost efficiencies. Key areas of potential efficiency are further automation of track inspection, improved asset management systems, improved supply chain management and improved management of possessions. We have applied 50% weighting to our analysis and 50% to Network Rail's which reflects our view of the robustness and completeness of the track benchmarking and efficiency work conducted by Network Rail.

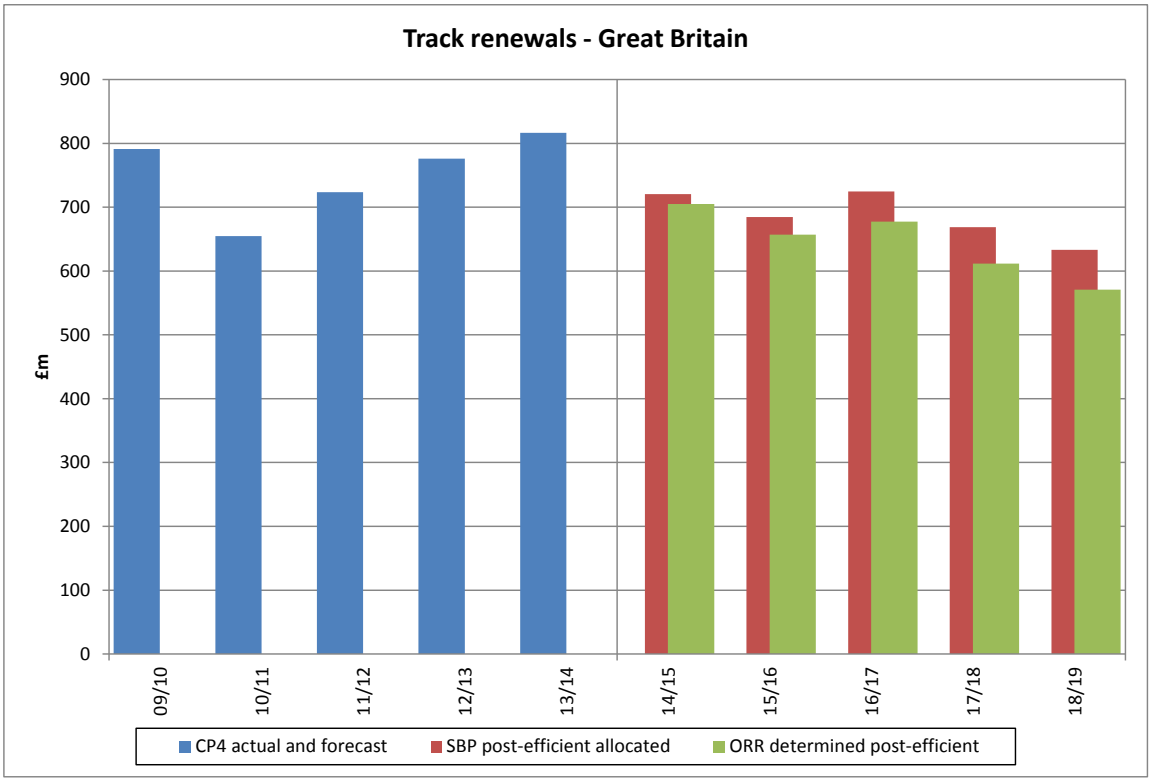
Findings

8.350 Our assessment of the level of track (including off-track) expenditure required during CP5 is shown in Table 8.31and illustrated in Figure 8.10 below.

Table 8.31: ORR assessed costs, track renewals, Great Britain

£m (2012-13 prices)	CP4	CP5					CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Pre-efficient expenditure	-	756	745	808	770	756	-	3836
Efficiency	-	6.8%	5.4%	5.0%	5.2%	4.9%	-	24.5%
Post-efficient expenditure	816	705	657	677	612	571	3762	3221

Figure 8.10: Our assessment of efficient expenditure for track renewals



8.351 In total we have reduced Network Rail's planned renewals expenditure on track and off-track by £210m.

Off-track assessment

8.352 We welcome the development of an asset policy for off-track assets and the recognition of the importance of off-track assets in contributing to the efficient delivery of network safety and performance.

Asset data

8.353 Network Rail has recently taken steps to increase significantly its knowledge of its off-track assets. Its information relating to boundaries has been improved by routine data collection during boundary inspections. Vegetation knowledge has been improved through the National Lineside Tree Survey, completed in March 2011. Improved asset knowledge has enabled better planning of the volume of maintenance and renewal works required.

Policy and modelling

8.354 The off-track policy is relatively immature since it is new and untested. It promotes the move from a reactive approach to a more proactive management of boundaries and vegetation as the most cost effective way of managing the assets. The policy results in a planned large increase in expenditure relative to CP4. This expenditure is forecast to improve asset condition to a level which will be sustained from the end of CP5 for England & Wales and from the end of CP6 for Scotland.

8.355 Network Rail has more work to do to demonstrate the efficiency of the policy and to understand the optimum interventions and strategy. It has not yet developed a model for optimising long-term asset management costs. We welcome the move towards a more proactive approach to the management of off-track assets and the safety and performance benefits that this will bring. We believe more can be done to investigate the most appropriate and cost effective ways of managing boundaries and consider that the proposed volumes of work require more substantiation.

8.356 We consider that the proposed policy is likely to be robust and sustainable but the effect of the new policy will have to be monitored closely. The policy is not demonstrated to be minimum whole life cost.

8.357 Network Rail's plans do not specify the volumes of vegetation clearance that will be delivered. The policy states that all fences in 'very poor' condition are to be renewed and all 'poor' condition fences are to be repaired. The plans do not include present

and forecast condition measures to show the scale of improvement which will be delivered.

8.358 Modelling is not as refined as for the track asset but it uses reasonably accurate actual data from fencing and vegetation surveys. The off-track model for fencing was found to have inconsistencies with the asset policy which leads to uncertainty over its outputs. Unit rates used were found to be rudimentary but consistent with the off-track policy. No computational errors were identified.

8.359 Our view, supported by the independent reporter, is that the overall costs which are included in the plan are above the levels which are necessary to deliver the policy requirements. For these reasons we have reduced Network Rail's pre-efficient plans for management of boundaries by 25%.

Efficiency

8.360 Our analysis of off-track efficiency has found significant opportunities from increased mechanisation of vegetation clearance, improved asset management and information systems and improved supply chain management. We have applied 50% weighting to our analysis and 50% to Network Rail's which reflects our view of the robustness and completeness of the off-track benchmarking and efficiency work conducted by Network Rail. In total our assessed expenditure for off-track renewals gives Network Rail £88m more than is forecast to be spent in CP4.

Signalling assessment

Asset data

8.361 Network Rail uses a Signalling Infrastructure Condition Assessment (SICA) tool to prioritise signalling maintenance and renewal works. SICA and its use were audited by the asset management independent reporter in 2011. The reporter found SICA to be fit for the purpose which it was designed for: to prioritise logically the short- to mid-term renewals workbank. Useful remaining lives generated by SICA are underestimated and are not accurate for use in strategic planning. SICA is not a suitable tool for ensuring that signalling assets are managed sustainably to achieve minimum whole life cost. The independent reporter, Arup, graded signalling asset data quality A3, reflecting good practice data governance, but some deficiencies in terms of data accuracy and completeness.

Unit costs

8.362 The independent reporter's audit of signalling unit costs has found some limitations in the approach adopted including the adjustment of new framework rates to reflect historical levels of cost performance. As with all asset types Network Rail has not provided sufficient evidence to demonstrate strategic oversight in the estimation of risk allowances. It has estimated risk at a unit cost level rather than a programme level which has high potential to overestimate risk allowances. The reporter has also found that uplifts have been made to unit costs based on the risk and management costs seen in CP4. The new signalling contracts have transferred some risk to the supply chain and it is not clear that this has been reflected in the CP5 unit costs. For these reasons we have applied a 3% reduction to Network Rail's pre-efficient costs.

Policy and modelling

8.363 The CP5 policy for signalling sets out a well justified approach to managing the maintenance and renewal of signalling assets, taking account of the major programme of works required for both NOS and the staged further introduction of ERTMS. Due to the national and long-term nature of these programmes the forecasts of signalling maintenance and renewal works are more dependent on centrally developed long-term workbanks than is the case for other assets. The asset policy includes appropriate statements on the prioritisation, advancement and deferral of work to ensure that programmes are aligned.

8.364 The policy requires the use of partial and targeted renewals instead of full renewal where possible and this is considered an appropriate, efficient approach where no changes are needed in preparation for ERTMS.

8.365 The policy of moving from conventional signalling to ERTMS is considered sound. The business case for the national application of ERTMS was established and reviewed approximately four years ago. This demonstrated that there was a long-term whole life, whole industry benefit to implementing ERTMS, through the reduction of lineside assets, safety benefits and capacity improvements. The plans for CP5 show significant costs, including development costs, to support that long-term benefit.

8.366 The policy to move to more centralised signalling control has been assessed through review of the business case as discussed in chapter 7 and is considered to be appropriate. This programme of work results in a large volume of signalling renewal in CP5 but this is justified by the future benefits in operational costs.

8.367 The volume of signalling renewals in CP5 has been assessed. The management of signalling renewals is a well-managed process resulting in volumes of renewal which have a high degree of credibility. The signalling asset policy is considered robust to deliver outputs in CP5.

8.368 We have reviewed the sustainability of the signalling asset policy by challenging the modelling of long-term outputs in its signalling strategic planning model. The renewal of signalling asset would normally be managed to maintain a steady level of asset condition measured nationally. In CP5 the plan to accelerate some renewals for the benefit of NOS should result in a small improvement in overall asset condition. We consider that the CP5 signalling asset policy is likely to deliver an asset base of stable condition in the long-term, while delivering the major programmes of work needed by the industry.

8.369 The whole life cost modelling that supports the signalling asset policy has considered an appropriate mix of asset interventions. We have some concern that the degradation modelling may be conservative. The use of SICA in the strategic planning model may result in a slight bias towards over-forecasting in the long-term. However, the development of long-term workbanks, and the alignment of key national programmes of work is excellent and gives confidence that the plan is optimised on a whole life cost basis.

8.370 The signalling model takes the bottom-up developed signalling workbanks as an input. The model was found to be consistent with policy. Some inconsistencies in unit costs for specific signalling work types were identified. No specific, consistent and material issues were found with computational accuracy in modelling costs and volumes for CP5.

Efficiency

8.371 In its SBP Network Rail claimed that there were £380m of embedded efficiencies being delivered by its CP5 signalling policy. The actual efficiencies being generated by a change of asset policy are difficult to determine (since a change in policy is likely to lead to changes in expenditure in all future control periods). However, our review finds that the level of embedded efficiencies for signalling is likely to be overstated due to flaws in the calculation methodology. We have assumed that signalling embedded efficiencies are £190m.

8.372 Our assessment of additional efficiency has found some significant opportunities remain from further adoption of modular signalling, plug-and-play technology, improved asset management systems and from adopting best practice supply chain management. The analysis results in a higher level of efficiency than proposed by Network Rail.

8.373 The independent reporter's audit of Network Rail's benchmarking and efficiency for signalling renewals has found the approach adopted to be reasonably good. In particular it has found the internal and external benchmarking that has been carried out to be sound. Network Rail has engaged with its suppliers in developing signalling framework contracts which reflect commitment to delivering the efficiencies. Given the relative certainty in signalling efficiencies from the supply chain we have applied 75% weighting to Network Rail's efficiency plans and 25% to our analysis.

Routes

8.374 Signalling plans are based on long-term workbanks which have been developed centrally to ensure that they are aligned with the ETCS and NOS programmes. Routes are bought in to the central plans and these are reflected in route plans.

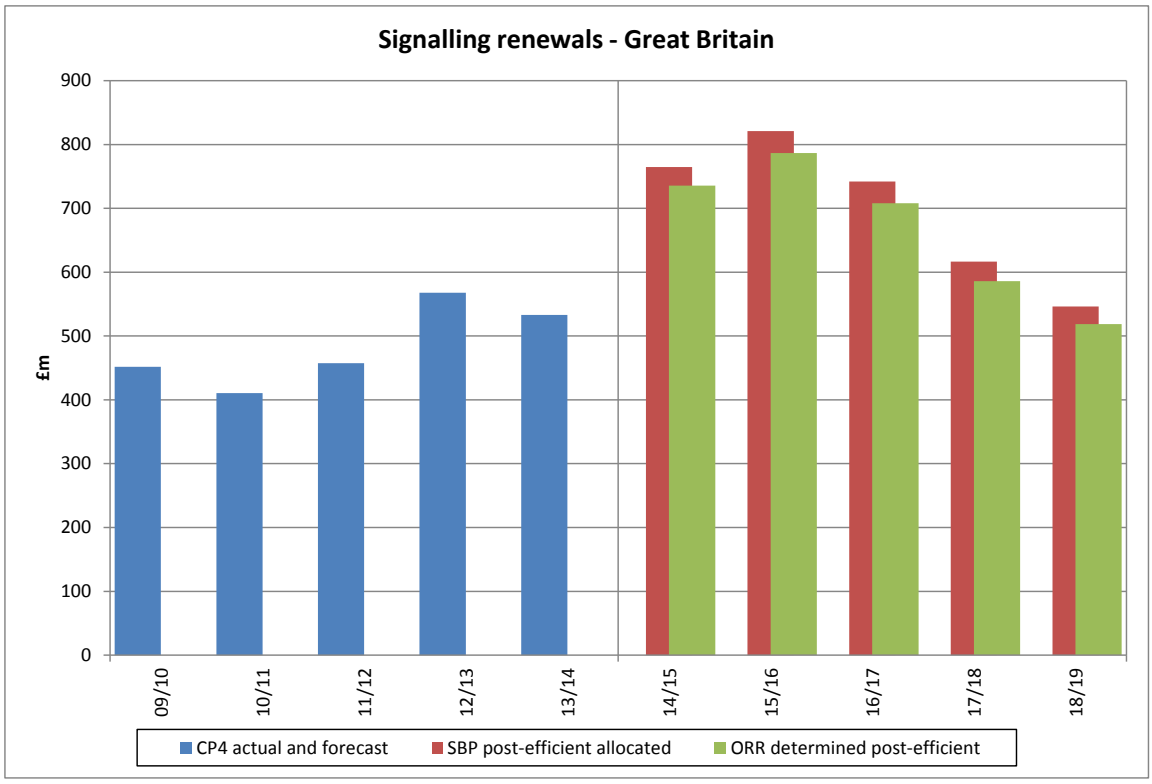
Findings

8.375 Our assessed efficient expenditure for signalling renewals is illustrated below.

Table 8.32: ORR assessed costs, signalling renewals, Great Britain

£m (2012-13 prices)	CP4			CP5			CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Pre-efficient expenditure	-	808	903	856	742	682	-	3990
Efficiency	-	9.0%	4.3%	5.1%	4.5%	3.7%	-	24.0%
Post-efficient expenditure	533	736	787	708	586	519	2421	3335

Figure 8.11: Our assessment of efficient expenditure for signalling renewals



8.376 Our assessment of Network Rail's plans supports the large increase in expenditure from CP4 to CP5, which is driven by the asset policy and its consideration of well justified national programmes of work: NOS and ERTMS.

8.377 In total we have reduced Network Rail's planned renewals expenditure on signalling by £155m, but our assessed expenditure is £914m greater than planned expenditure in CP4.

Treatment of ERTMS train fitment costs

8.378 In its SBP, Network Rail treated costs associated with fitting ERTMS equipment on trains as renewal expenditure. Our draft determination uses the same categorisation (i.e. these costs are included in Table 8.32 and Figure 8.11). However, because the costs of ERTMS train fitment are new they are uncertain and levels of risk are high. For final determination we therefore propose to treat ERTMS train fitment costs as an enhancement ring-fenced fund as discussed in chapter 9.

Level crossings assessment

Asset data

8.379 The independent reporter graded level crossings asset data quality A2, reflecting good practice data governance, but with some shortcomings in the accuracy or completeness of data.

Unit costs

8.380 Unit costs for level crossings are produced in a similar manner to conventional signalling equipment. However, our review suggests that they include high levels of additional overlays which have not been fully justified and that they are high compared to other control periods. We have therefore applied a 7.5% reduction to level crossings pre-efficient costs.

Policy and modelling

8.381 For CP5 the volume of level crossing activity is a combination of standalone crossing renewals, crossing renewals associated with signalling renewals and safety improvement upgrades.

8.382 Level crossing renewals and maintenance are managed through the track and signalling asset policies. Network Rail plans to introduce greater coordination of level crossing activities. Key to this is the introduction of level crossing managers who will oversee activities at their designated crossings.

8.383 A criticism in the past has been that signalling renewals have ignored level crossings in the area affected, hence missing opportunities to modernise or upgrade crossings efficiently as part of a larger scheme. Network Rail now indicates a clear intent to improve on this issue in CP5.

8.384 Discussions with Network Rail also indicate a greater understanding of the need to assess risk at level crossings before determining what action is appropriate. We welcome this and it should result in well-chosen solutions for level crossing renewal and/or upgrade.

8.385 Many manual level crossings will receive attention in CP5 as they will need to be modified to obstacle detection operation. This is likely to result in a small improvement in overall asset condition.

Efficiency

8.386 Technology developments that offer the potential for efficiencies and safety improvements are dependent on a small group of engineers for their success. Some of these projects seem to be very slow in development which may be a result of an imbalance of demand and resources.

Civils assessment

Asset data

8.387 Civils structures asset data are of poor quality. Whilst Network Rail now has reasonable data governance processes in place there is very significant inaccuracy in the records held. This leads to high uncertainty in the planned works for CP5. The independent reporter graded civils asset data quality B5.

8.388 Asset data relating to earthworks are kept in an online earthworks condition database. Network Rail has recently improved its asset knowledge and is undertaking a number of improvements and corrections to this database. The majority of earthworks assets have had at least one examination. Condition data for earthworks are captured using 'hazard' indices which categorise assets as serviceable, marginal, poor or top poor. Coverage of the asset base is good and data are considered to have low uncertainty.

Unit costs

8.389 Civils unit costs are based on a statistical analysis of historical project cost data, drawn from the Cost Analysis Framework (CAF).

8.390 Unit costs are used to develop just over half of the CP5 planned expenditure for overbridges and underbridges, 87% of earthworks expenditure and less than half of the remaining expenditure. The proportion of civils planned expenditure based on non-unitised costs is relatively high and these have a greater level of uncertainty.

8.391 The independent reporter has audited Network Rail's development of its civils unit costs and found a range of issues which introduce uncertainty or bias:

(a) there is significant uncertainty in the method of cost estimation for overbridges and underbridges and the level of preliminary costs within these items is disproportionately high for civil engineering works of this nature;

(b) there is an error in the application of further overlays for preliminary works and management costs which is likely to lead to an overestimation of costs of approximately 10 to 20%;

(c) there is potential for the overestimation of risk and contingency in the unit costs due to overlays being applied at a disaggregated level;

(d) there is inconsistency in the inflation indices used to uplift historical costs for different civils asset categories;

(e) further evidence is required that the historical mix of work is representative of the mix of work in CP5 as this affects unit costs; and

(f) there is very high uncertainty in relation to minor works cost projections.

8.392 For these reasons we have reduced Network Rail's pre-efficient cost forecasts. We have applied a 5% reduction in the first two years on the basis that a greater proportion of expenditure is supported by project estimates, and a 10% reduction for the remaining years where forecasts are more reliant on unit costs.

Policy and modelling

8.393 Network Rail has completely rewritten its civil structures and earthworks asset policies in response to the recommendations resulting from the reporter's review of civils asset management (as discussed previously). We, and the independent reporter Arup, have assessed the new policies and found them to be a very significant improvement on those currently being implemented and past practice. Previous policies were ambiguous, did not set clear intervention triggers and requirements, and were open to significant interpretation, leaving considerable uncertainty over the required level of work to maintain a safe and sustainable asset base.

8.394 The structures policy sets out the triggers for intervention and clear rules for the nature of the work required. The policy has been supported by simpler and clearer 'policy on a page' documents. Network Rail has produced a whole life cost model for some of the structures assets. The model is a sophisticated tool which has been used to inform the optimisation of interventions. The model has been audited and found to be computationally sound. However, the whole life cost modelling is limited by the quality of its unit cost and asset degradation inputs, leading to outputs which are considered to have moderately high uncertainty.

8.395 The earthworks policy aims to reduce the earthworks related delay minutes (largely driven by embankments) and to reduce the number of asset failures (mainly driven by cuttings). It has been developed using a decision support tool called SCAnNeR. The model has been used to assess intervention options which range from maintenance to

full renewal. We have reviewed the model and its application and consider it to be sound. However, the company has further work to do in developing its understanding of degradation and risk prioritisation which may result in further optimisation of the policy. The policy proposes a logical approach to asset interventions on the basis of route criticality and asset condition, for example recognising that cuttings generally represent a higher safety risk than embankments. However the policy focuses primarily on maintaining and refurbishing earthworks assets rather than carrying out full renewal and this raises issues as discussed in chapter 11. Network Rail has recognized the importance of drainage and its contribution to addressing the root cause of earthworks failures. The prioritisation of drainage work for CP5 is considered appropriate to manage the asset.

8.396 Network Rail is currently analysing the large number (approximately 180) of earthworks failures which occurred in 2012-13 to see if amendments are required to its earthworks standards or policies. This may have an implication for the CP5 workbank.

8.397 As with other asset categories Network Rail has carried out both central modelling and route based development of civils workbanks to forecast the effect of implementing the new policies. The central model for civils structures is called CECOST. It uses similar principles to the CECASE model submitted in support of the company's PR08 SBP. The CECOST modelling and outputs were being developed in short timescales in the run-up to the submission of the SBP. The model was not available for detailed scrutiny as part of our progressive assurance work prior to the SBP submission. Presentation of the model and its outputs has been insufficient to provide assurance that it is producing a robust forecast of work required by the asset policy. Earthworks modelling has been carried out using SCAnNeR. The model has been reviewed based on an engineering assessment of its inputs and outputs and no material issues were found.

8.398 Effectiveness of the new structures and earthworks policies is critically dependent on how well new practice is embedded in the devolved routes and this will be the subject of further review in 2013.The embedment process is in its early stages and is expected to continue throughout CP5. The plans for CP5 include the expenditure associated with these programmes during the period.

Efficiency

8.399 Network Rail has forecast civil renewals efficiency of 13.8% during CP5. Our analysis finds potential for greater efficiency of 19% from adopting best practice asset management for these assets. For example, there is potential for efficiency from better packaging of civils renewals works, improved supply chain management and improved data management, availability and analysis. There will also be efficiencies available due to the high volumes of work required over the next two control periods. Our audit of Network Rail's benchmarking and efficiency work has found that there are some significant limitations to the approach adopted and evidence base presented. Whilst the company's external benchmarking was considered relatively good, the audit found significant limitations in plans at operating route level and a lack of internal challenge applied. For the first two years of the control period our efficiency analysis finds very similar levels of efficiency to Network Rail's plans. We have accepted Network Rail's efficiencies for these two years. For the remaining three years, due to the weaknesses identified in Network Rail's approach we have applied 25% weighting to its analysis and 75% to ours.

Routes

8.400 Network Rail's routes have, independently, produced workbanks to align with the structures and earthworks asset policies. The route plans developed have been of varying quality. The most complete workbanks are based on a full survey of civil assets and assessment of the most appropriate work required based on on-site condition. Some routes appear to have built workbanks based on relatively poor information and a less complete understanding of the application of the new policy.

8.401 Network Rail has not fully understood the drivers of differences between its route plans and central modelling. This has resulted in a plan which uses the outputs of central modelling for forecasting of some of its detailed costs and route based plans for others and leads to potential for inconsistencies.

Findings

8.402 Network Rail's derivation of its civils plans is not clear. We have held a series of meetings with the company to gain more clarity. These have led to submission of corrections to the original SBP data, submissions of new data and production of further clarification documents. We have concerns about the process for development of the civils plans and have not been assured that the costs and volumes presented

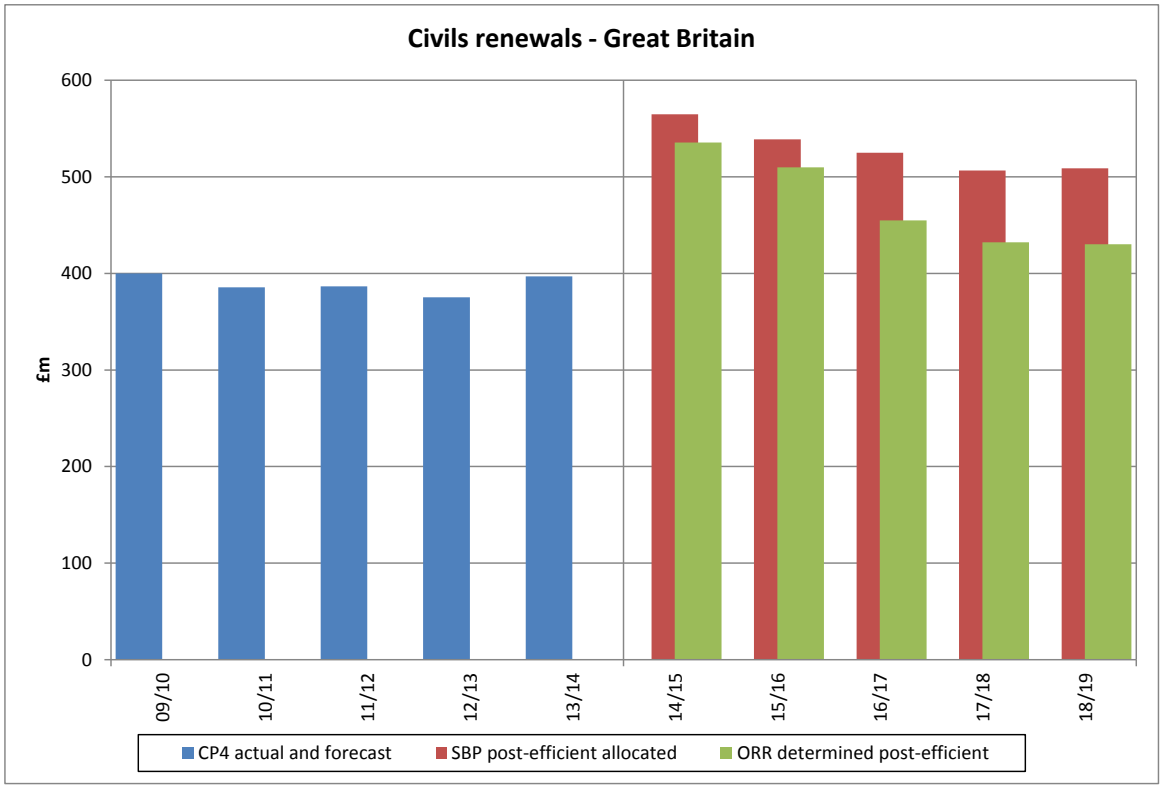
are robust, sustainable and efficient. We consider that the proposed costs and volumes for delivery of structures and earthworks asset policies in CP5 and beyond are highly uncertain. Network Rail has further work to do to fully understand the required levels of activity in CP5, CP6 and beyond.

8.403 Our assessment of the level of civils expenditure required during CP5 is shown in Table 8.33 and illustrated in Figure 8.12 below.

Table 8.33: ORR assessed costs, civil engineering renewals, Great Britain

£m (2012-13 prices)	CP4			CP5			CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Pre-efficient expenditure	-	562	548	517	514	531	-	2672
Efficiency	-	4.8%	2.3%	5.5%	4.5%	3.6%	-	19.0%
Post-efficient expenditure	397	536	510	455	432	430	1944	2362

Figure 8.12: Our assessment of efficient expenditure for civil engineering renewals



8.404 For the first two years of CP5 we have adjusted Network Rail's pre-efficient unit costs, accepted unit cost efficiencies, and accepted proposed volumes because its plans are largely based on workbanks (i.e. volumes of work at specific locations).

8.405 For years 3, 4 and 5 of CP5 Network Rail's plans are increasingly reliant on high level modelled outputs. We have less confidence in its volumes, costs and efficiencies. We have adjusted its pre-efficient unit costs and made adjustments to unit cost efficiencies. We have accepted proposed volumes subject to an adjustment mechanism, described below, to deal with the high uncertainty in the plans. Network Rail is to be funded on this basis and these numbers are built into the access charges.

8.406 In total we have reduced Network Rail's planned renewals expenditure on civil engineering works by £281m but we are funding a considerable increase in civils renewals expenditure (£418m more than is planned for CP4, or £565m more after adjusting for CEFA). Recognising that there is high uncertainty around the exact requirement, we propose that civils expenditure is treated differently in the determination, through a 'civils adjustment mechanism'.

Civils adjustment mechanism

8.407 The civils adjustment mechanism will work as follows. In the first two years of the control period Network Rail is expected to deliver the civils renewal volumes proposed in the SBP. Any under-delivery of volumes will have to be caught up. Volumes should not go above the agreed levels, but if they do the normal RAB roll forward policy will apply. Any underspend or overspend for unit costs reasons will be subject to the RAB roll forward policy. (In simple terms, the RAB roll forward policy allows Network Rail to keep 25% of efficient underspend but requires it to bear 25% of overspend.)

8.408 Network Rail must submit a plan in March 2015 for the work it proposes on renewal of civils assets during years 3, 4 & 5 of CP5. It is important that this plan is of a high quality such that we can form a judgement on the volumes and efficient costs of the work for which Network Rail will be funded[139]. We will issue a notice by 31 March 2014 requiring Network Rail to submit a plan no later than 31 March 2015.

[139] Network Rail's licence provides for us to require the company to send us plans which demonstrate its compliance and proposed compliance with meeting its obligation to maintain and renew the network in line with best practice and in an efficient way. The licence also provides for us to specify the structure, format, standard and level of detail of the plan by way of a notice.

We will expect the plan to demonstrate that Network Rail has in place a bottom-up workbank, created by applying its asset policies to the civils asset portfolio, in accordance with condition 1.19 of its Network Licence. The workbank will be specific as to each asset on which work is proposed, its condition (at that time), the scope and cost of the work proposed, and its condition when the work is complete.

8.409 We are taking this step because of the unusual position we find ourselves in, that whereas Network Rail believes a significant backlog of work has developed in civils, its SBP submission has not fully demonstrated this and has also prevented us from concluding on civils expenditure in the determination.

8.410 We will review the plan and form a judgement on the volumes and efficient costs of the work for which Network Rail will be funded (our 2015 civils determination). The volumes and efficient costs could be under or over those assumed in our final determination but, once determined, these will be used to assess Network Rail's efficient delivery during the period. The difference between our 2015 civils determination for the three years and the costs assumed in the PR13 final determination will be settled by a RAB adjustment at the start of CP6.

8.411 Any underspend or overspend on unit costs against the 2015 civils determination will be subject to the normal RAB roll forward policy. If Network Rail under-delivers on volumes it will have to catch up. Over-delivery of volumes will be subject to RAB roll forward.

Drainage assessment

Asset data

8.412 Network Rail's management of its drainage assets has historically been poor. In our PR08 determination we provided funding to improve the condition of these assets. The company was slow to apply this but is now increasing its focus on management of drainage and this is reflected in its production of a new, separate drainage policy. It has also begun to address its poor knowledge of the asset through the IDP. This has delivered a step-change improvement in the drainage asset register and condition information, but gaps remain. Network Rail has not assessed condition for a significant proportion of the surveyed assets (just over 40%) and has not assessed condition for the majority of the pipes as it cannot be determined from the type of inspection carried out for IDP. Pipework condition information will not be complete for at least a year.

Unit costs

8.413 Our audit of drainage unit costs has found that forecasts are highly dependent on a low number of unit costs. Network Rail has more to do to demonstrate that the drainage unit costs are appropriately representative of work types.

Policy

8.414 We welcome Network Rail's increased focus on management of drainage assets, the production of a separate drainage policy and the steps taken to improve asset knowledge. However, because the policy is new and untested there remains uncertainty as to whether the policy is robust, and high uncertainty as to whether the policy is sustainable in the long-term and whether it is yet optimised for lowest whole life cost.

8.415 Network Rail's costs associated with drainage are included within its earthworks and track forecasts. Effective drainage management should result in savings to required work for both track and earthworks. By including drainage costs with these elements Network Rail is incentivised to deliver it effectively which should result in direct savings to track and earthworks activities. However, because of outstanding data deficiency and high uncertainty in the CP5 targets, combined with lack of route information provided for review, we consider the volumes and costs to be highly uncertain. We expect Network Rail to improve this substantially in its delivery plan.

Efficiency

8.416 The efficiency of Network Rail's drainage plans is addressed through our assessment of track and earthworks efficiency.

Buildings assessment

Asset data

8.417 The independent reporter has audited the quality of asset data relating to franchised stations and managed stations. Some minor issues with data governance were identified but it was, on the whole, found to be in line with good practice. The dataset was found to be complete and accurate. Buildings asset data and its governance have recently improved through implementation of an enhanced asset management system which allows better recording of all works carried out on the assets, improved control of data quality and better access to information. Buildings data quality is graded B1.

8.418 Although data quality is good Network Rail has more to do to understand buildings degradation and intervention curves. The independent reporter has found that degradation assumptions are likely to be pessimistic, resulting in modelled results which overestimate volumes.

Unit costs

8.419 The audit of buildings unit costs has found their coverage to be relatively low and there is scope for this to be increased to improve the accuracy of plans. A significant proportion (approximately 40%) of Network Rail's buildings plans are based on less robust non-unitised costs. The unitised costs developed only cover building structures and fabric and omit unit costs for mechanical and electrical systems. The audit has found that the quality of evidence to support adjustments which uplift national unit costs is low. The unit costs used include contingencies of 5% which may be high as Network Rail has not demonstrated that it manages risk appropriately at a programme level. We have found many instances of unit costs which do not appear credible and/or for which units are inconsistently applied. For these reasons we find very significant uncertainty in both Network Rail's buildings pre-efficient unit costs and non-unitised costs and reflect this in our overall adjustment to buildings plans discussed below.

Policy and modelling

8.420 We and the reporter have separately assessed buildings asset policy for franchised stations, managed stations, lineside buildings, light maintenance depots and maintenance delivery units. The CP5 buildings policy refines the policy being applied in CP4 but has improved coverage of the assets. The effect of application of buildings policy is forecast in terms of percentage of asset remaining life. Network Rail's modelling of policy projects that, on average, this will improve marginally over the control period and in the longer term (to CP11) it will improve significantly, suggesting that the policy is both robust and sustainable. However, no compelling justification has been provided that the policy represents an optimised approach to the management of risk on the network. It is also noted that the level of expenditure in CP4 has delivered a marginal improvement in the station stewardship measure (SSM). For stations the CP5 asset policy is considered to have met the robustness and sustainability criteria, but there is high uncertainty around whether it is minimum whole life cost. For light maintenance depots the policy is considered, in the round, to have

met all three criteria. For lineside buildings and maintenance delivery units the policy is considered to have either some uncertainty or moderately high uncertainty in all three criteria. Overall this has resulted in moderately high uncertainty in the CP5 volumes and costs included within Network Rail's plans.

8.421 The franchised stations model shows some inconsistency with asset policy. Degradation curves used were found to generate higher volumes than the reporter considered necessary. The managed stations model is based on inputs from a workbank, with the exception of lifts and escalators. For modelling of other buildings assets some uncertainty was identified in inventory and unit cost inputs. No significant computational errors were identified in any of the buildings models.

8.422 The SBP proposes pre-efficient expenditure on buildings of £1,394m (before embedded efficiencies). This represents a 9% increase on CP4 buildings expenditure, which was itself a significant increase on levels of expenditure in CP3. All categories of buildings renewals are forecast for increases in the level of pre-efficient expenditure with the exception of managed stations. We find that the buildings pre-efficient costs are overstated for franchised stations, lineside buildings and maintenance delivery units. For managed stations we find that projected costs appear reasonable given their bespoke plans. For light maintenance depots we consider that the proposed increase in expenditure on depot plant is justified.

8.423 For all categories of expenditure other than managed stations and depot plant, the high level of pre-efficient costs appears to be driven by policy which is not demonstrably optimised and by highly uncertain unit costs. The independent reporter, Arup, has identified that the degradation profiles used by Network Rail in its whole life cost modelling and in its modelling of policy to produce volumes are pessimistic and therefore tend to overstate the intervention requirements, volumes and expenditure required in the long-term. We have reduced Network Rail's pre-efficient buildings renewals plans by £235m to reflect our findings.

Efficiency

8.424 Our assessment of bottom-up efficiencies finds similar best practice opportunities to those identified by Network Rail's benchmarking work and finds similar levels of efficiency by the end of CP5. For example, there are efficiency opportunities through the improved specification of works including use of innovative materials and through optimisation of policy. The independent reporter's audit of Network Rail's buildings

efficiencies has found some uncertainty in the buildings benchmarking and efficiency evidence presented. Internal benchmarking is considered weak but external benchmarking considered reasonably good. We have applied 50% weighting to our analysis and 50% to Network Rail's which reflects our view of the robustness and completeness of the buildings benchmarking and efficiency work conducted by Network Rail.

Routes

8.425 There are some anomalies in the route plans between the average level of expenditure forecast per station. The plans for the Anglia route do not demonstrate clearly how the transfer of maintenance and renewal responsibilities to the Greater Anglia franchise has been allowed for. We have not made additional adjustment for this since it is covered by the overarching adjustment applied.

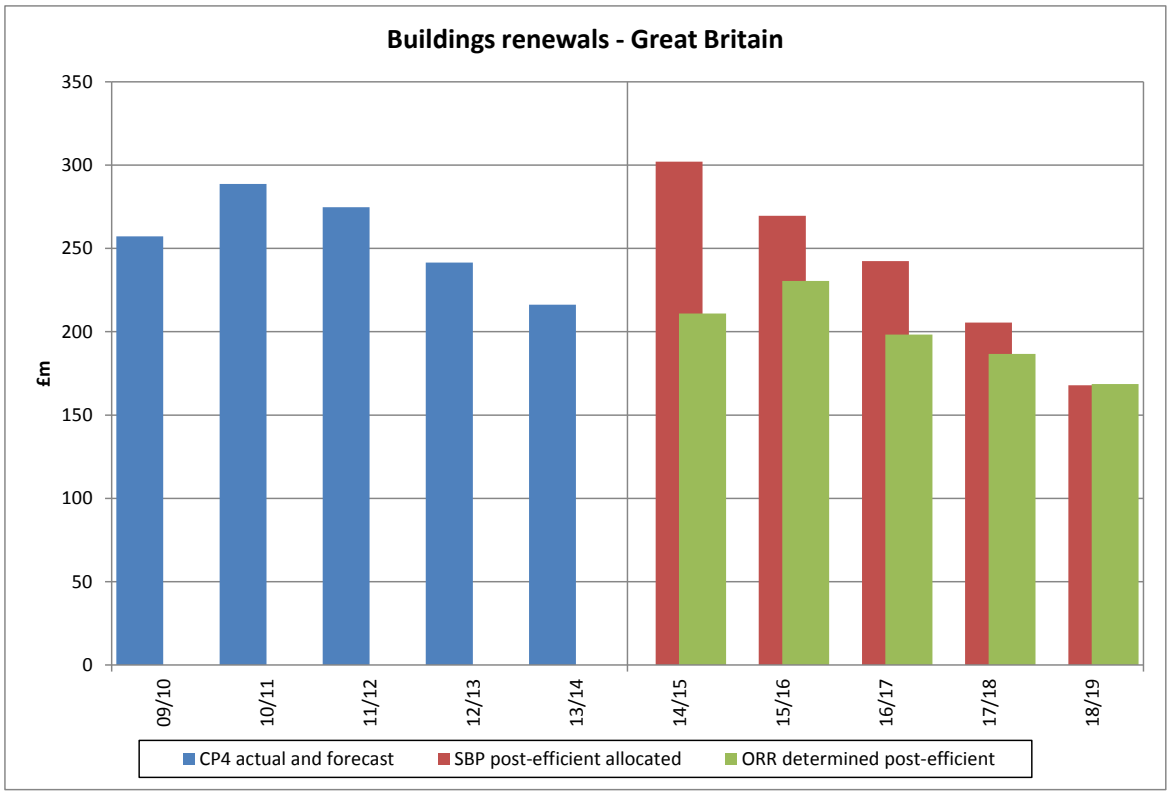
Findings

8.426 Our assessment of the level of buildings expenditure required during CP5 is shown in Table 8.34 and illustrated in Figure 8.13 below.

Table 8.34: ORR assessed costs, buildings renewals, Great Britain

£m (2012-13 prices)	CP4	CP5					CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Pre-efficient expenditure	-	227	259	231	227	215	-	1159
Efficiency	-	7.1%	4.3%	3.5%	4.1%	4.7%	-	21.6%
Post-efficient expenditure	216	211	230	198	187	169	1279	995

Figure 8.13: Our assessment of efficient expenditure for buildings renewals



8.427 In total we have reduced Network Rail's planned renewals expenditure on buildings by £193m.

Electrical power assessment

Asset data

8.428 Network Rail has improved its asset data relating to electrical power assets through the ADIP. It has bettered its understanding of asset degradation and failure modes by collating and analysing historical asset failure data and drawing on the knowledge of asset specialists. The independent reporter's audit of asset data quality has given overhead line data a grading of B2, showing governance to be largely in line with good practice but with some improvements to documentation required and/or evidence required. For conductor rail the audit's findings were similar for governance, but the accuracy of data was found to be poor, resulting in a grading of B4.

Unit costs

8.429 The reporter's audit of unit costs has identified that roughly half of the SBP expenditure submission for electrical power and fixed plant is driven by non-unitised costs. The evidence supporting these costs is low and this leads to greater uncertainty in the plan.

8.430 Where unit costs have been used in building plans these have been developed using an appropriate methodology and are aligned with good practice. The reporter has traced the rates through to the SBP submission. Network Rail has not provided a full justification of the overlays applied to the unit costs and, as with other assets, has not demonstrated a programme level overview of risk estimation. For these reasons we have applied a 2% reduction to the pre-efficient plans for electrical power and fixed plant.

Policy and modelling

8.431 Network Rail has put a lot of work into producing an electrical power asset policy which is a significant improvement on current practice. The new policy addresses safety more comprehensively. For the first time it is based on whole life cost modelling. This work has improved the justification and modelling of policy. However, the policy introduces new ways of working, for example introduction of mid-life refurbishment of overhead lines, which are not yet fully tested and this results in some uncertainty as to whether the policy is robust and sustainable.

8.432 Network Rail has assumed that sustaining electrical power delays (causing disruption greater than 10 minutes) at the level forecast for the end of CP4 will support the delivery of the performance outputs required by the HLOSs. This appears to be a reasonable assumption but Network Rail has not demonstrated a clear link from this measure to its delivery of performance. Through development of the asset policy, Network Rail has made progress with linking work activities in its strategic planning models to the electrical power asset performance indicators to provide assurance that the forecast levels can be achieved. However, discussion with the routes has made it clear that the workbanks are sometimes inconsistent with the central modelling. Our discussions with the routes have also highlighted that they have not consistently provided feedback on the assumptions used in strategic planning models. The disconnects between the strategic planning models (which are linked to asset performance indicators) and the workbanks that underpin the SBP expenditure forecasts, lead to some uncertainty around the robustness of the policy.

8.433 In considering sustainability we have assessed whether electrical power asset performance and condition measures can be maintained in the long-term without an undeliverable spike in work volume. In its SBP, Network Rail has forecast renewals expenditure and remaining life over control periods CP5 to CP11. It forecasts that the

long-term profile of expenditure will be reasonably steady, between £0.8bn and £1bn in most control periods. The average remaining life is forecast to reduce from 61% to 51% by CP11. This forecast reduction appears reasonable given the substantial programme of electrification that is planned for CP5.

8.434 The long-term forecasts of electrical power expenditure and condition outputs are based primarily on the central models. The disconnect between central modelling and the bottom-up workbanks that represent the actual work forecast on-site raises similar issues to those raised in our test of robustness.

8.435 The electrical power asset base is varied and includes both linear (for example cables and overhead lines) and point assets (for example switchgear and transformers). To select the assets to be analysed Network Rail has completed an asset criticality ranking using parameters including previous expenditure and impacts on performance, safety environment, operating costs and system capability. This asset criticality prioritised the following assets for whole life costs analysis:

(a) overhead line equipment;

(b) signalling power supply systems (PSPs and signalling power distribution cables);

(c) HV switchgear for the AC and DC electrification systems;

(d) conductor rail; and

(e) HV cables on the DC electrification systems.

8.436 Network Rail has used a sound approach to the whole life cost modelling. However, the determination of optimum efficient plans using whole life cost analysis tools is highly dependent on the quality of information used as inputs and assumptions. Network Rail has recognised the quality of asset data for electrical power assets has not been good and has developed programmes to improve this. Due to the time this takes, Network Rail has used expert knowledge supported by sensitivity analysis to determine degradation rates rather than comprehensive asset information.

8.437 Network Rail's centrally modelled figures are derived in a strategic planning model. This uses outputs from the whole life cost models and applies the policy to the electrical power asset base. This further emphasises the requirement for reliable asset inventory data to ensure the outputs of this model will provide a robust forecast

of expenditure. The whole life cost models have influenced approximately 50% of the expenditure forecast in the SBP for electrical power renewals.

8.438 The electrification and power model was found to be consistent with policy. No material issues were found with computational accuracy in modelling costs and volumes for CP5.

Efficiency

8.439 We have assessed the electrical power efficiency initiatives proposed and agree they should deliver long-term efficiencies. Network Rail has carried out benchmarking against the electricity distribution and transmission industry. Arup's review of Network Rail's work to assess potential electrical power renewal efficiencies concluded the initiatives are well founded in terms of the range and scope covered. Network Rail's route teams have also included some locally derived efficiencies. The routes have not provided detailed delivery plans for these additional efficiencies. Due to the relatively robust approach Network Rail has taken to developing the majority of its electrical power and fixed plant efficiencies, we have applied 75% weighting to its analysis and 25% to our analysis.

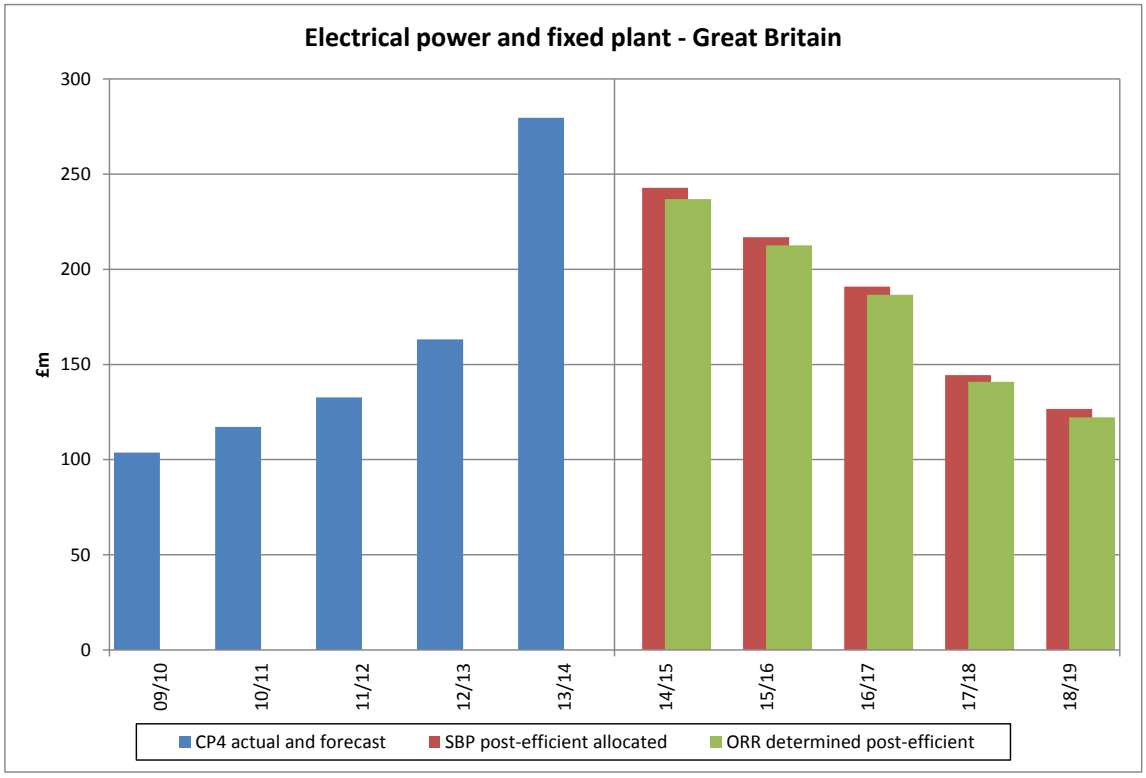
Findings

8.440 Our assessed efficient expenditure for electrical power and fixed plant renewal is illustrated below. We accept the need for an increased level of expenditure relative to CP4. This is driven by the new asset policy which requires more mid-life refurbishment, by the advanced renewal of electrification assets due to enhancement works and by new information which has revealed the need for high levels of signalling power cable renewals to address a backlog of work. The high expenditure in the final year of CP4 is due to a large increase in expenditure on overhead line renewals, DC distribution renewals, supervisory control and system capacity improvements. The profile in CP5 is largely driven by high levels of efficiency, including efficiency from application of the new asset policy.

Table 8.35: ORR assessed costs, electrical power and fixed plant renewals, Great Britain

£m (2012-13 prices)	CP4			CP5			CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Pre-efficient expenditure	-	279	266	244	195	173	-	1157
Efficiency	-	15.1%	5.7%	4.4%	5.7%	2.4%	-	29.5%
Post-efficient expenditure	280	237	213	187	141	122	797	899

Figure 8.14: Our assessment of efficient expenditure for electrical power and fixed plant renewals



Telecoms assessment

Asset data

8.441 Network Rail's telecoms plans are based on asset knowledge collected through its Telecoms Decision Support Tool (DST). This provides a structured approach to collection of telecoms asset data and renewal planning at half nominal life and 2 years prior to nominal renewal date. The DST system is currently spreadsheet based and would benefit from being moved to a more robust and controlled platform. Ellipse is

used as the telecoms asset register. There is currently no direct link between Ellipse and the fault management system (FMS). Asset information management and data quality is being addressed through the Asset Data Improvement Programme (ADIP) and ORBIS.

Unit costs

8.442 The independent reporter's audit of telecoms unit costs found that a high proportion (52%) of telecoms plans was based on non-unitised costs. The projection of these costs and their overlays (e.g. 'abnormals') has not been supported by sufficient evidence and this results in a higher uncertainty relating to telecoms pre-efficient expenditure forecasts. Network Rail's unit costs are built up using an appropriate methodology but treatment of risk and contingency is not clear and, as with other asset categories, no programme level view of risk estimation has been demonstrated. We have applied a 2% reduction to account for duplication and overestimation of risk overlays.

Policy and modelling

8.443 Network Rail Telecoms (NRT) was set up in August 2011, partly in recognition of the need to manage the telecoms assets on a holistic basis, over the full life of the assets.

8.444 Network Rail recognises that its assets, in particular the Fixed Telecoms Network (FTN), have potential benefits both in terms of added services and commercial opportunities. However, the CP5 SBP submissions exclude all commercial activities, costs and revenues.

8.445 Network Rail has carried out whole life cost modelling in support of its telecoms asset policy. This is a positive step but we consider that the modelling does not yet provide sufficient coverage of the asset base. In depth modelling has only been carried out for processor controlled concentrators. The modelling has been hampered by data quality with extra work carried out to verify FMS data. There is therefore potential for further optimisation of the policy through wider use of the model and improved input data. The policy proposes a move to a more targeted approach of component renewal to maximise the asset life, integrated with programmes of major interventions relating to NOS. This approach appears sound.

8.446 Telecoms maintenance regimes are to be based on the criticality of the asset and based around delivery of Service Level Agreements (SLA) with NRT's clients, the

routes. SLAs have not been implemented or fully tested and it will not be clear whether the proposed SLAs are appropriate until the middle of CP5. We therefore do not yet consider that delivery of SLAs has been demonstrated to be a robust or sustainable way of maintaining the assets.

8.447 The asset policy document does not capture the portfolio of telecoms assets consistently. This needs to be resolved to ensure robust reporting in CP5. The policy is also unclear on asset ownership.

8.448 Network Rail has developed its CP5 plans based on application of the policy. Its plans show a reduction in overall expenditure from CP4 driven by the completion of two major programmes of work: GSM-R and FTN.

8.449 We have made adjustments to the pre-efficient plans for telecoms renewals where Network Rail has not provided sufficient information to justify them. We have reduced expenditure by £33m in the first year of CP5 where plans submitted are not in line with the plans submitted by NRT and smaller adjustments in later years.

8.450 The telecoms model was found to be consistent with policy. No material issues were found with computational accuracy in modelling costs and volumes for CP5.

Efficiency

8.451 Our assessment of the efficiencies available for telecoms renewals has found opportunities in the development and sharing of smoothed workbanks, improved management of the supply chain and through application of innovative solutions. We find a slightly lower overall efficiency available than Network Rail's own analysis.

8.452 The reporter's audit of Network Rail's telecoms benchmarking and efficiency found that both internal and external benchmarking was limited in coverage and identified efficiencies were not reflected in CP5 workbanks. We have given higher weight (75%) to our analysis given our view of the quality of Network Rail's benchmarking and efficiency analysis.

Routes

8.453 There are no specific route plans for telecoms with assets remaining under the direct control of NRT, but route staff are used to provide first level failure response.

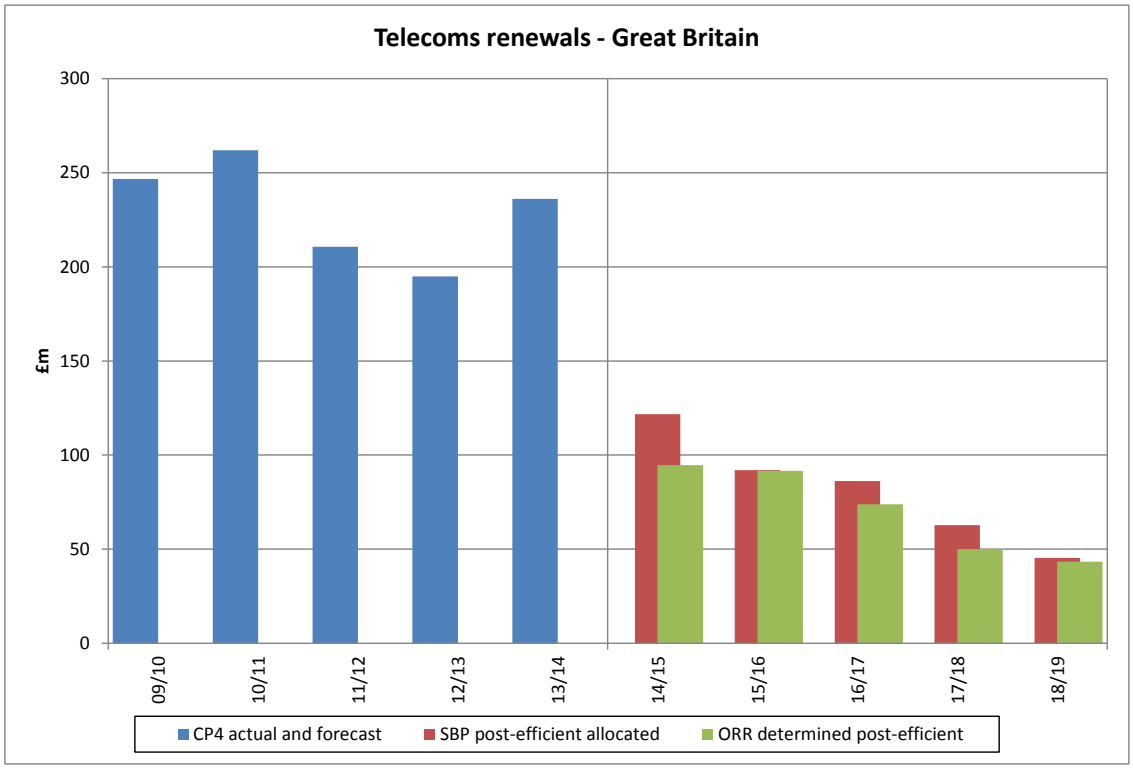
Findings

8.454 Our assessed efficient expenditure for telecoms renewals is illustrated below.

Table 8.36: ORR assessed costs, telecoms renewals, Great Britain

£m (2012-13 prices)	CP4			CP5			CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Pre-efficient expenditure	-	98	98	82	58	52	-	388
Efficiency	-	3.7%	3.4%	3.5%	3.3%	3.6%	-	16.2%
Post-efficient expenditure	236	95	92	74	50	43	1150	354

Figure 8.15: Our assessment of efficient expenditure for telecoms renewals



8.455 Expenditure in CP5 is markedly lower than in CP4 due to the completion of major programmes of work delivering FTN and GSM-R.

Wheeled plant assessment

Asset info

8.456 Network Rail acknowledges that the current level of information available for wheeled plant is inconsistent and limited, which is largely a function of the existing contractual arrangements. This is disappointing, but Network Rail recognises the issue and has taken steps to address this shortcoming through the standardisation of contracts and

population of a fleet database, the Fleet Asset Management System (FAMS). Poor asset information hinders Network Rail's ability to develop an optimised asset policy and this is reflected in our assessment. From the information which is available, fleet condition is shown to be good, with high availability and reliability levels.

Unit costs

8.457 The independent reporter's audit of wheeled plant unit costs has found that a lack of clear evidence that rates have been built up using a robust methodology. It highlights that, for larger bespoke plant items and systems costs will largely be driven by the market's response to a procurement exercise and that this leads to real difficulties in projecting costs. For road vehicles the reporter notes that Network Rail has not considered any residual value at the time of disposal. This supports our adjustment to pre-efficient expenditure on road rail vehicles as described later.

8.458 We have made no adjustment to wheeled plant unit costs for management of risk or contingency as Network Rail has not included any specific allowance.

Policy and modelling

8.459 The wheeled plant policy is a significant improvement on CP4 policy but it is still considered relatively immature. The policy attempts to draw together coherent management plans for an extensive but varied set of assets. The assets vary in terms of age, type and complexity of vehicles, and each has its own set of asset management requirements.

8.460 Following review of the detail that sits beneath the policy we believe that the focus of extending maintenance and overhaul periodicities forms part of a considered and assessed plan for the on-going stewardship of the assets rather than simply a drive to reduce and extend maintenance. We note that the policy does not cover all Network Rail's fleet plans for CP5. The policy only covers those vehicles to maintain the network to the anticipated work volumes. It does not cover route specific vehicles or certain enhancement works, such as Thameslink which has its own provision for fleet procurement.

8.461 The wheeled plant strategic planning model was found to be generally consistent with asset policy, except for the road fleet which was assumed to be replaced every four years (whereas policy states every five). There were no material unexplained issues

with input data and no errors found in computation. We have made an adjustment to expenditure on road vehicles of £3m to reflect this issue.

8.462 Because of the limited information available (as described above), the outputs from the policy are very crudely and loosely defined. Success is proposed to be measured by the delivery of the planned shifts and by having a fleet condition no worse than at exit from CP4. Network Rail has proposed no specific monitoring targets for fleet in CP5.

8.463 We are concerned that there is some disconnect between route plans and central modelling of fleet requirements.

8.464 We have reviewed the costs and volumes included in the SBP which are associated with implementation of the fleet policy. The fleet size required to support the fleet policy is modelled by assessing the projected work provided by the routes with perturbation factors such as the unavailability of possessions and machine failure incorporated. Given the high availability and reliability demanded of the fleet to support the projected work, we are surprised that there has been little consideration of any benefits which could accrue from the provision of additional fleet resource. For example, there has been little consideration of any benefits which could accrue from the provision of additional fleet resource to provide resilience to changes in work demand, fleet performance (especially on critical fleets) or from the point of view of having additional capacity to perform more work.

8.465 Despite our concerns over asset information and demand modelling, we consider that Network Rail has demonstrated that its fleet policy is capable of delivering the planned outputs for CP5. We also consider that it has made the case that the fleet policy is capable of managing the fleet asset sustainably in the long-term. There is further work required to demonstrate how effective the policy would be if faced with a change in the planned outputs, because there appears to be little spare capacity in meeting the planned workload.

8.466 Expenditure in CP5 is forecast to be higher than in CP4. Network Rail has proposed an investment of £141m to make improvements to road rail vehicles, citing improved safety as the main driver for the investment. We have engaged the independent reporter to review the proposal and its report will be finalised shortly. Its findings will be reflected in our final determinations. Further detail is provided in chapter 11.

Efficiency

8.467 Network Rail has provided information on the proposed fleet efficiencies, supported by reasoned justification. The two principal areas proposed are improved procurement and efficiencies in the vehicle maintenance and overhaul process. Our analysis finds slightly higher available efficiencies driven by improved procurement policy. The assumed level of efficiencies is considered challenging but realistic if suitably managed.

Route plans

8.468 There is some discrepancy between fleet policy and fleet requirements as set out in route plans. This has been considered by Network Rail and independently examined with the conclusion that any difference should be manageable.

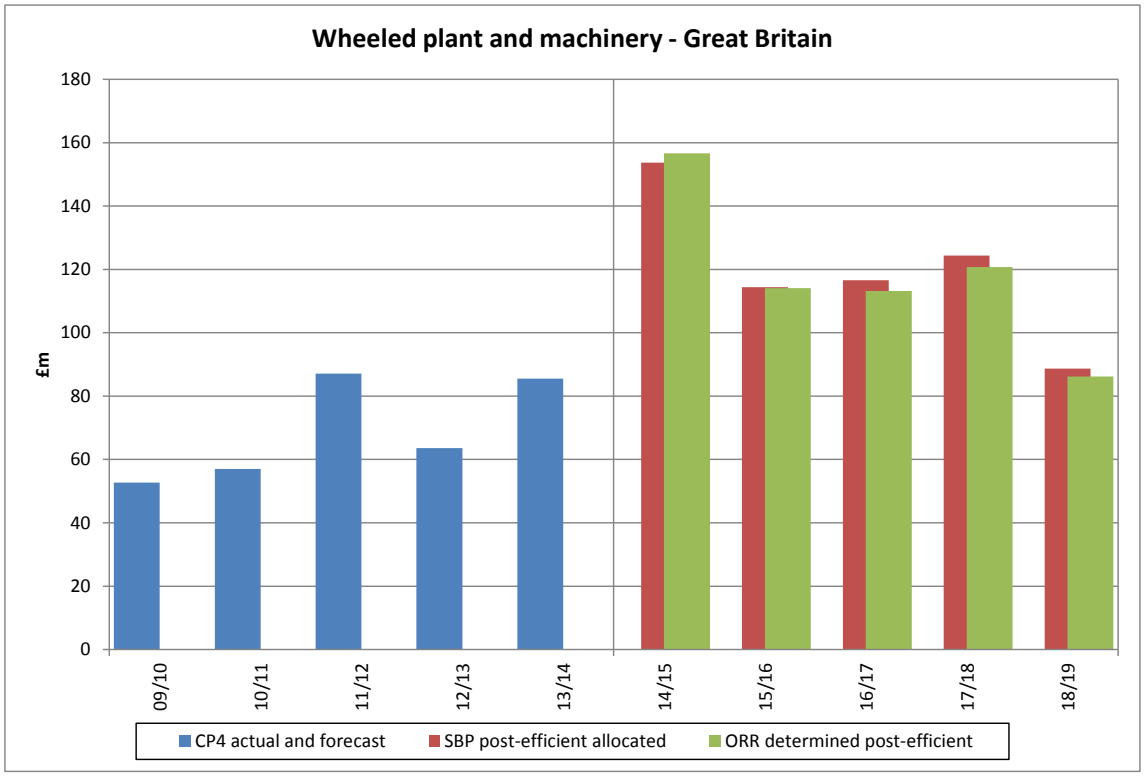
Findings

8.469 Our assessment of the level of wheeled plant expenditure required during CP5 is illustrated below.

Table 8.37: ORR assessed costs, wheeled plant and machinery renewals, Great Britain

£m (2012-13 prices)	CP4	CP5					CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Pre-efficient expenditure	-	167	122	121	130	93	-	634
Efficiency	-	6.4%	0.2%	0.2%	0.2%	0.4%	-	7.5%
Post-efficient expenditure	86	157	114	113	121	86	346	591

Figure 8.16: Our assessment of efficient expenditure for wheeled plant and machinery renewals



8.470 The large increase in expenditure in CP5 is largely driven by increased expenditure on road-rail vehicles and provision of additional high output fleets. The peak of expenditure in 2014-15 is driven by expenditure on high output and seasonal plant.

Other renewals expenditure assessment

IT and asset information strategy (ORBIS)

8.471 Network Rail has proposed an increase in IT expenditure of approximately £150m above CP4 levels. This increase is based on benchmarking against other organisations but no clear plans have been produced for how this will be spent or what it will deliver.

8.472 In addition to this Network Rail has proposed expenditure on ORBIS of £173m during CP5 to deliver improved asset information management. These plans were assessed by the independent reporter, AMCL, in late 2012. The reporter found that the ORBIS vision and roadmap represented a major step forwards in terms of Network Rail's approach to asset information which addresses the existing shortfall between Network Rail's asset information capability and current best practice.

8.473 The reporter found certain elements of the programme that needed further development to address gaps to best practice, particularly the asset information specification and detailed system architecture.

8.474 The initial business case for ORBIS was found to be strong and based on sound evaluation for a programme in its early definition phase. The base case was strongly positive, delivered a good cost-benefit ratio and started delivering a positive net cost-benefit in a short period of time (during CP6).

8.475 We support Network Rail's plans to improve its information management but consider that these plans need to be considered in conjunction with other IT expenditure as both relate to business change programmes and there is not a clear distinction between them. Network Rail has not presented sufficient justification for its proposed increase in IT expenditure over and above its ORBIS expenditure. We have assessed the total efficient expenditure for IT and ORBIS based on a continuation of CP4 levels of expenditure. The company has recently submitted some further evidence which we will consider in our final determination.

Property

8.476 Our assessment of Network Rail's plans for property renewals finds that expenditure levels before efficiency are reasonable but that a higher level of efficiency is available. We assume an efficient level of expenditure of £113m.

Intelligent infrastructure

8.477 We have assessed Network Rail's proposal for expenditure of £95m on further roll-out of remote condition monitoring. The proposed further implementation appears reasonable but we have not yet seen sufficiently detailed plans. We have asked Network Rail to quantify what this expenditure will deliver and it has presented high level information. We expect Network Rail to set out detailed plans, including milestones, in its delivery plan. We will monitor delivery against this plan.

Faster and safer isolations

8.478 Network Rail has proposed an investment of £230m in CP5 for taking safer and faster isolations, citing safety improvements as the main reason for the investment. £90m was proposed for improvements on the AC network and £100m for the DC network. The remaining £40m of expenditure was for further DC improvements. The investment of £190m for taking safer and faster isolations on the AC and DC network

is considered appropriate but we consider that there is insufficient justification for the £40m for further DC improvements. We have applied an efficiency overlay in line with our assessment of efficiency for electrical power and fixed plant renewals. We assess efficient expenditure of £163m.

Alerts for track workers

8.479 Network Rail's proposal for £100m expenditure on a system for providing alerts to track workers is reviewed in chapter 11. We have made an allowance of £10m for the trialling of the proposed system in CP5.

Small plant

8.480 Network Rail's plans for renewal of small plant are considered reasonable and we have made no adjustment, giving efficient expenditure of £51m in CP5.

Research and development

8.481 Network Rail has presented plans for expenditure of £300m on research and development. We fully support an increased focus on research and development. The HLOSs included a £50m innovation fund. In addition to that fund we are developing a matched funding financial incentive as described in chapter 19 and have therefore not included funding for research and development in our assessed renewals expenditure.

Long-run renewals

8.482 Network Rail presented its plans for renewals up to and including CP11. We have conducted a review of these plans including a bottom-up review of plans for CP5 and CP6. We have assumed that the key identified efficiencies will be realized by the end of CP6. Beyond CP6 we have assumed that there will be further, as yet unidentified, efficiency improvements. We have assumed on-going efficiencies of 2% per control period. Our assessment of the long-run renewal expenditure is the average of the efficient renewal expenditure requirements from CP5 to CP11.

Our conclusions – maintenance

8.483 Our methodology as described above has resulted in our judgement on the level of efficient maintenance expenditure Network Rail should need to incur to deliver its required outputs. This is set out in the tables below. In comparison to our advice to

ministers documents, our conclusions on maintenance expenditure are within the range we set out for both Scotland and England & Wales.

8.484 We have made no explicit adjustment to maintenance volumes as proposed by Network Rail. The company will set out its proposed volumes consistent with delivery of its asset policies and maintenance strategy in its delivery plan. The company will need to provide an explanation where its delivery plan volumes are different to the volumes submitted following the SBP, a subset of which is shown in Table 8.1. We will monitor maintenance volumes during the period against its delivery plan. Network Rail will need to provide us with justification for any material divergences between the actual volumes delivered in a year and those forecast in the delivery plan. We will also monitor on a forward looking basis, considering whether the volumes are likely to be delivered.

Table 8.38: ORR assessed costs, maintenance, Great Britain

£m (2012-13 prices)	CP4			CP5			CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Network Rail's SBP								
Pre-efficient expenditure	-	1145	1166	1170	1166	1166	-	5813
Efficiency	-	5.4%	2.6%	2.4%	1.9%	2.2%	-	13.7%
Post-efficient expenditure	982	1083	1074	1052	1029	1006	5406	5243
ORR assessed costs								
Pre-efficient expenditure	-	1131	1154	1156	1154	1154	-	5751
Efficiency	-	4.0%	3.4%	3.5%	3.4%	3.4%	-	16.5%
Post-efficient expenditure	982	1086	1070	1035	998	963	5406	5152

Table 8.39: ORR assessed costs, maintenance, England & Wales

£m (2012-13 prices)	CP4			CP5			CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Network Rail's SBP								
Pre-efficient expenditure	-	1036	1048	1053	1051	1056	-	5243
Efficiency	-	5.7%	2.1%	2.5%	2.0%	2.7%	-	14.1%
Post-efficient expenditure	893	977	968	948	927	906	4928	4726
ORR assessed costs								
Pre-efficient expenditure	-	1024	1037	1041	1040	1045	-	5188
Efficiency	-	4.0%	3.4%	3.5%	3.4%	3.5%	-	16.7%
Post-efficient expenditure	893	983	961	931	898	871	4928	4644

Table 8.40: ORR assessed costs, maintenance, Scotland

£m (2012-13 prices)	CP4			CP5			CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Network Rail's SBP								
Pre-efficient expenditure	-	109	118	117	115	110	-	570
Efficiency	-	3.3%	6.7%	1.4%	0.8%	-2.2%	-	9.9%
Post-efficient expenditure	89	105	106	104	102	100	478	517
ORR assessed costs								
Pre-efficient expenditure	-	108	117	115	114	109	-	563
Efficiency	-	3.8%	3.2%	3.3%	3.1%	3.1%	-	15.5%
Post-efficient expenditure	89	103	109	104	100	92	478	508

Maintenance, by asset

Table 8.41: ORR assessed costs, efficient maintenance by asset, Great Britain

£m (2012-13 prices)	CP4	CP5					CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Track							
Network Rail SBP	420	414	404	395	384	372	1969
ORR assessed	420	418	408	393	377	361	1958
Signalling							
Network Rail SBP	158	151	148	146	143	141	729
ORR assessed	158	153	149	145	141	138	728
Civils and buildings							
Network Rail SBP	35	82	82	82	81	82	408
ORR assessed	35	81	81	80	79	79	400
Electrification and fixed plant							
Network Rail SBP	73	85	88	87	87	88	435
ORR assessed	73	90	92	90	87	86	445
Telecoms							
Network Rail SBP	21	21	20	19	19	18	97
ORR assessed	21	21	20	19	18	18	95
Other maintenance							
Network Rail SBP	274	216	213	206	202	196	1032
ORR assessed	274	220	212	203	195	187	1017
Reactive maintenance adj.							
Network Rail SBP	0	115	119	117	113	110	575
ORR assessed	0	103	108	103	99	95	507

Maintenance by route

8.485 Our assessed expenditure on maintenance by route is set out in Table 8.42. These feed into our calculation of the REBS baselines as explained in annex D.

Table 8.42: ORR assessed costs, efficient maintenance by route

£m (2012-13 prices)	CP4		CP5				CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Anglia							
Network Rail SBP	99	104	103	102	99	94	503
ORR assessed	99	103	102	100	96	91	493
East Midlands							
Network Rail SBP	50	58	58	56	54	54	280
ORR assessed	50	56	55	53	52	50	265
Kent							
Network Rail SBP	67	75	73	71	70	68	355
ORR assessed	67	74	72	68	66	64	344
LNE							
Network Rail SBP	154	160	162	158	159	161	800
ORR assessed	154	164	161	154	151	148	779
LNW							
Network Rail SBP	252	271	267	262	255	247	1302
ORR assessed	252	273	265	257	247	240	1281
Scotland							
Network Rail SBP	89	105	106	104	102	100	517
ORR assessed	89	103	109	104	100	92	508
Sussex							
Network Rail SBP	52	57	57	53	52	50	269
ORR assessed	52	57	55	52	51	48	263
Wales							

£m (2012-13 prices)	CP4			CP5			CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Network Rail SBP	52	61	59	59	58	57	294
ORR assessed	52	60	58	57	55	54	284
Wessex							
Network Rail SBP	78	83	82	81	77	73	395
ORR assessed	78	87	85	83	78	73	407
Western							
Network Rail SBP	87	109	108	106	103	103	528
ORR assessed	87	109	108	105	102	102	527

Our conclusions – renewals

8.486 Our methodology as described above has resulted in our judgement on the level of efficient renewals expenditure Network Rail should need to incur to deliver its required outputs. This is set out in the tables below. In comparison to our advice to ministers documents, our conclusions on renewals expenditure are within the range (towards the high end) that we set out for Scotland but above the range we set out for England & Wales. This is driven by a large increase in Network Rail's pre-efficient plans between the IIP and the SBP, particularly relating to civils renewals, accelerated track renewals, IT and other investment expenditure.

8.487 The company will set out its proposed renewals volumes consistent with delivery of its asset policies in its delivery plan. The company will need to provide an explanation where its delivery plan volumes are different to the volumes submitted in the SBP, a subset of which is shown in Tables 8.11 to 8.13. We will monitor renewal volumes during the period against its delivery plan. Network Rail will need to provide us with justification for any material divergences between the actual volumes delivered in a year and those forecast in the delivery plan. We will also monitor on a forward looking basis, considering whether the volumes are likely to be delivered.

Table 8.43: ORR assessed costs, renewals, Great Britain

£m (2012-13 prices)	CP4			CP5			CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Network Rail's SBP								
Pre-efficient expenditure	-	3017	3202	3243	3163	3129	-	15754
Efficiency	-	8.2%	2.7%	2.8%	1.6%	1.4%	-	15.7%
Post-efficient expenditure	2784	2770	2861	2818	2704	2638	12833	13791
ORR assessed costs								
Pre-efficient expenditure	-	2697	2925	2924	2879	2845	-	14269
Efficiency	-	8.2%	3.7%	4.2%	3.0%	2.8%	-	20.1%
Post-efficient expenditure	2784	2475	2586	2476	2365	2272	12833	12173

Table 8.44: ORR assessed costs, renewals, England & Wales

£m (2012-13 prices)	CP4			CP5			CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Network Rail's SBP								
Pre-efficient expenditure	-	2697	2810	2885	2835	2809	-	14036
Efficiency	-	8.0%	2.8%	2.6%	1.7%	1.5%	-	15.7%
Post-efficient expenditure	2541	2481	2511	2512	2426	2367	11476	12297
ORR assessed costs								
Pre-efficient expenditure	-	2409	2562	2599	2581	2555	-	12707
Efficiency	-	8.2%	3.7%	4.1%	3.0%	2.8%	-	20.1%
Post-efficient expenditure	2541	2211	2264	2202	2122	2042	11476	10840

Table 8.45: ORR assessed costs, renewals, Scotland

£m (2012-13 prices)	CP4			CP5			CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Network Rail's SBP								
Pre-efficient expenditure	-	320	392	358	328	320	-	1718
Efficiency	-	9.7%	1.3%	4.0%	0.9%	0.3%	-	15.5%
Post-efficient expenditure	243	289	350	306	278	271	1356	1493
ORR assessed costs								
Pre-efficient expenditure	-	287	363	324	298	290	-	1563
Efficiency	-	8.3%	3.4%	4.9%	2.9%	3.0%	-	20.7%
Post-efficient expenditure	243	264	322	274	244	230	1356	1333

Renewals, by asset

Table 8.46: ORR assessed costs, efficient renewals by asset, Great Britain

£m (2012-13 prices)	CP4			CP5			CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Track								
Network Rail SBP	816	720	684	725	669	633	3762	3431
ORR assessed	816	705	657	677	612	571	3762	3221
Signalling								
Network Rail SBP	533	765	821	742	616	546	2421	3490
ORR assessed	533	736	787	708	586	519	2421	3335
Civils								
Network Rail SBP	397	565	539	525	506	509	1944	2644
ORR assessed	397	536	510	455	432	430	1944	2362
Buildings								

£m (2012-13 prices)	CP4			CP5			CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Network Rail SBP	216	302	270	242	205	168	1279	1187
ORR assessed	216	211	230	198	187	169	1279	995
Electrical power & fixed plant								
Network Rail SBP	280	243	217	191	144	127	797	922
ORR assessed	280	237	213	187	141	122	797	899
Telecoms								
Network Rail SBP	236	122	92	86	63	45	1150	408
ORR assessed	236	95	92	74	50	43	1150	354
Wheeled plant & machinery								
Network Rail SBP	86	154	114	117	124	89	346	598
ORR assessed	86	157	114	113	121	86	346	591
IT								
Network Rail SBP	80	123	150	123	109	109	467	613
ORR assessed	80	57	63	63	68	86	467	338
Property								
Network Rail SBP	18	23	30	22	28	22	254	124
ORR assessed	18	22	28	20	24	19	254	113
Other renewals								
Network Rail SBP	121	-130	64	164	352	500	148	949
ORR assessed	121	-176	0	83	244	322	148	473
Reactive maintenance adj.								
Network Rail SBP	0	-115	-119	-117	-113	-110	0	-575
ORR assessed	0	-103	-108	-103	-99	-95	0	-507

Renewals by route

8.488 Our assessed expenditure on renewals by route is set out in Table 8.47. These feed into our calculation of the REBS baselines as explained in annex D.

Table 8.47: ORR assessed costs, efficient renewals by route

£m (2012-13 prices)	CP4		CP5				CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Anglia							
Network Rail SBP	237	202	229	275	238	202	1146
ORR assessed	237	184	210	252	214	175	1034
East Midlands							
Network Rail SBP	140	161	146	126	120	109	662
ORR assessed	140	146	132	111	105	93	587
Kent							
Network Rail SBP	214	228	221	198	195	206	1049
ORR assessed	214	205	198	173	171	180	928
LNE							
Network Rail SBP	445	422	475	443	491	536	2367
ORR assessed	445	382	434	392	434	471	2113
LNW							
Network Rail SBP	557	546	560	577	539	534	2755
ORR assessed	557	473	497	498	466	457	2391
Scotland							
Network Rail SBP	243	289	350	306	278	271	1493
ORR assessed	243	264	322	274	244	230	1333
Sussex							
Network Rail SBP	182	169	187	160	172	154	842
ORR assessed	182	151	171	140	152	131	745
Wales							

£m (2012-13 prices)	CP4			CP5			CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Network Rail SBP	168	195	157	165	123	115	755
ORR assessed	168	173	140	143	108	100	664
Wessex							
Network Rail SBP	200	219	216	261	249	211	1156
ORR assessed	200	190	190	225	217	180	1003
Western							
Network Rail SBP	303	339	320	307	298	301	1565
ORR assessed	303	307	291	268	255	254	1375

International top-down benchmarking

8.489 Benchmarking a firm's costs to those of its peers is widely used among regulators to help inform the scope to which there may be opportunities to improve efficiency or reduce cost. This approach formed an important element of ORR's assessment at PR08, and for this periodic review we have updated the previous models and approaches used, developed these to take advantage of developments in the field, and addressed some of the questions raised following the PR08 analysis. We are grateful to the Institute for Transport Studies at the University of Leeds for the technical advice and support they have provided to this work, in particular their assistance in identifying and making use of developments in the field since our PR08 work.

8.490 Given Network Rail's position as a national monopoly without similar domestic comparators, it is natural to look to the managers of rail infrastructure in other countries to inform comparisons. This is where international benchmarking can provide important insights into how overall costs of operating and maintaining railways can vary across countries.

8.491 In comparing across countries it is important to choose a set of comparators that have reasonably similar operating conditions so that efficiencies can be separated out from other factors. In selecting the comparators we have focused on other European countries for which data are available and the infrastructure and operating conditions

are broadly similar. Analysis has also been undertaken to gauge how sensitive the results are to this selection of comparators.

8.492 Even if comparators are similar it is inevitable that differences will remain. For example, the exact size of the network, balance between single and multiple track, and intensity of usage will all vary from country to country. These all impact on the costs of maintaining and renewing the network, and the relationship between these variables and overall cost is not necessarily straightforward. For example it is not necessarily the case that a railway double the size of another will incur double the cost. To estimate how much each of these factors impact on overall costs we use statistical techniques to estimate the relationships.

8.493 After these techniques have been used, the remaining differences in the data between countries (the 'residuals') will then comprise random differences between countries (for example due to natural events in a particular year), differences between countries due to factors that cannot be directly taken into account (for example different reliability requirements for which consistent cross country information is not available), and true underlying differences in efficiency. The objective of this work is to identify these true underlying differences in efficiency. The following section sets out a summary of a range of statistical techniques and approaches to do this.

Approaches

8.494 There is a wide set of statistical techniques available to benchmark costs across countries. These all use the data to estimate an efficiency 'frontier', which can be set by the best performing firm in the sample (either overall, so taking all years available into account, or for a particular year), or an adjusted frontier which takes into account some of the unobserved factors mentioned above. The distance from any particular firm to this frontier provides a measure of its inefficiency. All these approaches have a common limitation in that they are derived from the data itself, and so the frontier has to be defined by the set of counties included in the dataset. If there is a more efficient country for which we do not have data, the frontier will not be as challenging as it could be, resulting in inefficiency estimates that are systematically conservative.

8.495 There are two main approaches that have been used in this work. These are models using Corrected Ordinary Least Squares (COLS) and Stochastic Frontier Analysis (SFA).

Corrected Ordinary Least Squares

8.496 This approach is the starting point for our analysis. It is a relatively simple approach, commonly used by regulators, where the model produces a line of best fit to the data, so that around half the firms are above the modelled estimate of cost and half below. To this the lowest cost firm is then identified as the efficient frontier, and the line of best fit adjusted so that only one firm in on this line, and all others have higher costs. The distance of a particular firm from this line provides an estimate of its inefficiency. As this estimate includes both true inefficiencies, unobserved factors and any errors, it is likely to overstate efficiency gaps in general. As such we make an adjustment to the estimate to reflect these unobserved factors. Given that they are unobserved any adjustment is, to some extent, a matter of judgement. For this work we have reduced estimates by 25%.

Stochastic Frontier Modelling

8.497 This approach differs from COLS in that it attempts to separate out true efficiency from other random variations in efficiency (e.g. one-off natural events). It does so by fitting the model in a fairly similar way and then examining the differences between modelled and actual numbers. In a typical statistical analysis one might expect these differences (the residuals) to follow a normal distribution. But in efficiency modelling we may expect a skew, reflecting the fact that there will be a number of inefficient firms, but only one efficient one. The approach uses this skew to decompose this residual into true 'noise' and residual efficiency. Taking account of this noise in the model estimation in this way should, all else being equal, yield a more accurate estimate of inefficiency. As such this approach has generally been a focus of our analysis.

Data

8.498 Our analysis has focused on the Lasting Infrastructure Costs Benchmarking (LICB) dataset compiled by the International Union of Railways (UIC). There are currently 14 European rail infrastructure managers participating in this dataset, of which ten have been used in our analysis.[140] We are grateful to the UIC for providing us with access to their dataset, and to Network Rail for working constructively with us in its use. The

[140] These are Austria, Belgium, Finland, Germany, Italy, the Netherlands, Norway, Sweden, Switzerland, and the United Kingdom. Other countries have been excluded either due to non-comparability (e.g. non-similar operating or infrastructure conditions) or data limitations.

dataset covers the period 1996 to 2010, and Table 8.48 sets out the variables used from this dataset in our analysis.

Table 8.48: LICB dataset – variables used in analysis

Costs	Network size	Network usage	Network characteristics
Total maintenance and renewal costs	Track km	Passenger train km	Proportion of single track
Maintenance costs	Route km	Freight train km	Proportion of electrified track
Renewal costs	Single track km	Total train km	Passenger train density on network
	Electrified track km		Freight train density on network
			Total train density on network

8.499 In order to make the cost data comparable across countries we have made an adjustment to a common currency using GDP Purchasing Power Parity (PPP) exchange rates. We have also adjusted the data to constant prices. As such overall price differentials (such as wages) are taken into account at an economy wide rather than at a rail specific level. As a sensitivity test we have also adjusted using construction cost PPP, but do not consider this to be the best way of normalising the data. This is because it is not clear that a general construction industry correction factor is well-suited for specific track related renewals and maintenance, that the use of a narrower PPP definition necessarily increases data uncertainty, and the models are generally more unstable when construction PPP is used.

8.500 Following the analysis undertaken for PR08 a set of concerns have been raised regarding the quality of the LICB dataset. We have investigated these, and sought to develop our approach to overcome them as far as is possible. Table 8.49 lists the main concerns and the steps we have taken to investigate and address these.

Table 8.49: Concerns raised regarding the LICB dataset

Concern	Steps taken
Data anomalies where certain years' values are missing or volatile	We have conducted a detailed review of the LICB dataset using a number of different approaches to identify outlying observations. Where outliers have been identified and robust explanation has been provided, we have accepted this, otherwise where a clear data entry error has been made we have applied a correction. Where this has not been possible, or concerns on the overall integrity of the data remain, we have removed the relevant country entirely from our analysis. To account for any additional unidentified data uncertainty, we have also undertaken Monte-Carlo simulation where we have applied a 5% uncertainty factor to each observation in our dataset. The results of this indicate our efficiency results remain robust to this additional uncertainty.
Renewals expenditure may be classed as enhancements by other IMs	This should be more of a historic issue as revised definitions of maintenance and renewals (aimed specifically at achieving consistency) were agreed amongst the LICB participants in 2009. Additionally, we have used adjusted renewals data supplied by Network Rail in our analysis. This has retrospectively adjusted Network Rail's costs back to 2003 to match the revised definitions. We have also conducted additional analysis to accommodate the possibility of systematic misreporting: • our data integrity analysis has looked at maintenance renewal splits by country and these variables over time to try to detect and resolve any changes in behaviour, and cross-country outliers; and • we have looked at the effects of removing countries about which Network Rail have raised concerns on overall efficiency scores, in particular where those countries have set the frontier.

Concern	Steps taken
Some countries may not be renewing at 'steady state' rates	The average track reported renewal rate for countries in our dataset is 2.6%, which is higher than that stated by Network Rail in its CP4 track asset policy. Additionally, Switzerland, the Netherlands and Germany all report rates higher than this average. All else being equal countries with higher renewal rates should incur additional costs, and therefore be less likely to set the frontier. We do not have sufficient evidence available to make steady state adjustments for other countries, and view that making such adjustments across the board would introduce a significant degree of artificiality into the data. As such we have not made systematic adjustments for our analysis. Also: • we find that Network Rail's efficiency score is not generally being lowered by the presence of other countries in the dataset with lower than average rates of renewal. Our analysis shows that countries with low rates of renewal are not always setting the frontier – in other words, it does not appear that our models find those countries that are renewing less than average to be more efficient; • we have, in-line with our PR08 work, adjusted Network Rail's costs by the CP4 steady state rate of track renewal outlined in their track asset policy of 2.3%. This is to accommodate the shifts in renewals volumes experienced as a result of the transition from Railtrack to Network Rail; and • where clear evidence of change in renewals behaviour is evident in the dataset we have excluded the relevant country from the analysis.

8.501 Overall, we consider the LICB dataset to be of a sufficient quality to enable meaningful results to be drawn from analysis, and for this analysis to play a useful cross-check to other efficiency estimates included in this document.

Analysis

8.502 In undertaking our work we have tested a large variety of cost functions. Our preferred cost specification considers total maintenance and renewals expenditure as a function of track km, passenger train density, freight train density, the proportion of single track on the network, and time. This specification has been determined by economic and engineering analysis along with checks of parameter values and stability against a range of models. We have also tested additional variables to these but generally found them to be insignificant or inconsistent with theory.

8.503 We consider that these variables capture the most significant characteristics relevant for modelling, with for example the vast majority of the variation in costs in the data (over 80%) explained by the length of track alone. We have also tested alternative

econometric frameworks designed to take omitted variables into account but not found the results from these models to be credible. Further we have tested specific adjustments for omitted variables in our analysis, and found these to be insignificant in the models considered.

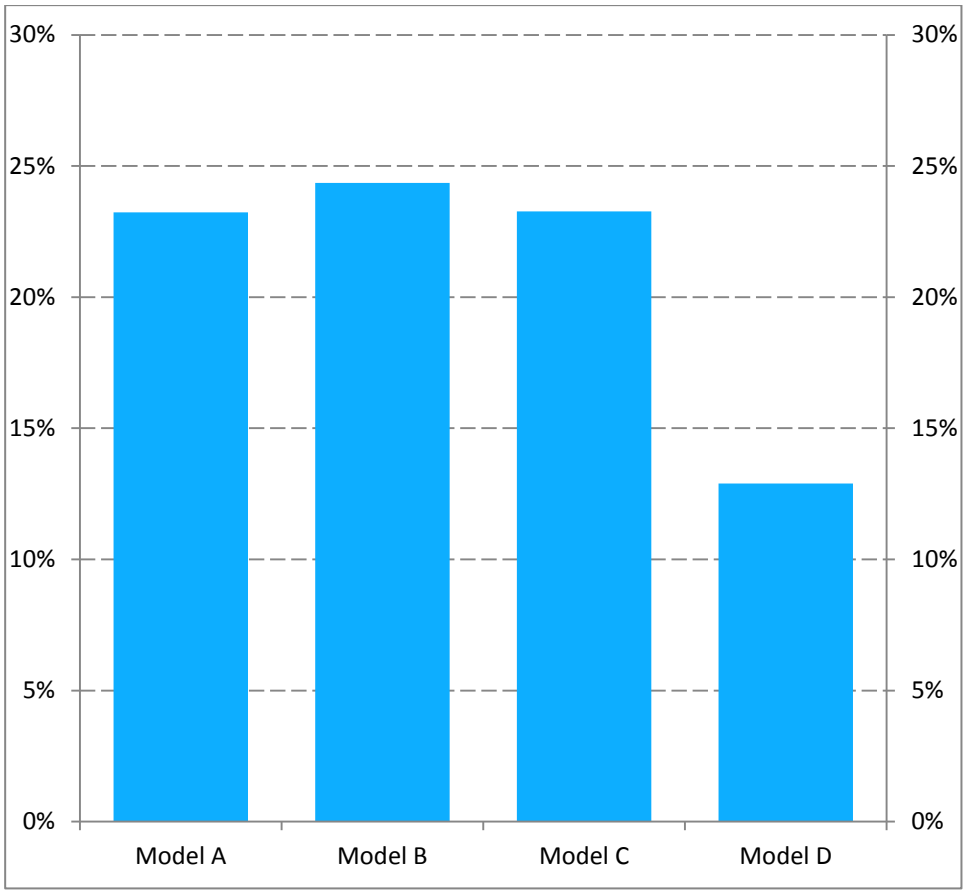
8.504 To this cost function we have then tested a wide set of efficiency models. We have tested our models for overall theoretical plausibility (so are the assumptions underpinning the model plausible), parameter plausibility (from an economic and engineering perspective), parameter stability (under the removal/addition of countries, years, or data perturbations), and finally plausibility of the efficiency estimates (so is there variation across countries and years, and does the spread look intuitively sensible).

8.505 Following this process there are four models which pass all of our tests. We consider all of these models to be sufficiently robust from an econometric and engineering perspective, and to provide a reasonable model of a reality which is fundamentally unknown. Rather than choosing one of these specifications as the 'preferred' approach, we instead accept there is inherent uncertainty as to the true model and have carried all of these models through to our results. As such we provide a range of inefficiency estimates for Network Rail. We view this approach as fairer and more transparent than selecting just one model.

Overall Results

8.506 Figure 8.17 below shows the results from each of the models we consider to be robust. This analysis produces a distribution of possible efficiency gaps for Network Rail in 2010 ranging from 13% to 24%. Looking at only the models that are not at the upper or lower end of this range would result in an efficiency gap estimate of 23%.

Figure 8.17: Estimates of Network Rail's efficiency gap with preferred models



9. Enhancements expenditure

Key messages in this chapter

- Enhancements are projects which improve the capacity or capability of the network, such as electrifying the Great Western Main Line or reinstating the line between Edinburgh and Tweedbank.
- The HLOSs set out a substantial programme of work, which was welcomed by the industry. Network Rail has set out its plans, which will bring major benefits for passengers and freight customers, including new journey opportunities, more frequent services and longer trains. It proposed 61 projects in England & Wales and 12 in Scotland, with a proposed cost of £12.4bn, including the ring-fenced funds. This compares to £9.3bn in the 2008 determination and £11.3bn of forecast spend[141] by Network Rail in CP4. Of this approximately 30% is for a major programme of electrification schemes. A further 25% is for Crossrail and Thameslink. 8% relate to two key major capacity and connectivity programmes (Northern Hub and East West Rail). The remaining Scottish projects add up to 8% and a further 11% is made up by a package of ring-fenced funds (six in England & Wales and five in Scotland).
- Of the £12.4bn there are about £3.3bn of costs for projects determined outside of the review (Thameslink, Crossrail, some EGIP elements and Borders) and £1.3bn of costs for ring-fenced funds. We scrutinised the remaining £7.8bn which we reduced to £7.2bn, largely as a result of applying Network Rail's own efficiency overlay to more projects where it was reasonable to do so and reducing risk allowances where we concluded that the levels were too high. Part of our assessment benchmarked costs, such as project management, which we compared with equivalent ones in global rail, water and aviation sectors.
- Whilst some of the SBP supporting documents were to a good standard, there was a lot of inconsistency in the quality and completeness of the information supplied which meant that more had to be provided later after we had started our assessment.

[141] Forecast spend is more than the 2008 determination because the governments have funded additional schemes since 2008 and there are other projects funded by third parties which were not part of the 2008 review.

Key messages in this chapter (continued)

- Many of the projects (approximately £7bn) are at an early stage of development. This meant that a determination of efficient cost was difficult due to the high allowances for risk and uncertainty inherent to projects at this stage. It also meant that Network Rail has not yet been able to involve train operators fully in some of the projects to make sure that scope is best value. Because of this we have decided to take a different approach to securing efficiency and value for money for these projects. We have included a provisional level of funding in the settlement, based on our current judgement. As costs become more certain and risk profiles more accurate Network Rail will resubmit these and we will review them again. As part of this process we expect Network Rail to demonstrate how it has worked closely with train operators and suppliers in defining project scope. We are allowing Network Rail to reach agreement with operators about sharing cost savings from their engagement in project development and delivery.
- The list of projects proposed by Network Rail meet the requirements of the HLOSs, although in Scotland there were two projects in the SBP, namely Carstairs journey time improvements and Edinburgh South Suburban electrification, that are not required by the Scottish HLOS. We have therefore not included them in our assumed level of expenditure, but this does not prevent either scheme being taken forward in CP5 should funding be identified.
- For other projects in Scotland we have already agreed the costs for Borders and some elements of the Edinburgh to Glasgow Improvement Programme (EGIP). For the remaining projects we have decided to treat them along similar lines to the projects in England & Wales, where we will undertake a further review when they have reached a more mature stage. The remaining elements of EGIP will be subject to bespoke target price arrangements, but all other projects will be included in the underspend/overspend framework (RAB roll forward policy) that we will continue in CP4 to incentivise efficient project delivery.
- Outputs of the programme will be published in the enhancements delivery plan (March 2014), with key milestones. These will be fixed around the timings of what Network Rail needs to do in delivering better service outputs for passengers and freight customers.

Key messages in this chapter (continued)

- The Strategic Freight Network has been widely supported in CP4 and is delivering infrastructure for more capacity and longer trains where it is needed. The fund will continue in England & Wales and a new fund will be created in Scotland.
- In this chapter we also set out the principles for how the ring-fenced funds (£1.3bn) will be governed and how we will ensure value for money. Generally, stakeholders have been well engaged in the management of CP4 funds through working groups. However governance arrangements have not always been sufficiently formalised, and passenger groups are not well represented. In some cases reporting at fund-level has not been sufficiently visible to stakeholders. We will make sure that in CP5 passenger and freight customer interests are clearly reflected in the governance of the funds and issues that matter to them are considered when schemes are selected.

Introduction

9.1 This chapter covers:

(a) a recap on the enhancements programmes announced in the two HLOSs;

(b) an overview of Network Rail's proposals, as set out in its SBP;

(c) an explanation of what decisions we make at this stage of the review, setting the context for our conclusions;

(d) the major issues we faced in assessing enhancements, such as deciding on efficient costs and the treatment of risk; and

(e) our conclusions on the enhancements portfolio and ring-fenced funds for Scotland and for England & Wales.

Enhancements in the HLOSs

England & Wales

9.2 The Secretary of State specified the increase in passenger capacity that should be delivered in CP5. This is defined in a capacity metric that identifies the additional number of passengers that should be accommodated on services into major cities[142]

[142] Birmingham, Manchester, Leeds, Bristol, Leicester, Liverpool, Newcastle, Nottingham, Sheffield

and the main London termini[143]. In addition to this specification the Secretary of State named a number of projects that the government wishes to see progressed. This included projects already under way (such as upgrading Birmingham New Street and Reading stations) and new projects such as the electric spine and electrification in South Wales.

9.3 The Secretary of State also made provision for six ring-fenced funds:

(a) £200m for a Strategic Rail Freight Network to fund improvements defined by the industry;

(b) £240m for East Coast Connectivity to improve capacity and reduce journey times on the East Coast Main Line;

(c) £300m for Passenger Journey Improvement to fund journey time and performance improvements;

(d) £200m for Station Improvement with up to half of this funding easier access for disabled passengers;

(e) £140m for Development to fund innovation and potential schemes for CP6; and

(f) £65m for Level Crossing Safety to reduce the risk of accidents at level crossings.

Scotland

9.4 The Scottish Ministers required Network Rail to deliver the following projects:

(a) Edinburgh to Glasgow Improvements Programme;

(b) Borders Railway;

(c) Aberdeen to Inverness Rail Line Improvements Phase 1;

(d) Highland Main Line Rail Improvements Phase 2;

(e) a rolling programme of electrification; and

(f) Motherwell signal box re-signalling and Motherwell Depot stabling.

9.5 They also established five ring-fenced funds:

(a) £30m for a Scottish Stations Fund to improve access to railway services;

[143] Blackfriars, Euston, Fenchurch Street, Kings Cross, Liverpool Street, London Bridge, Marylebone, Moorgate, Paddington, St. Pancras, Victoria, Waterloo

(b) £30m for a Scottish Strategic Rail Freight Investment Fund to encourage growth in rail freight and reduce emissions;

(c) £60m for a Scottish Network Improvement Fund developing the capacity and capability of general infrastructure and network communications systems;

(d) £10m for a Future Network Development Fund developing proposals for CP6 and beyond; and

(e) £10m for a Level Crossings Fund.

Network Rail's enhancements proposals – overview

9.6 Network Rail has developed a portfolio of enhancement projects to meet the requirements of the HLOSs.

9.7 As well as the main SBP documentation, Network Rail submitted a large amount of project-specific supporting information, including client briefs, feasibility reports, cost estimates, efficiency and risk methodologies and a summary of project costs.

9.8 Whilst some of the documents were to a good standard, there was a lot of inconsistency in the quality and completeness of the information supplied. There was also little in the way of whole life cost justification for the selected options. Of most concern to us was inconsistency between project estimates, engineering reports and costs included in the SBP which had to be supplemented by further information later after we had started our review.

9.9 There was a further challenge categorising project costs in a consistent manner, for example isolating direct costs (such as engineering works) and indirect costs (such as project management), and separating risk allowances from the cost estimate of the works. This was necessary so that we could analyse and benchmark costs across different projects; for example we found that the direct costs for some of the comparable electrification activities had a wide variation for what is standardised work.

England & Wales

9.10 The SBP set out a list of 61 projects and six funds with a proposed cost of around £11bn which Network Rail considered necessary to meet the HLOS. These have been categorised as: committed schemes; named schemes; HLOS capacity schemes; ring-fenced funds and others.

Table 9.1: Summary of Network Rail's proposed project costs by category

£bn 2012-13 prices	SBP
Committed Projects (e.g. Thameslink and Great Western electrification to Swansea)	6.2
Named Schemes (e.g. electric spine, links to airports and Waterloo station)	2.2
HLOS Capacity Metric (e.g. Chiltern platform lengthening)	0.9
Funds	1.2
Other projects (including the CP4 schemes continuing into CP5)	0.5
Total	11.0

9.11 Of the England & Wales total approximately 30% of costs are for Crossrail and Thameslink. A further 30% are for a major programme of electrification schemes (about 3% for electrification of the Welsh Valley Lines). 10% of costs relate to two key major programmes (Northern Hub and East West Rail) with a further 8% of costs made up by a large number of smaller capacity schemes that will ensure that the extra number of passengers expected to arrive at key stations around the country is met.

9.12 Network Rail develops projects through the Governance of Railway Investment Projects (GRIP) framework[144], which sets out various stages in a project lifecycle. Table 9.2 shows that there are a number of schemes at an early stage of development, with about two thirds having not yet completed the option selection stage.

9.13 Network Rail proposed in its SBP that the outputs and funding for some of these only be fixed once they reach a later stage when a single option has been selected. This was the main issue we faced in determining efficient costs and is explained more fully in the section 'major issues in assessing enhancements'.

[144] http://www.networkrail.co.uk/aspx/4171.aspx.

Table 9.2: Stage of Network Rail's project development at the time of the SBP

Stage of project development	SBP value £bn (2012-13 prices)	Number of projects
Output undefined – GRIP 0	1.8	15
Output definition – GRIP 1	0.5	11
Pre-feasibility – GRIP 2	2.7	17
Option selection – GRIP 3	0.3	5
Single option development – GRIP 4	0.1	2
Construction, testing and commissioning – GRIP 5	0.3	6
Programmes (Crossrail, Thameslink, Northern Hub and IEP)	4.0	5
Ring-fenced funds (SFN, etc.)	1.2	6
Total	11.0	67

9.14 The list of SBP projects was derived from modelling the effects of different options on the capacity metrics. The 'committed' and 'named' schemes were expected to deliver around 90% of the HLOS capacity metrics. The SBP proposed a further 27 projects costing about £900m to deliver the full metrics. These were informed by the route utilisation strategies[145], which had involved cross industry involvement and wider stakeholder consultation. The portfolio of proposed projects was broadly similar to DfT's illustrative option (which was the list of schemes published by DfT alongside the HLOS and indicated what package would likely meet the capacity metrics).

9.15 There are a number of schemes not required by the HLOS that were included in the IIP. They have not been included in the SBP, but Network Rail and industry partners may continue to explore potential funding sources for them outside of this review, through for example the ring-fenced funds or investment framework.

9.16 The CP5 plans have a total value of around £11bn, compared with about £8.8bn in the 2008 determination (2012-13 prices). On balance Network Rail has a good track record of delivering enhancements in CP4. The redevelopment of Kings Cross station opened on time. Platform lengthening schemes in both the midlands and south east

[145] http://www.networkrail.co.uk/aspx/4449.aspx.

were ready in time for longer trains to run. The second phase of the Thameslink programme allowing more trains to run between St Pancras and Blackfriars and longer trains to run between Bedford and Brighton was completed on schedule.

9.17 In relation to the projects set out in the 2008 determination there have been significant changes during the control period. Some projects have redefined scope or been deferred because less rolling stock has been introduced than originally planned, resulting in about £2bn[146] of reduced spend. About two thirds of this is because the scope of CP4 work for Thameslink, Stafford area improvements and Werrington junction changed which we approved through the change control mechanism[147]. However, this does not reflect the full picture in CP4 because the Secretary of State has announced further schemes since 2008, such as the electrification programmes on the Great Western Main Line and in the north west. Taking these into account Network Rail is expected to spend close to £9bn[148] on government funded enhancements in CP4.

Scotland

9.18 The SBP set out a list of 12 projects and five funds with a total cost of around £1.4bn required to meet the Scottish Ministers' HLOS. Table 9.3 outlines these projects and their stage of development. EGIP is a programme that has individual projects at varying GRIP stages. Some works for Borders have already started on the ground but other elements are still in the planning phase.

Table 9.3: Project costs in the Scotland SBP

Projects and funds (2012-13 prices)	SBP (£m)	GRIP stage
Committed projects		
EGIP Electrification (Springburn to Cumbernauld)	26	4
EGIP Electrification (Glasgow to Edinburgh via Falkirk High)	124	3
EGIP (Edinburgh Gateway Station)	31	3
EGIP Infrastructure works	308	1

[146] Reported in Network Rail's period 13 finance pack.

[147] http://www.rail-reg.gov.uk/server/show/nav.2177

[148] Reported in Appendix 24 of the SBP databook which updates actual and forecast expenditure for CP4 and replaces the 2013 delivery plan update.

Projects and funds (2012-13 prices)	SBP (£m)	GRIP stage
Borders Railway	124	6
Total committed projects	**613**	
Other Scottish projects		
Aberdeen to Inverness improvements Phase 1	280	0
Highland Main Line journey time improvements Phase 2	121	0
Rolling programme of electrification	171	3
Motherwell re-signalling enhancements	3*	0
Motherwell area stabling	10	0
Other projects to meet the outputs	80	0
Total other Scottish projects	**665**	
Funds to deliver specific outcomes		
Scottish stations fund	31	n/a
Scottish strategic rail freight investment fund	31	n/a
Scottish network improvement fund	62	n/a
Future network development fund	10.5	n/a
Level crossings fund	10.5	n/a
Total funds to deliver specific outcomes	**145**	
Total	**1423**	

***** the supporting information provided with the SBP adjusted this from £11m included in the published SBP.

9.19 About 40% of the costs are for the committed projects: increased capacity and faster services between Edinburgh and Glasgow; and the new Borders railway line linking Midlothian and Scottish Borders.

9.20 Network Rail's plans have a total value of around £1.4bn, compared with about £465m[149] in the 2008 determination (2012-13 prices). Since 2008 Transport Scotland

[149] Reported in Appendix 24 of the SBP databook which updates actual and forecast expenditure for CP4 and replaces the 2013 delivery plan update.

has announced a further £518m[150] (2012-13 prices) for EGIP and Borders bringing total CP4 expenditure to about £1bn. Whilst a significant amount will be spent over the next year on EGIP and Borders a number of large projects have already been delivered in CP4, including: a new electrified railway between Airdrie and Bathgate; improvements to the Paisley corridor allowing more frequent and reliable services between Glasgow and Ayrshire.

What we decide in our determination

9.21 This section sets out what aspects of the enhancements portfolio we decide in the periodic review, providing the context for our conclusions.

Outputs

9.22 We said in our outputs consultation[151] that we intended to continue to have milestones for enhancements in Network Rail's delivery plan and to have a change control mechanism. Both these approaches worked well in CP4 and are widely supported. Setting out when it will deliver each stage of a project, and keeping this updated, is useful information for stakeholders and customers. We will use these milestones to monitor whether Network Rail is on course to deliver each project. We will categorise some of the milestones as 'outputs', which means that they will be subject to regulatory enforcement if they are missed or likely to be missed (a further explanation of outputs is set out in chapter 3).

9.23 Although the outcomes of delivering enhancements are not specifically picked up in the National Passenger Survey they can be one of the biggest drivers of customer satisfaction in specific locations or on specific routes where benefits are delivered. Therefore, we will make sure that regulated outputs are based on the timing of the delivery of passenger and freight customer benefits, as this is what matters to customers. These will be finalised in the enhancements delivery plan, which will be published by Network Rail and agreed by us before the start of the control period. A draft will be published in December 2013 and open to wider consultation before being finalised by March 2014. In this way the delivery milestones will reflect stakeholder input, and the main issue here is likely to be ensuring a match between service level

[150] Reported in Appendix 24 of the SBP databook which updates actual and forecast expenditure for CP4 and replaces the 2013 delivery plan update.

[151] http://www.rail-reg.gov.uk/pr13/consultations/outputs.php

changes operators are trying to deliver and Network Rail's infrastructure changes. For example, recognising the difference between Network Rail's obligations and those of other industry partners, matching up the delivery of longer platforms to when longer trains are timetabled to be introduced.

9.24 For projects at an early stage of development the regulated outputs in the March 2014 delivery plan will be to achieve GRIP 3. After that they will be changed to the delivery milestones, when these are further defined.

Efficient costs to be added to the RAB

9.25 Although we do not take decisions on milestones in the determination we have to estimate what level of efficient costs should be added to the RAB, so that Network Rail's revenue requirement can be calculated and access charges set. Key to this is how we treat risk because there is significant risk provision included for many projects that are still at an early stage of development.

9.26 First of all we checked that the proposed projects are required to meet the HLOSs. In England & Wales we verified whether the projects over and above the committed and named schemes are necessary to deliver the capacity metrics.

9.27 We then checked the costs of delivering both the individual projects and the wider portfolio.

9.28 Finally we decided how to incentivise Network Rail to outperform our determination and, alongside this, how to incentivise cross industry working with train operators and the supply chain so that project scope is optimised for best value before the detailed design stage. In CP4 Network Rail has started to engage earlier with the supply chain and employ a radically different relationship through project alliances. We support this initiative and have made sure that we do not prejudice any such commercial arrangements.

Governance of the ring-fenced funds

9.29 The governance arrangements for the ring-fenced funds, including how value for money will be assured, will be finalised in the enhancements delivery plan. However, we have set out in this determination the principles that they must meet.

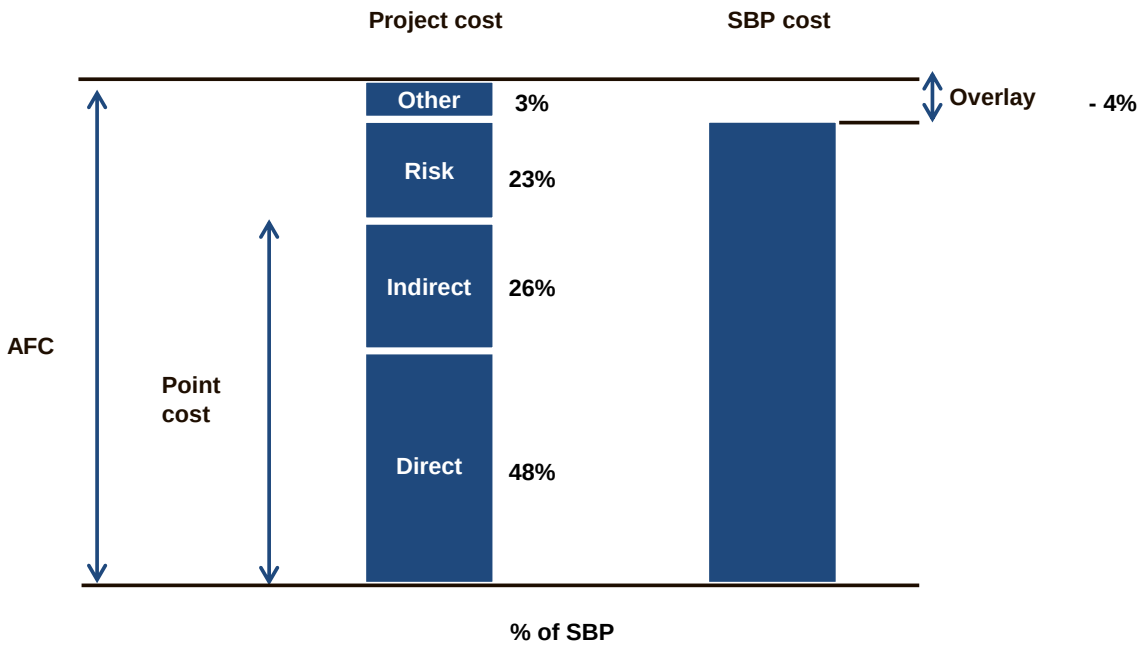
Major issues in assessing enhancements

9.30 Here we set out the major issues we considered in reaching our decisions.

Determining efficient costs

9.31 Determining efficient costs for an enhancement project differs from other areas of expenditure, such as renewals. By their nature enhancements often involve bespoke solutions involving a range of different types of work. For example, an electrification scheme may need to reconstruct a number of bridges as well as erecting overhead wires. This means that, unlike renewals, costing the work is project specific and is not generally based on repeatable work items. Network Rail has built up a cost estimate for each project and applied an efficiency overlay, based on: its own benchmarks; the effects of changes to its project delivery process; and improvements to how it manages its supply chain. It also made some adjustments to take account of risk reduction from delivering a large portfolio of work. This build-up of Network Rail's cost estimates is illustrated in Figure 9.1.

Figure 9.1: Network Rail's build-up of a project cost estimate



9.32 Network Rail's internal benchmarking of unit rates was based on data collected from CP4 projects, but coverage was low in terms of comparable work and the rates only apply to direct costs, such as construction. In addition, Network Rail did not manage

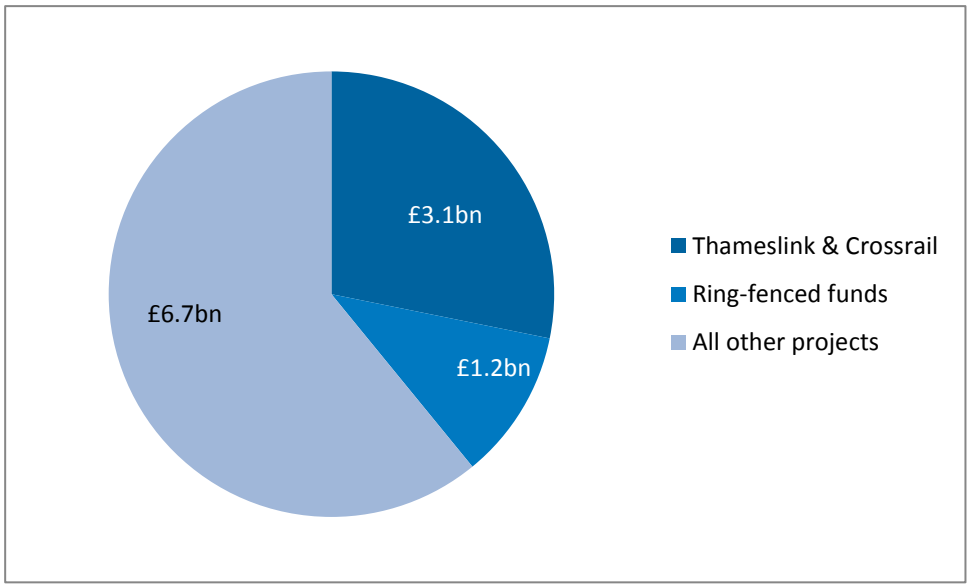
to collect any good quantitative external benchmarking information. We therefore decided to extend the use of benchmarking in our own assessment, particularly to understand indirect costs, such as design or project management, and risk provisions.

9.33 While the total spend on enhancements proposed in the SBP is £11bn for England & Wales, our determination of efficient cost applies to £6.7bn because:

(a) Thameslink and Crossrail total £3.1bn; the costs for these have already been agreed between Network Rail and DfT and both projects are governed by protocols with a pain/gain share mechanism to incentivise efficient delivery; specific contractual arrangements are already in place and we have agreed not to duplicate or cut across these; and

(b) the funds account for £1.2bn. This is a capped amount and we will determine the efficient spend and value for money in the funds during the control period.

Figure 9.2: Network Rail's breakdown of projects in England & Wales

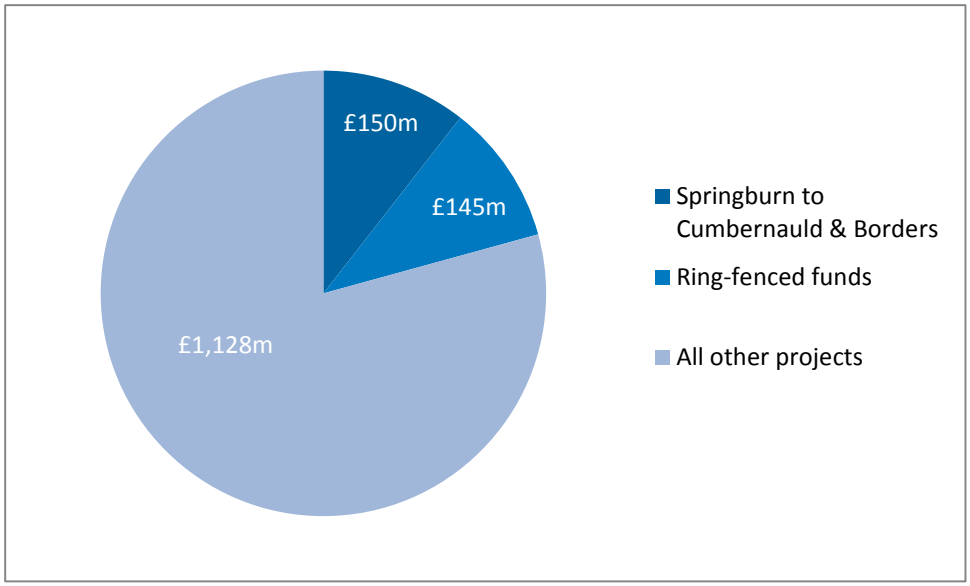


9.34 In Scotland, of the £1.4bn proposed in the SBP:

(a) we have already assessed the Springburn to Cumbernauld and Borders projects through the investment framework (combined total of £150m) and these are subject to target price arrangements with Transport Scotland with their own pain/gain share mechanisms; and

(b) the ring-fenced funds amount to £145m. This is a capped amount and we will determine efficient spend and value for money during the control period.

Figure 9.3: Network Rail's breakdown of projects in Scotland



Project scope and costs

9.35 We carried out a review of efficient project costs informed by two studies: Arup[152] provided advice on whether the projects were required to meet the England & Wales HLOS metrics; a consortium of Nichols/Turner & Townsend/URS[153] scrutinised the scope and cost estimates of about £7.2bn worth of the projects in England & Wales and Scotland.

Arup review: Check of Network Rail's HLOS capacity metrics for CP4 and CP5

9.36 Arup undertook a detailed review and validation of the model used by Network Rail to define which projects are needed to meet the HLOS requirements. This was supplemented by a cross check with Network Rail's route planners on the inputs to the modelling.

9.37 The team also checked on the level of operator involvement, either through the RUSs or subsequent industry consultation, which can indicate whether the projects that had been proposed in the SBP to deliver the capacity metrics had originated from the RUSs and therefore had good business cases with stakeholder support.

[152] http://www.rail-reg.gov.uk/pr13/publications/consultants-reports.php.

[153] http://www.rail-reg.gov.uk/pr13/publications/consultants-reports.php.

Nichols consortium review: Review of Network Rail's SBP infrastructure enhancement proposals for CP5

9.38 Thameslink and Crossrail were excluded from this work. Other elements out of scope were the ring-fenced funds and projects where our own staff were better placed because of the work we have done in CP4, these are the schemes from CP4 rolling over into CP5, EGIP and Borders.

9.39 Because Network Rail's own benchmarking was insufficient we included in the Nichols consortium's work a remit to draw out any comparisons they had in global rail, water and aviation sectors.

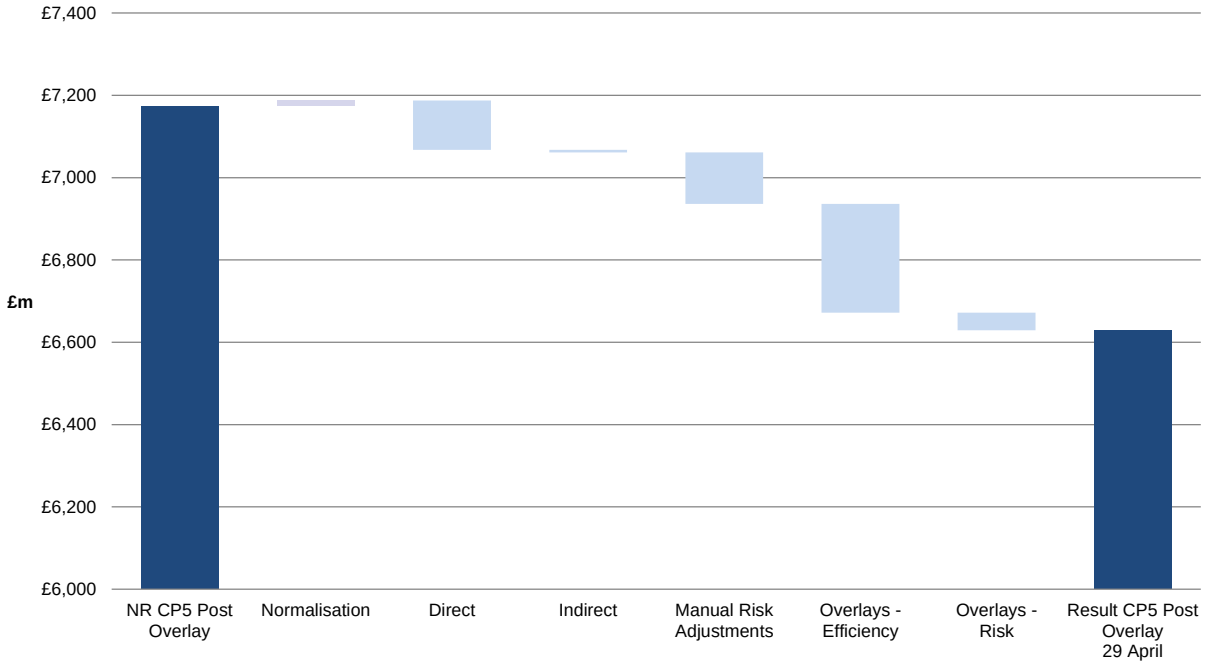
9.40 The consortium structured their review around a seven step process as shown in the figure below.

Figure 9.4: Nichols consortium review methodology

9.41 Of the projects they were able to analyse both upward and downward adjustments were made to correct any omissions and ensure estimates were in the right price base. For electrification and power supply schemes the consortium benchmarked direct costs across the CP5 projects. For indirect costs they used their own benchmarking data to check whether those proposed for each project were in line with expected norms. The consortium then looked at both the individual project risk allowances and overall risk portfolio overlay. Finally they assessed Network Rail's

efficiency proposals and applied it to a greater number of projects. Their adjustments are summarised in the following charts.

Figure 9.5: Overview of cost adjustments from Nichols consortium review



Adjustment type	(£m)	Description
Normalisation	+14	Changes in figures required to align Electric Spine project costs with the DfT forecast, adjustments resulting from reconciliation issues between the Network Rail estimates provided and their SBP submission, and changes required to harmonise the cost base to 4Q12
Direct	-120	A net reduction resulting from proposed adjustments to direct costs including their commensurate indirect and risk uplifts
Indirect	-6	A small reduction resulting from proposed adjustments to indirect costs based on comparisons with accepted norms
Manual Risk Adjustment	-125	Proposed reductions to specific project risk and contingency provisions
Overlays – Efficiency	-265	A net reduction resulting from the proposed changes to Network Rail's efficiency overlay, and to apply this to additional SBP projects
Overlays – Risk	-43	A reduction in relation to Network Rail's portfolio risk overlay, including changes to both the rate applied and the projects impacted
Total	**-545 (m)**	

9.42 We checked the Nichols consortium's work against an in-house review of a sample of projects, which was based on our own experience and analysis of CP4 projects added to the RAB through the investment framework, which is the mechanism that allows stakeholders to fund investment in between periodic reviews. Further information on the investment framework can be found on our website[154].

Frontier shift

9.43 In addition to the individual project reviews we commissioned CEPA[155] to build upon its analysis of frontier shift for other areas of expenditure and advise how this could be applied to the enhancements portfolio. They concluded a median case of 0.4% per annum savings for enhancements.

Treatment of projects at an early development stage

9.44 A further complication in determining efficient costs is the uplifted levels of risk and uncertainty inherent in projects at an early stage of development. An equally important issue for these projects is that Network Rail has not yet been able to fully engage with train operators in developing scope and selecting the best option. It is widely recognised that decisions made at an early stage of a project have the biggest influence on outturn costs. This was well illustrated in the Rail Value for Money Study[156]. It is therefore extremely important for train operators to be involved at early stages so that the best whole industry scope is developed that delivers the required operational benefits.

England & Wales

9.45 Of the £6.7bn costs that we examined there is about £6bn based on an indicative definition of scope and risks, i.e. a single option has not yet been developed. Of this broadly £1.5bn[157] is allocated for risk. So much risk provision makes determining efficient costs more difficult and weakens outperformance incentives.

9.46 In the SBP Network Rail proposed that about £2.3bn worth of these projects should be treated differently. It proposed that our final determination should include provisional estimated costs (which for some projects include a 60% uplift for

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[154] http://www.rail-reg.gov.uk/upload/pdf/investment_framework_guidelines_october_2010.pdf

[155] http://www.rail-reg.gov.uk/pr13/publications/consultants-reports.php

[156] http://www.rail-reg.gov.uk/upload/pdf/rvfm-atkins-programme-management-250511.pdf

[157] Calculated by applying the average risk allowance (25%) to £6bn.

uncertainty). Once the schemes are more developed and have cost probability distributions Network Rail will develop a portfolio cost estimate. ORR would review this and agree an efficient cost. The difference between this portfolio cost and the provisional estimate would then be adjusted for through the RAB or the opex memorandum account, as appropriate, at the start of CP6. The projects proposed for this treatment included Electric Spine, East-West Rail, Waterloo and traction power upgrades.

9.47 We asked Network Rail to explain why so many projects were at an early stage of development given that it expects to spend £91m[158] in CP4 on developing schemes for CP5. Most are schemes which DfT included in its HLOS and were based on limited development work, so the outputs are not yet sufficiently defined. In these cases we believe it is unreasonable that Network Rail should be penalised. Other projects are at an early stage of development because Network Rail thought they would not be needed for the HLOS, or the development work needed to be sequential to other CP5 projects (e.g. power supply upgrades). The targeting of development funding in future control period needs to be better than in CP4, with closer working across the industry with funders.

9.48 Even with the proposed treatment of the £2.3bn schemes there is too much uncertainty in the remaining £4.3bn; which would still contain around 20-30% risk uplift from the base estimate. The cost uncertainty also means that an efficient cost determination on a £4.3bn portfolio would be difficult because it would include around £1bn[159] of risk provision and the 'accuracy' of an efficient cost determination would be reduced.

9.49 We have, therefore, decided to treat all projects where we set an efficient cost (the £6.7bn portfolio) differently from PR08 and review costs for these later in the control period when they are more certain. This will allow:

(a) better targeting and setting of efficient costs for the bulk of CP5; and

(b) opportunities to achieve better value for money through deeper engagement of TOCs and FOCs so that we have greater certainty that the right projects are

[158] Reported in Appendix 24 of the SBP databook which updates actual and forecast expenditure for CP4 and replaces the 2013 delivery plan update.

[159] Calculated by applying an average risk allowance (25%) to £4.3bn.

scoped to achieve the best customer benefits within the framework of long-term sustainable asset policies.

9.50 Appropriate governance has to be put in place involving the TOCs and FOCs to ensure the right projects are selected and scope is sufficiently developed and ensure train operators are engaged as early as possible so that project scope is optimised for best value before the detail design and delivery stages.

Scotland

9.51 Similarly in Scotland, of the £1.1bn of costs we reviewed, around £800m[160] is based on an indicative definition of scope and risk. In its SBP Network Rail proposed that the following three schemes should be assessed at a later date in the same way as its proposal for England & Wales, due to the low level of certainty in their cost estimates:

(a) Aberdeen to Inverness Improvements Phase 1;

(b) Highland Main Line Journey Time Improvements Phase 2; and

(c) EGIP – Infrastructure works.

9.52 We think there are high levels of uncertainty in the remaining projects, for example in the phasing of the rolling programme of electrification and the proposed solution for the Edinburgh gateway station. As in England & Wales we have therefore decided to treat all projects where we set an efficient cost (the £1.1bn portfolio) differently from PR08 and review costs for these later in the control period when they are more certain.

9.53 Network Rail is developing proposals for an alliance with the next ScotRail operator, with the new franchise due to start in April 2015. This provides clear opportunities for Network Rail to make sure appropriate governance is in place to work closely together on defining the right scope for the projects. However, this should not exclude working with other TOCs and FOCs operating in Scotland.

Process for determining efficient costs in England & Wales and Scotland

9.54 We are therefore determining the efficient cost and outputs in two steps. The first concludes with our final determination, where we include in our assumptions an efficient level of costs and outputs based on our assessment of the information provided with the SBP. This incorporated the review done for us by the Nichols

[160] The sum of all projects that are GRIP 0 to GRIP 2.

consortium. We have made adjustments to ensure the funding allocation is appropriate for the stage of project development. We made an efficiency overlay that is commensurate with a portfolio that is largely at an early stage. This has been used in calculating the revenue requirement and access charges.

9.55 However, we have decided that a second step is needed which will conclude at the end of year 1 of CP5, i.e. by March 2015, at which point project development will be more advanced, and therefore the cost certainty will be higher. This will mean that we can determine more 'accurate' costs to be added to the RAB. It will also mean that the baseline for the underspend/overspend framework (RAB roll forward policy) to incentivise outperformance will be strengthened.

9.56 We expect Network Rail to have reached GRIP 3 for the majority of projects by this time (March 2015), with a much greater degree of operator involvement. During the development work, as more projects reach GRIP 3 we will monitor the emerging costs at portfolio level as well as project level. We will challenge projects, particularly where costs escalate above the assumed funding in the final determination.

9.57 Network Rail will make a submission to ORR in line with the principles of the investment framework at GRIP 3 (or agreed alternative) and we will then decide what costs should be the baseline for the underspend/overspend framework (RAB roll forward policy). The submission will demonstrate:

(a) the output is consistent with the HLOS, verified by the HLOS capacity model where necessary, and the business case is value for money;

(b) evidence of operator buy-in to the selected option (e.g. through any benefits sharing agreement);

(c) a delivery plan change control submission to set out project milestones;

(d) evidence of efficiency or stretch within the anticipated final cost; and

(e) evidence that the selected option is the best whole life cost solution.

9.58 We do not expect the aggregate costs to exceed the amount we have set in the determination, but if it does then we will discuss the implications with the funders before reaching our final decision.

9.59 As in CP4 we will then assess Network Rail's performance against the baseline for the underspend/overspend framework (RAB roll forward policy).

9.60 We believe there are opportunities through closer working with train operators to reduce unnecessary scope in the design stages and deliver construction work in a more cost-effective way. In December 2012 we published our decisions on route-level efficiency benefits sharing (REBS), which excluded enhancements as we concluded that these are more suitable for bespoke alliancing arrangements[161]. We want Network Rail and train operators to enter into commercial agreements that will reward operators if cost savings are achieved as a result of their involvement. We will consider any such payment efficient where Network Rail and train operators can demonstrate that this has happened, including how long-term value has not been compromised by short-term reward. We believe that this will help Network Rail and train operators to focus enhancements on delivering best value for money for the railway's customers. We also believe this will help Network Rail out-perform the settlement and it does not require any changes to the regulatory framework.

9.61 We will agree the detailed process with Network Rail between now and the final determination but there should be no delays to the CP5 programme. Some pilot projects have already begun.

Incentivising efficient delivery

9.62 How Network Rail is incentivised to outperform efficient project delivery is explained in chapter 12 where we explain how the underspend/overspend framework (RAB roll forward policy) will apply to enhancements in CP5.

9.63 Specifically in Scotland we have agreed with Network Rail's proposal that the other elements of EGIP should be considered as a bespoke target price arrangement (set at the beginning of the programme, with agreed pain/gain incentives). This relates to the following three projects in the SBP:

(a) electrification of Glasgow to Edinburgh via Falkirk High;

(b) Edinburgh Gateway Station; and

(c) infrastructure works.

9.64 All other enhancement projects in Scotland (except for Borders) are subject to the underspend/overspend framework (RAB roll forward policy).

[161] http://www.rail-reg.gov.uk/pr13/PDF/aligning-incentives-decisions-dec12.pdf

RAB roll forward policy

9.65 We set out earlier in this chapter a new process for determining efficient costs for some of the enhancements in England & Wales and Scotland that takes account of the early stage of development of a large number of projects submitted in the SBP. This section describes how the framework for incentivising outperformance will work.

9.66 The underspend/overspend framework for enhancements will operate as in CP4. The key difference is that the PR13 determination for enhancement costs will not be the baseline for the framework. Instead it will be set at the end of 2014-15 following our second review of the portfolio costs. It will be this expenditure level that Network Rail will be incentivised to outperform. This will also be used as the base in our assessment of Network Rail's financial performance.

9.67 Any differences between the final determination and the baseline we will treat as a change to outputs and make a financial adjustment at the end of the control period to make the re-setting of the baseline financially neutral.

9.68 The logging up of enhancements underspend and overspend will be on the following basis:

(a) it will not apply to Crossrail and Thameslink (where there are tailored protocols in place) or EGIP and Borders (where there will be target price arrangements put in place), as these projects have their own pain/gain share mechanism;

(b) it will not apply to the ring-fenced funds;

(c) for all other enhancement projects (including the Welsh Valley Lines electrification) where Network Rail underspends efficiently, i.e. it underspends whilst delivering the required outputs in full, it will retain the benefit of that outperformance for five years. We will reflect this through an adjustment of the RAB at the beginning of CP6. We will calculate the amount to be deducted as the amount of underspend less 25%. Where Network Rail has underspent due to a failure to deliver required outputs we will reduce the RAB to reflect this but it will not retain 25% of the underspend. Failure to deliver required outputs may also result in us taking enforcement action in line with our published policy.

(d) in England & Wales, we will log-up 75% of any aggregate overspend subject to any manifestly inefficient overspend being disallowed; and

(e) in Scotland, we will undertake a specific ex post efficiency assessment on the projects covered by the framework.

9.69 For the relevant projects we will apply the framework on the aggregate spend, which means Network Rail is free to budget for individual schemes as it sees fit.

Our conclusions

9.70 In this section we set out our conclusions on whether the projects meet the requirements of the HLOSs; what level of efficient cost is assumed for the revenue requirement; and what governance arrangements we want for the ring-fenced funds.

England & Wales

HLOS capacity metric requirements

9.71 The Arup review concluded that the model used was fit for purpose. The capacity interventions proposed in the SBP will accommodate the forecast peak growth in the HLOS. Despite high levels of passenger growth overcrowding at the end of CP5 will be significantly reduced in some areas (notably in Manchester and at some London terminals).

9.72 From their findings we have drawn the following conclusions:

(a) most model inputs were based on projects that originated through the RUS planning process and hence have had a high degree of consultation with industry parties, such as train operators and passenger groups, and wider stakeholders, such as local authorities;

(b) in general the RUS process identified the projects with the strongest business cases, and it is a selection of these projects which were included in the IIP, HLOS and SBP; and

(c) for each terminal station Network Rail had attempted to spread the interventions across the different routes feeding the station. This was evidenced further by meetings with the Network Rail strategic planners and a specific examination on Leeds and Manchester radial routes.

9.73 During our SBP consultation, we received many responses from stakeholders proposing schemes that they considered should be in the SBP but had been omitted. In the light of the Arup findings, we have concluded that these would deliver over and

above what is required by the HLOS capacity metrics and we have not included them in the determination.

9.74 However, these could be candidate schemes for the ring-fenced funds which will prioritise highest value for money projects.

9.75 Because we have created a new process for Network Rail to engage more fully with operators, there is plenty of opportunity for them to influence the scope of work in the planning phases and propose better value for money solutions.

Review of enhancement projects

Overview

9.76 Table 9.4 shows a breakdown of our assumed costs for projects in England & Wales. This was mainly informed by the Nichols consortium review but it also includes some other adjustments we made. The remainder of this section summarises our conclusions on each category of projects in the table.

Table 9.4: Overview of our assumptions on project costs in England & Wales

£bn (2012-13 prices)	SBP	ORR determination	Difference
Thameslink & Crossrail	3.1	3.1	0
Ring-fenced funds	1.2	1.2	0
Electrification schemes	3.2	3.0	-0.2
Other committed schemes	1.7	1.5	-0.2
Other named schemes & CP4 rollover	0.9	0.8	-0.1
HLOS capacity metric schemes	0.9	0.7	-0.2
Overlay for other adjustments	-	0.5	+0.5
Total	**11.0**	**10.8**	**-0.2**

Thameslink and Crossrail

9.77 Both of these projects will deliver significant benefits to passengers traveling across London. We have confirmed that the costs in the settlement are consistent with those agreed with DfT and Crossrail Ltd. In CP5 we will continue to operate under the protocols for these projects, where we recognise that there are specific arrangements to incentivise Network Rail.

Ring-fenced funds

9.78 We made no adjustments as the amounts were specified in the HLOSs. The final section of this chapter deals with other issues relating to these types of funds.

Electrification schemes

9.79 The Nichols consortium did a detailed assessment of the electrification schemes and costs contained within the SBP. Aside from Thameslink and Crossrail, the electrification portfolio is the largest group of projects in the SBP. It is dominated by; Great Western Main Line, Midland Main Line, North West, Transpennine and Welsh Valley Lines.

9.80 Electrifying the railway will bring many benefits for both passengers and freight users, most notably the ability to run more frequent trains with shorter journey times and less environmental impact, such as noise and diesel fumes.

9.81 There are a number of other related projects in the SBP, such as IEP, gauge clearance, power enhancement and station/platform schemes, which represents a complex picture, with a significant number of interfaces between projects.

9.82 The Electric Spine is a new programme announced by DfT, which Network Rail has identified as having uncertain scope and outputs at the time of the SBP submission. However, it does include the Midland Main Line (MML) electrification and remodelling of Derby station, both of which are further developed than the remaining programme. In its SBP, Network Rail proposed completion of the MML electrification in early CP6. In the consultation responses there was strong stakeholder challenge to accelerate this so that full electrification to Sheffield is achieved in CP5.

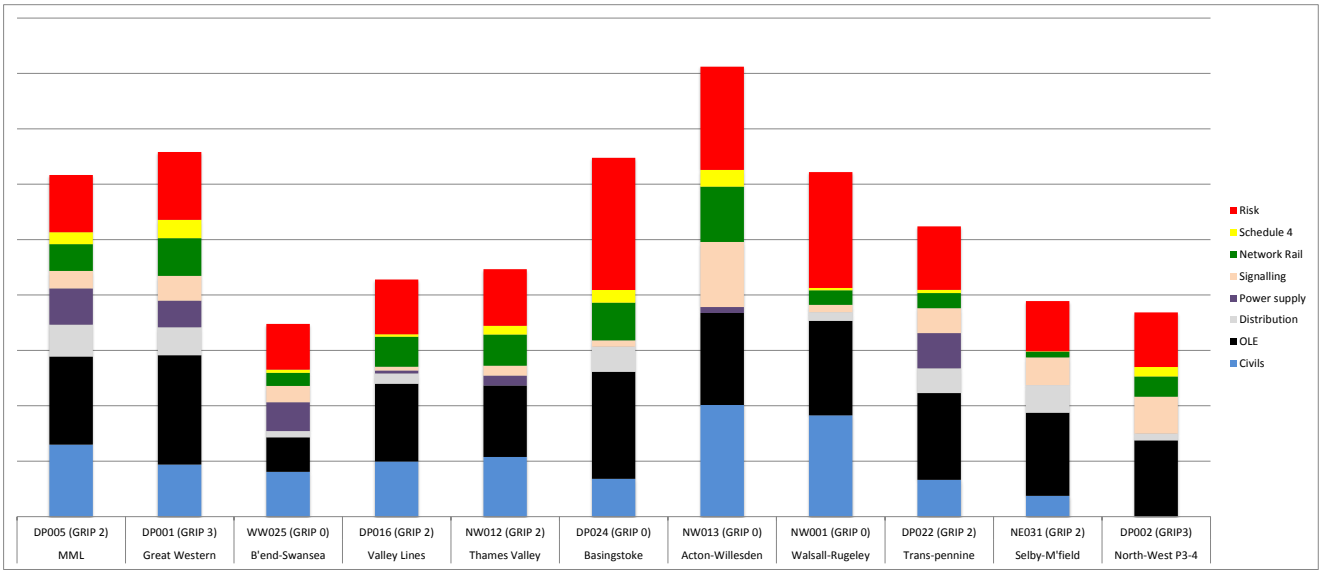
9.83 Given that the MML electrification is further developed than other elements and has very strong operator support, we expect that there is opportunity to re-prioritise the roll-out of the programme, for example by bringing electrification to Sheffield into CP5.

9.84 We have set an assumed level of funding for the Electric Spine programme – including MML electrification and Derby station. It is now for Network Rail and operators to urgently progress the design and development work of the whole portfolio to define the best value outputs in CP5 within the allocated expenditure, taking into account rolling stock availability, schedule risks and efficient delivery in the context of a large amount of other electrification work in CP5.

9.85 Given the low level of maturity of the majority of Electric Spine schemes, we have also re-profiled the spend within CP5 assuming that there will be a 2 year development and design period before implementation gathers pace. As mentioned earlier we need to make sure that infrastructure delivery is aligned with the introduction of new or cascaded trains and we will do this as we finalise the enhancements delivery plan.

9.86 The Nichols consortium produced some comparative analysis of the schemes which is summarised in the following charts.

Figure 9.6: Electrification comparisons from Nichols consortium review (the unit rates have been redacted)



Other committed schemes

9.87 The **Northern Hub** is the largest project in this category. The outputs of this project will enable more frequent train services, faster journey times and new connections across the Pennines plus additional journey opportunities to Manchester airport. The project is designed to support economic growth and has had extensive input from a range of stakeholders. Work started in CP4 and will extend into CP5 to include capacity works in the Castleford corridor, new platforms at Manchester Piccadilly and capacity improvements between Manchester, Liverpool, Rochdale, Sheffield and Chester. The Nichols consortium review found that some conservative assumptions had been made on scope and risk and that no efficiency overlay had been applied which we have adjusted accordingly.

9.88 The **Intercity Express Programme** (IEP) is a package of gauge, track and platform enhancements on the East Coast and Great Western main lines. The works will enable deployment of super express trains in CP5. The first units to be built will be introduced into service on the Great Western Main Line from 2017 and on the East Coast Main Line from 2018. The new trains will bring faster services and additional capacity to major UK cities, along the Great Western Main Line between London, Reading, Bristol, Cardiff and Swansea, and on the East Coast Main Line between London, Leeds, Newcastle and Edinburgh. The Nichols consortium's review highlighted that Network Rail had not applied its efficiency overlay or portfolio risk overlay to this project, which we did.

9.89 **East West Rail** comprises the re-opening of Bedford – Bletchley – Bicester – Oxford as a through route with a link to Aylesbury. This will open up new journey opportunities for both passengers and freight by providing direct connectivity between Oxford, Aylesbury, Milton Keynes and Bedford. This should facilitate economic growth by stimulating residential and commercial development along the route. The project has strong local stakeholder support. As with IEP, the main adjustment we made was to apply Network Rail's own portfolio and efficiency overlay, which had not been done.

Other named schemes and CP4 rollover schemes

9.90 The project to redevelop **Waterloo** is the largest project in this category. The scheme is at the pre-GRIP stage and the intention is to define and develop a scheme that will deal with long-term growth at London's busiest terminus station. Uncertainty around the outputs of this project illustrates why we have decided to revisit costs when the outputs are more fully defined. Network Rail applied its efficiency and portfolio overlays but we have removed these to bring the costs in line with the amount assumed in the SoFA. We have also re-profiled the costs to be more realistic as the project is likely to be a phased delivery throughout CP5.

9.91 **Western access to Heathrow** will create a new route from Heathrow terminal 5 onto the Great Western Main Line heading west. Network Rail and DfT have been working with aviation stakeholders and the project has strong local support. The information provided was good. But the Nichols consortium's review highlighted that the wrong cost base was used in the SBP submission and we have adjusted this accordingly. The HLOS stated that delivery of this project is anticipated to extend into CP6.

9.92 Completion of **Birmingham New Street** station is due in March 2015. The main work in CP5 is to re-construct the eastern portion of the station, including building the shopping centre above. This will enhance the passenger experience, reduce overcrowding and improve access. Progress throughout CP4 has been good, in spite of considerable difficulties, both with overcoming extra works required by structural problems with the existing building and with the continuing difficult access which has to be carefully controlled to minimise disruption to the operational parts of the station.

HLOS capacity metric schemes

9.93 This bundle contains 27 projects at a total cost of about £900m. The Arup work confirmed that these projects are required to deliver the remaining portion of the capacity metrics over and above the committed projects and named schemes. We have made some minor adjustments, including reducing the estimate for the Reading to Ascot platform lengthening to account for opportunities to reduce scope through the use of selected door opening rather than infrastructure works.

9.94 About half of the costs relate to five **traction power supply upgrade projects** in the Anglia, Sussex, Wessex, Kent and London North East routes. Whilst we have made some adjustments to these projects at this stage of the review they will be revisited in the next step that we identified earlier.

9.95 Platform extensions at eight stations on the **Uckfield Line** to allow 10 car train operation continues a series of similar projects on the Sussex route in CP4. The scheme has fewer dependencies than most platform extension schemes, given that a wider trackbed is in place for the single running line.

9.96 The scope and outputs for the **London Victoria station congestion relief** scheme should provide a much needed increase in circulating space and re-organisation of the ticket office and gatelines. The work needs to dovetail with the other master plan improvements at Victoria and also London Underground's tube station upgrade.

9.97 A key part of the **East Kent re-signalling** scheme is the construction of a new station at Rochester on land provided by the local authority. Other work consists of track and signalling improvements to get 12 car trains on the route and to reduce signalling headways between Rochester and Gillingham.

9.98 **North West train lengthening** work consists of platform extensions at up to 60 sites. Although the detailed selection and definition of project requirements is at an early

stage, this is work which is familiar to Network Rail, having completed a large number of platform extensions on the network in CP4.

9.99 Works for the **Midland Main Line capacity** project comprise platform extension and associated track and signalling works. We found some inconsistency in pricing between different locations. However, when compared to benchmark rates the direct construction costs were slightly low, whilst the indirect costs were high. We have altered the cost allocation to reflect this. The specification for the work, which is currently at GRIP 2, is based on the rolling stock in use today. Any change to this will affect the planned project outputs.

Overlay for other adjustments

Table 9.5: Breakdown of our enhancements overlay in England & Wales

£m (2012-13 prices)	ORR determination
Capitalisation of overheads	-56
Management of inflation Management of occupational health Frontier shift	-39
Property schemes and assumed investment framework schemes that are income generating	+375
Additional Schedule 4 costs	+169
Additional match funded R&D financial incentive	+45
Total	**+494**

9.100 As explained in chapter 5 Network Rail's support functions provide services to enhancements projects where the costs of these activities are capitalised rather than expensed in the year. Analysis of the SBP showed an additional capitalised cost of £62m in CP5 which did not directly link to its assumptions on support costs and Network Rail has not been able to adequately explain this inconsistency. As a result, we have deducted £62m from enhancement costs across Great Britain. We have divided this amount between England & Wales and Scotland based on current train kilometres and have therefore deducted £56m in England & Wales.

9.101 As with other areas of expenditure we have applied an overlay for cost savings that will come about by better management of inflation and better management of occupational health. This is described more fully in chapter 4. We have also applied

an overlay for frontier shift, where we have agreed with the CEPA analysis described earlier in this chapter.

9.102 Explained more fully in chapter 18 there are some projects not included in the SBP that will generate an income for Network Rail, which we have considered in Network Rail's other single till income. Therefore, we need to include an assumed cost of these projects, £416m across Great Britain. As with the capitalised cost we have divided the total between England & Wales and Scotland based on current train kilometres, resulting in an additional £375m in England & Wales.

9.103 As a result of our **recalibration of Schedules 4 and 8**, explained in chapter 20, Network Rail requested that we make an allowance of an extra £169m in its enhancements costs. We did not have time to scrutinise this before the draft determination but will do so for the final determination. We have included the extra amount in our revenue requirement calculation.

9.104 As set out in chapter 19 we are signalling our support for **research and development and innovation** as a means of improving Network Rail's productivity and reducing its costs in the medium to long-term. Subject to a well justified proposal from the company, we will introduce a matched-funding financial incentive whereby we will match each additional pound which it spends on R&D or innovation (up to a cap of £45m). This is in addition to the innovation element of the Development fund, announced in the HLOS.

European Rail Traffic Management System (ERTMS)

9.105 Costs for this project are in renewals expenditure and are not included in enhancements expenditure. However, as explained in chapter 8 we have decided to treat ERTMS train fitment costs in the same way as an enhancement ring-fenced fund.

9.106 In the SBP Network Rail sets out the industry's ERTMS implementation milestones in CP5. ERTMS is the agreed future train control and command system for the European main line network, and the national implementation plan spans some 30 years. It will be commissioned on the Great Western Main Line between London and Bristol in 2019 and on the East Coast Main Line between London and Peterborough in 2020. It is a cross-industry programme requiring coordinated

changes to lineside infrastructure, control centres, rolling stock (including passenger, freight and engineering trains) and the roll-out of new operational procedures.

9.107 The successful commissioning of ERTMS in CP5 will therefore require clarity of Network Rail's obligations so that third parties can plan their business with certainty. Network Rail will publish its key ERTMS milestones in the CP5 enhancements delivery plan, so that its obligations are clear to all parties and are subject to regulatory change control.

9.108 Within its SBP submission for renewals expenditure, Network Rail also included £206m of funding to retro-fit rolling stock to make it compatible with ERTMS train control on the above routes. Network Rail has embedded these costs into its route based signalling renewal costs and they are difficult to identify. The funding is specifically for industry to undertake first of class design and for wider fleet fitment for non-franchised fleets such as freight and open access operators. Due to different vehicle cab layouts the design will need to be bespoke for each different class of rolling stock and there are risks involved in procuring and implementing this on operational fleets that Network Rail has not included within its £206m SBP estimate.

9.109 The design and fitment work will be procured by Network Rail through negotiations with rolling stock companies and other third parties, but Network Rail will need to put governance in place to provide assurance that the costs incurred are efficient. We have decided to treat this as a ring-fenced fund, reported in the CP5 enhancements delivery plan. Although we have not made any adjustments to Network Rail's submission, our final determination will adjust these costs to allow for a reasonable level of risk. Any forecast overspend at the end of the control period will then be subject to an ex-post efficiency review.

Depots & Stabling and Ancillary Works

9.110 The level of project costs assumed in this determination provide enhanced route capability which will allow train operators to run longer and more frequent trains, and in some cases new journey opportunities. This requires either new or cascaded rolling stock for services to start running by the end of CP5. Given the current re-franchising timetable and the further project development work still required it is not yet possible to specify with any certainty what the scope of work will be for the necessary depot, stabling and rolling stock compatibility works for each route.

9.111 An estimate for these works was given to us by DfT, totalling £80m for depots and stabling for the HLOS capacity metric projects, £94m for depot and stabling works resulting from the electrification programme in CP5, and £130m for gauge, platform and electric compatibility works, totalling £312m in CP5. Given that these works are unlikely to be delivered by Network Rail but rather by the train operators or rolling stock suppliers, we have not included this in our calculation of Network Rail's revenue requirement, because this would benefit Network Rail unnecessarily.

9.112 We have, however, included an allowance of £224m[162] in our affordability assessment, to ensure that these essential works would be affordable. When there is more certainty about the scope and funding of the works and how they will be financed (for example whether through the franchise or not) the arrangements will then be finalised.

Scotland

Review of Projects

9.113 Table 9.6 shows a breakdown of our assumed costs for projects in Scotland. This was mainly informed by our own review but it also includes some other adjustments recommended by the Nichols consortium.

Table 9.6: Overview of our assumptions on project costs in Scotland

£m (2012-13 prices)	SBP	ORR determination	Difference
EGIP	489	490	+1
Borders	124	127	+3
Other Scottish projects	665	583	-82
Ring-fenced funds	145	145	0
Overlay for other adjustments	-	+62	+62
Total	1,423	1,407	-16

Edinburgh to Glasgow Improvements Programme (EGIP)

9.114 The Scotland HLOS required Network Rail to deliver EGIP, which will be subject to separate commercial arrangements. Network Rail has been developing the scope of works and delivered some infrastructure elements of the programme in CP4 through

[162] Calculated by deducting £80m which was included in the SoFA from the total amount of £312m.

the investment framework. Network Rail included a total of £489m of CP5 expenditure in the SBP for EGIP.

9.115 We approved a target price for **electrification of Springburn to Cumbernauld** through the investment framework in January 2013, with the latest forecast of CP5 expenditure at £16m. We have assumed that this is the efficient expenditure for this project rather than Network Rail's SBP proposed cost of £26m.

9.116 Network Rail has split the remaining forecast EGIP expenditure into three projects:

(a) Electrification of Glasgow to Edinburgh via Falkirk High,

(b) Construction of Edinburgh Gateway Station; and

(c) Infrastructure works including: work at Glasgow Queen Street to accommodate longer trains and improve capacity; platform extensions; signalling improvements; and works at Edinburgh Waverley station to improve capacity.

9.117 Some of the scope has been developed to GRIP 4 in CP4, such as design for electrification of the Glasgow to Edinburgh via Falkirk High line. However, Network Rail is currently awaiting clarification from Transport Scotland on the detailed requirements and timings for the overall programme. There is still uncertainty around some elements of the scope, for example works at Glasgow Queen Street and Edinburgh Waverley stations. We have assumed Network Rail's most recent estimate of £474m, as a provisional sum and we will decide the efficient cost at a later date, when Network Rail and Transport Scotland have agreed the target price arrangements.

Borders

9.118 The Scotland HLOS requires completion of this project, to reinstate the former Waverley Line between Edinburgh and Tweedbank. Although Network Rail stated that this project is at GRIP 3 in the SBP for planning purposes, the main civil works for this project recently started and the project is on schedule to complete in June 2015. We approved the funding for this project through the investment framework in October 2012, including forecast CP5 expenditure of £127m.

Other Scottish projects

9.119 Network Rail has worked with Transport Scotland to develop both **Aberdeen to Inverness Improvements (Phase 1)** and **Highland Main Line Improvements**

(Phase 2) to GRIP 3 and GRIP 2 respectively in CP4. However, the requirement and phasing for both were changed in the Scottish HLOS.

9.120 Aberdeen to Inverness Improvements (Phase 1) was developed as a programme of works with four phases, planned to be delivered across CP5 and CP6. In response to the HLOS, Network Rail has included the cost of all four phases in CP5, totalling £280m. We have applied some minor adjustments based on the conclusions of the Nichols consortium review. Transport Scotland raised concerns that Network Rail's estimate was too high as it expects this programme to be delivered over two control periods. However, the CP5 scope cannot be confirmed until timetabling work and option selection is complete. We have decided to set a cap for the CP5 expenditure to address Transport Scotland's concerns.

9.121 The SBP included £121m for Highland Main Line Journey Time Improvements Phase 2. However, this estimate is based on broad assumptions as significant timetable and scope development will need to be re-worked before the scope is confirmed. The Nichols consortium reviewed the costs and recommended there was too much uncertainty to determine the efficient cost, but identified some minor adjustments due to an incorrect price base.

9.122 The HLOS includes a **rolling programme of electrification**, covering around 100 single track kilometres per annum following completion of EGIP. Network Rail proposed five routes to be included in the programme totalling around 225 single track kilometres. Network Rail included a proposed cost of £171m for this programme. The Nichols consortium reviewed this estimate recommending that around half the scope is sufficiently defined to apply the adjusted efficiency target. We have therefore assumed an efficient cost of £168m. The SBP does not include electrification of the East Kilbride branch which has not been included in our determination. However, we recognise the industry is working up plans to deliver this through a potential alliance and funding can be addressed in between periodic reviews through the investment framework.

9.123 **Motherwell signal box re-signalling** and **Motherwell Depot stabling** improvements will support more effective operation of train services in the area, improved servicing of trains and improved track maintenance. Network Rail included CP5 cost estimates of £11m for the Motherwell re-signalling and £10m for the stabling improvements. At the time of SBP publication, it became clear that the southern end of the re-signalling

was incorrect, reducing Network Rail's estimate to £3m. We have reviewed Network Rail's estimates for these projects and determined that they are reasonable - £3m for Motherwell re-signalling and £10m for Motherwell stabling improvements.

9.124 The remodelling of **Carstairs Junction** provides an opportunity to take advantage of a CP5 renewal project in the area and significantly reduce long distance journey times. The **Edinburgh Suburban electrification** project would remove an 'island' of non-electrified railway in the Edinburgh area and provide more flexibility for freight services. The HLOS did not specify the requirement for either project and we have removed them from the determination. This does not prevent either scheme being taken forward in CP5, for example through the investment framework, should funding be identified. Indeed, in respect of Carstairs, and the benefits this will bring to Anglo-Scottish services, further discussion about the development of this scheme is underway between DfT, Transport Scotland, Network Rail and ORR.

Overlay for other adjustments

Table 9.7: Breakdown of our enhancements overlay in Scotland

£m (2012-13 prices)	ORR determination
Capitalisation of overheads	-6
Management of inflation Management of occupational health Frontier shift	-8
Property schemes that are income generating	+23
Assumed investment framework schemes that are income generating	+19
Additional Schedule 4 costs	+29
Additional match funded R&D financial incentive	+5
Total	**+62**

9.125 As explained in chapter 5 Network Rail's support functions provide services to enhancements projects where the costs of these activities are capitalised rather than expensed in the year. Analysis of the SBP showed an additional capitalised cost of £62m in CP5 which did not directly link to its assumptions on support costs and Network Rail has not been able to adequately explain this inconsistency. As a result, we have deducted £62m from enhancement costs across Great Britain. We have

divided this amount between England & Wales and Scotland based on current train kilometres and have therefore deducted £6m in Scotland.

9.126 As with other areas of expenditure we have applied an overlay for cost savings that will come about by better management of inflation and better management of occupational health. This is described more fully in chapter 4. We have also applied an overlay for frontier shift, where we have agreed with the CEPA analysis described earlier in this chapter.

9.127 Explained more fully in chapter 18 there are some projects not included in the SBP that will generate an income for Network Rail, which we have considered in Network Rail's other single till income. Therefore, we need to include an assumed cost of these projects, £416m across Great Britain. As with the capitalised cost we have divided the total between England & Wales and Scotland based on current train kilometres, resulting in an additional £42m in Scotland.

9.128 As a result of our recalibration of Schedules 4 and 8 Network Rail requested that we make an allowance of an extra £29m in its enhancements costs. We did not have time to scrutinise this before the draft determination but will do so for the final determination. We have included the extra amount in our revenue requirement calculation.

9.129 As set out in chapter 19 we are signalling our support for **research and development and innovation** as a means of improving Network Rail's productivity and reducing its costs in the medium to long-term. Subject to a well justified proposal from the company, we will introduce a matched-funding financial incentive whereby we will match each additional pound which it spends on R&D or innovation (up to a cap of £5m).

Interoperability

9.130 Interoperability is a European Commission initiative to promote a single market in the rail sector, making it easier for trains to travel across different rail networks. This is partly achieved through common specifications - the Technical Specifications for Interoperability (TSIs). Statutory requirements for interoperability are set out in The Railways (Interoperability) Regulations 2011.

9.131 The SBP included the assumption that implementing an interoperable railway would not require specific additional costs in CP5 beyond existing levels of capital

expenditure. We have decided that the assumed level of expenditure for maintenance, renewal and enhancements is sufficient to meet the requirements of the interoperability regulations and the TSIs, and therefore our determination is on this basis.

Review of ring-fenced funds

9.132 Both HLOSs made provision for ring-fenced funds. In some cases these were a continuation of a mechanism in use in CP4. Funds provide Network Rail flexibility (sometimes with rail industry partners) to specify projects to deliver outputs or strategic aims. In principle, we think these types of funds are a good idea as it gives flexibility around how certain strategic objectives should be delivered. In CP4 total expenditure on the equivalent funds is expected to be £1.4bn in England & Wales and £43m in Scotland (2012-13 prices)[163].

9.133 In England & Wales, Network Rail has proposed a further breakdown of some of the funds, in line with the HLOS. We agree with the proposed split.

9.134 Our role is:

(a) to check Network Rail's approach for each fund is likely to deliver efficient outcomes, by making sure effective governance processes are followed and that they deliver projects at efficient costs by assessing a sample of schemes;

(b) to check if progress is on target to meet Network Rail delivery plan milestones;

(c) to decide what is published and approve changes to Network Rail's delivery plan; and

(d) to resolve disputes / arising issues – e.g. accelerated funding.

9.135 We do not participate in scheme selection.

9.136 We looked at the use of CP4 funds[164]. Generally, stakeholders have been well engaged in the management of funds through working groups. However: governance arrangements have not always been sufficiently formalised; passenger groups have not always been well represented on governance or working groups (for example the

[163] Reported in Appendix 24 of the SBP databook which updates actual and forecast expenditure for CP4 and replaces the 2013 delivery plan update.

[164] http://www.rail-reg.gov.uk/pr13/PDF/sdg-efficient-enhancement-expenditure-0312.pdf and http://www.rail-reg.gov.uk/server/show/nav.2231.

performance fund uses an industry group the National Task Force for governance); in some cases management and reporting at fund-level has been weak (particularly in early stages), resulting in slippages and risk of non-delivery in CP4.

9.137 In our August 2012 outputs consultation[165], we asked for views on indicators to measure the efficiency and effectiveness of the use of the funds. The responses were generally supportive of funds. Several were keen on greater transparency of cost/programme reporting and business cases. Some supported the introduction of indicators to measure efficiency. Network Rail opposed introducing indicators as they may be too cumbersome and will not work for all funds. They also did not consider that average benefit cost ratio (BCR) is effective but rather the number of schemes completed would be a more appropriate measure. Passenger Focus stated that we need to consider passenger-centric outputs rather than just process and milestones.

9.138 In the Secretary of State's statutory guidance to ORR[166], the government stated that it expected value for money to play a key role in prioritising the use of industry-led funding pots in England & Wales.

9.139 In the Scotland, HLOS Scottish Ministers required that management of the funds reflect a number of principles, including: simplicity; evidence based; benefits to passengers and freight users; clarity on purpose and transparency on outcomes. The final arrangements in Scotland must adhere to these.

9.140 Many of the HLOS projects are focused on increasing capacity on the network at key pinchpoints, but there are also wider issues to be tackled in terms of network resilience both from a climate change and a performance point of view. To this end a Passenger Journey Improvement fund of £300m has been included in the Secretary of State's HLOS and this determination. This fund will be targeted at improving the service to passengers. It is expected that activities will be focused on three areas; journey time improvement, performance/reliability improvement and other enhancement opportunities that emerge. We are looking to Network Rail and the industry to identify where interventions are required. We expect options for adding line speed improvements to existing renewal and enhancements schemes will be

[165] http://www.rail-reg.gov.uk/pr13/consultations/outputs.php.

[166] www.gov.uk/government/uploads/system/uploads/attachment_data/file/3642/sos-guidance-to-orr.pdf.

considered, as will locations for targeted improvements (for example six of the top ten locations for reactionary ('knock on') delays are on the Brighton Main Line). The flooding at Cowley Bridge junction in 2012 is an example of problems with network resilience.

9.141 Both during and beyond CP5, there will be significant opportunities to raise line speeds and increase capacity – including the electrification of significant parts of the network, and in particular the roll out of ETCS and other new technologies for the management and operation of the network. Alongside the expected longer term impact of HS2, these changes have the potential to offer additional journey-time improvements, with potential economic and connectivity benefits. We are looking to Network Rail, working with the industry, to consider on the back of their Market Studies consultation, the scope for journey time improvements from the enhancement of long-distance routes, their social costs and benefits, and their impact on connectivity across Great Britain, comparing options make wider changes in the capability and line speeds across the network as technological changes come on stream, alongside targeted interventions to improve journey times and capacity by, for example, addressing bottlenecks. This work should report in time to inform the strategic business plan for the 2018 periodic review.

Governance arrangements

9.142 ORR expects that robust and transparent governance arrangements will be in place for CP5. These will be finalised in the enhancements delivery plan. Network Rail will consult on its draft delivery plan in December 2013. We will take any consultation responses into account before agreeing the final plan. However, the SBP supporting document 'Definition of CP5 enhancements' included a section on each of the funds which we have reviewed against the following criteria:

(a) degree of formalisation;

(b) passenger group input;

(c) reporting arrangements; and

(d) criteria for scheme selection.

9.143 Through the review we have agreed with Network Rail the following measures.

Degree of formalisation

9.144 Governance arrangements for new funds will be formalised by the existing cross industry planning oversight group on behalf of the Rail Delivery Group[167]. The Network Rail fund holder will ensure Terms of Reference (ToR) for each fund are established and that these will be consistent with the overarching governance arrangements. As it will not be practical to involve every stakeholder in all of the funds, Network Rail should set out why specific stakeholders are involved. Regional transport agencies such as TfL and the PTEs are important stakeholders and are currently included in the Rail Industry Planning Group (RIPG) [168] which was originally established by Network Rail to provide governance[169] over the RUS programme.

Passenger group representation

9.145 As in CP4 passenger groups will be involved through RIPG, which will oversee all funds. Passenger interests should be clearly reflected in the governance of the funds with issues that matter to them considered when schemes are selected. This will be done at both the overview level with passenger group involvement and at a local level with train operator involvement. Other organisations such as local authorities and local enterprise partnerships also represent passenger interests. We expect to see evidence that scheme selection meets the needs of passengers.

Reporting and transparency

9.146 A one-page template, describing each scheme being progressed through the funds, will be published on Network Rail's website. In addition, progress will be reported to the Rail Industry Planning Group and through the enhancements delivery plan.

Scheme selection

9.147 A minimum hurdle rate will be set for funds where it is appropriate, such as the NRDF element of the Passenger Journey Improvement fund. The selection criteria should be made transparent and will be set out in the enhancements delivery plan.

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[167] http://www.raildeliverygroup.org/Home.aspx.

[168] This group is currently chaired by Network Rail and involves DfT, Transport Scotland, Welsh Government, ATOC, Rail Freight Group, Rail Freight Operators Association, TfL, Centro, Passenger Focus and ORR.

[169] http://www.networkrail.co.uk/browse%20documents/rus%20documents/route%20utilisation%20strategies/network/other%20publications/rus%20governance.pdf.

9.148 In cases where a BCR is not applicable there will be alternative selection criteria which should ensure that benefits to passengers and freight users are considered. This should be made easily understandable and transparent to stakeholders.

9.149 The steering group for any fund is responsible for deciding what projects should be progressed. It is then the responsibility of the fund holder to secure the right levels of funding for a specific project, and to deliver it efficiently through the Network Rail investment authority process.

9.150 The scheme selection for Scottish funds requires that key decisions are taken that will benefit Scotland's rail users and support the policies and priorities of Scottish Minsters. Transport Scotland therefore has a specific role in the governance arrangements.

Monitoring in CP5

9.151 We want to increase transparency and incentivise efficient delivery and value for money of schemes progressed through the funds.

9.152 We will use both in-house staff and the independent reporters to complete reviews on a sample of schemes and track recommendations from previous studies on how to improve fund management and governance. In England & Wales we will check that projects are delivering minimum BCRs and where a BCR is not applicable assess whether benefits to passengers and freight users are being realised. In Scotland we will review projects against the principles specified in the HLOS. As with all of our reviews we will publish results on our website and conclusions in our Network Rail Monitor.

Passenger benefits

9.153 In addition to the passenger benefits delivered by the individual projects, identified in the earlier section, we will make sure passenger interests are reflected in the governance of the funds with issues that matter to them considered when schemes are selected.

9.154 While the outcome of enhancements do not get specifically picked up in the National Passenger Survey it is probably one of the biggest drivers of satisfaction in areas where the benefits are delivered. Therefore, we will make sure that enforceable milestones are based on the timing of the delivery of passenger and freight customer benefits, as this is what matters to them.

9.155 We will also carry out selected surveys on scheme completion to measure consumer benefits.

Freight benefits

9.156 The Strategic Freight Network has been widely supported in CP4 and is delivering infrastructure for more capacity and longer trains where it is needed. The fund will continue in CP5 in England & Wales and a new one will be created in Scotland.

9.157 In addition, there are many freight benefits accruing from other schemes. For example gauge clearance on the Midland Main Line through the electric spine combined with East-West Rail will provide potentially shorter routes because freight will be able to move from Southampton to Daventry more directly than it currently does. Another example is the remodelling of Ely North junction to provide for forecast freight flows across East Anglia as well as enhanced passenger services between Cambridge and King's Lynn or Norwich.

10. Deliverability of engineering work

Key messages in this chapter

- In determining the component parts of the CP5 package we have looked at whether outputs are achievable. We also explain whether the overall package can be delivered safely. In this chapter we set out our conclusions on whether Network Rail is capable of delivering the maintenance, renewals and enhancement work set out in this settlement.
- Network Rail is a GB wide company and whilst much of the work will be delivered by the devolved routes our assessment of programme deliverability has been done at the overall level. Our conclusions are therefore at a Great Britain wide level, but include consideration of issues specific to Scotland.
- Using expenditure as an indication of the amount of work to be done in CP5 compared with CP4, there is broadly the same aggregate level of renewals[170] and an 8% increase for enhancements[171]. Network Rail's own assessment concludes that it has a high level of confidence in successfully delivering the required work whilst still meeting its obligations on cost and performance.
- We have reviewed Network Rail's assessment, taking into account its track record and how it is planning to manage the delivery risks that it has identified so far.
- We have also commissioned our own work in specific areas of risk, such as on complex programmes like ERTMS, or work requiring significant step changes in activity, for example the electrification programme.
- In conclusion we agree with Network Rail's overall assessment. It has identified the key factors constraining delivery and has action plans in place to deal with them. There is a process in place with executive-level review to identify further risks and manage them. Given the risks remaining we have decided to regularly review Network Rail's progress against its own action plans.

[170] Comparing our assumed level of GB renewals in Table 3 of the Summary (£12,681m) with the forecast levels in Network Rail's SBP for CP4 (£12,686m) both in 2012/13 prices.

[171] Comparing our assumed level of GB enhancements in Table 3 of the Summary (£12,239m) with the forecast levels in Network Rail's SBP for CP4 (£11,294m) both in 2012/13 prices.

Key messages in this chapter (continued)

- The main uncertainty is the enhancements at an early stage of development where it is not yet possible to fully define the scope of work. We require Network Rail to update its deliverability assessment regularly as these projects become more certain and the delivery dates become clearer in the enhancements delivery plan. This is important to make sure Network Rail has assessed deliverability of the overall programme as these projects become more defined. We also require Network Rail to update its deliverability assessment when it submits its plan for spend on civil engineering renewals for years three, four and five.

Introduction

10.1 In the relevant chapters we explain our approach on a range of outputs and efficient costs that will form the CP5 package that Network Rail is funded to deliver:

(a) in chapter 11, we look at whether we think the overall package will be delivered safely;

(b) in chapter 3, we looked at outputs and explain our conclusions on each of these including judgements as to whether specific targets, such as PPM, are challenging but achievable; and

(c) in chapters 5 to 9, we looked at efficient expenditure and concluded whether efficiency targets were achievable. For example, in determining efficient operations costs we did a specific deliverability assessment of the operating strategy. And, for our assumptions on maintenance and renewals costs, we examined the volume levels.

10.2 This leaves the question as to whether the total programme of engineering work (maintenance, renewals and enhancements) can be delivered and this chapter explains our conclusions on this.

10.3 Network Rail is a GB wide company and whilst much of the work will be delivered by the devolved routes our assessment of programme deliverability has been done at the overall level. Our conclusions are therefore at a Great Britain wide level.

10.4 We have compared CP4 to CP5 by using expenditure as a proxy for the amount of work required. One of the most significant increases in renewals is within the

signalling asset, which will nearly double in volume, partly as a result of the operating strategy explained in chapter 7. As well as the work mix changing there will also be different challenges in terms of complexity, for example the operational roll-out of ERTMS on parts of the main line network.

10.5 Several industry responses to the SBP referred to the ability for Network Rail to deliver the programme with the Civil Engineering Contractors Association (CECA) mentioning pinch points in the plan around particular resources, specifically piling associated with the electrification schemes. CECA went on to comment that it believes that the large workload should offer opportunity for innovation and investment in more efficient machinery.

Framework for assessing deliverability

10.6 Assessing deliverability in the context of a periodic review does not fit neatly with any established frameworks, such as HM Treasury's tool kit for assessing a project's management case. As set out in chapter 9 the HLOSs specified a large number of projects, many of which have not yet been developed sufficiently to define and plan the scope of work. This has made it difficult to conclude in absolute terms on whether the package of work is deliverable. We have therefore reviewed Network Rail's process of assessing and managing the risks, and commissioned some specific reviews of our own to test Network Rail's conclusions.

10.7 We have had to strike a balanced view on whether Network Rail's current action plans are sufficient, given the current uncertainties and the time available to manage and reduce the risks.

Network Rail's analysis

10.8 Network Rail has developed ways of assessing deliverability under different planning horizons, i.e. short-term planning of possessions, medium term integration of projects and long-term planning to identify strategic demand/supply issues. In the SBP its deliverability analysis focused on identifying long-term risks. Its assessment collated and challenged the ten individual route plans until it had a sufficiently robust national assessment. The assessment focused on understanding what the critical factors were and identifying mitigating actions. We agree with Network Rail that it is not realistic to

expect a single integrated and resourced plan for all maintenance, renewals and enhancements work at this stage of the planning cycle.

10.9 The analysis provided with the SBP looked at the key factors influencing deliverability, their status and the actions required to increase the confidence in Network Rail's ability to deliver the plan.

10.10 The SBP included a summary of the conclusions of its assessment, with the main factors constraining deliverability being:

(a) increased access requirements compared to CP4;

(b) a shortfall in plant and logistics, particularly tilting wagons and ballast cleaners;

(c) the amount of track renewals and the ability to deliver these with less disruptive engineering closures, e.g. an adjacent line open; and

(d) the amount of electrification work, in particular requiring more supervisory, engineering and management resources.

10.11 Network Rail has action plans against each of these and has a high level of confidence that it can address them in the time available to successfully deliver the required outputs for CP5.

ORR analysis and conclusions

10.12 We have agreed with Network Rail's assessment of what it needs to do to build the capability of its own organisation and that of the supply chain so that the work volumes in CP5 are achievable. We noted the volume of work is greater than in CP4 and the portfolio is less mature than was the case at the same point in the previous control period. There is also a significant demand for electrification resources that was not required in CP4 and some notable route-based concentrations of work, such as on the Great Western Main Line.

10.13 We found that it had identified the right risks and was actively managing them, with action owners named and an executive-level review process in place.

10.14 In addition to our review of the SBP, we commissioned some specific pieces of work to look at areas of complexity and uncertainty:

(a) Halcrow reviewed Network Rail's readiness to implement the ERTMS schemes in CP5. They concluded that the likelihood of success depended on Network Rail

completing a series of important actions in 2013[172]. We will be closely monitoring Network Rail's progress against these;

(b) Nichols reviewed the programme management arrangements of the emerging portfolio of projects in the north of England, which is a CP5 deliverable. Network Rail has agreed to the recommendations and is getting on with implementing them. This increased our confidence that this programme can be delivered within CP5[173];

(c) we reviewed Network Rail's electrification resourcing strategy and attended an internal Network Rail review to build our confidence that Network Rail's actions were being put into practice. For example a key mitigating action is for Network Rail to contractually commit to framework agreements with suppliers so that they have certainty to start building capability ahead of the main implementation timescales; and

(d) as part of our CP4 work we are reviewing the deliverability of the Great Western Main Line electrification programme, which has slipped against its original project plan, but has recently completed a significant development milestone (GRIP 3) and we are more confident in the revised programme.

10.15 Under an early start mechanism we have allowed Network Rail to commence work on some enhancements projects now so there is no hiatus and Network Rail can plan ahead with the industry. This will help to mitigate risk of non-delivery in CP5.

10.16 However, there are still significant challenges for Network Rail to overcome, including:

(a) there is not currently a joined-up and integrated specification and plan covering all infrastructure, rolling stock and depot changes required for CP5. This is needed as soon as possible to give assurance that scope and outputs are aligned and optimised;

(b) there are notable concentrations in the scale of work being undertaken by Network Rail in CP5 that inevitably create deliverability risks, for example the Western route which is responsible for about 20% all projects with a total cost of over £3bn including Reading, Crossrail, IEP, several electrification schemes and

[172] http://www.rail-reg.gov.uk/server/show/nav.2231.

[173] http://www.rail-reg.gov.uk/server/show/nav.2231.

ERTMS. Network Rail's route plans and our detailed review of the electrification projects provides evidence of the focus and commitment to this major upgrade programme, but this undoubtedly represents a major challenge to efficient and timely delivery. Other examples are the East Coast Main Line and Midland Main Line that have a total of around £2bn of assumed investment;

(c) the profile of SBP expenditure shows cost falling significantly towards the end of the control period. This appears to be unrealistic for a portfolio that includes so many schemes at an early stage of development and we have made an adjustment to re-profile Waterloo and Electric Spine expenditure towards the end of the control period; and

(d) in some areas there will be demand peaks for highly specialised skills.

10.17 Considering all the above, we have concluded that the CP5 work volumes are deliverable, but this relies on a robust approach to risk management. We propose to hold regular reviews with Network Rail to provide assurance that this is happening.

11. Health and safety

Key messages in this chapter

- Network Rail has a legal obligation under the Health and Safety at Work etc. Act 1974 to maintain and, where reasonably practicable, improve health and safety and nothing in our determination should prevent Network Rail from complying with health and safety law.
- We will continue to inspect and monitor Network Rail's health and safety management and performance in CP5 and the monitor the full range of health and safety indicators, using our regulatory tools where necessary to secure legal compliance and improvements.
- We will continue to use our rail management maturity model as a benchmark for the capability of Network Rail to manage health and safety.
- We are setting one output for level crossings; Network Rail is required to deliver a package of projects in CP5, to maximise the reduction in risk of accidents at level crossings using the £67m ring-fenced fund made available by the Secretary of State.
- Scottish Ministers provided a ring-fenced fund of £10m to facilitate the closure of level crossings. This is being managed in the same way as other specific funds made available by the Scottish Government.
- We have assumed a different profile for efficiency assumptions for track maintenance (this includes off track in CP5), partly because of our concern about how quickly Network Rail can introduce its planned initiatives and new ways of working without compromising safety.
- Risks to the workforce from high voltage electricity, from being hit by trains and from working with road rail vehicles will be improved through the development and provision of new equipment.
- We expect Network Rail to implement its health and wellness strategy and to show how it is improving its management of health risks.
- We will monitor Network Rail's implementation of its long-term strategy for safety and wellbeing.

Introduction

11.1 Network Rail is required through the determination to provide a railway that is safe for passengers, the workforce and the public, provides a good service to its customers and delivers value for money for taxpayers and funders.

11.2 Health and safety has been integral in our assessment and in our determination and in this chapter we explain the health and safety context in which we have made our determination. Our determination has been informed by the current health and safety risk profile presented by Network Rail's operations and our assessment of Network Rail's ability to manage those risks.

11.3 Health and safety is a matter reserved for the UK Government and the UK Government sets out its requirements for health and safety in the HLOS prepared by the Secretary of State. Health and safety arrangements and requirements apply equally to England, Wales and Scotland.

11.4 The primary legalisation that protects passengers, the public and the workforce is the Health and Safety at Work etc. Act 1974, which requires employers to ensure so far as is reasonably practicable the health and safety of their employees and of people who use the railway[174].

11.5 We assess Network Rail's health and safety performance through our inspection and investigation work; we monitor its health and safety performance using indicators provided by the rail industry and we compare its performance with other railways.

11.6 We have a range of regulatory tools to secure improvements in health and safety standards and to secure legal compliance with health and safety law. We have a strategy for regulation of health and safety risks[175].

Our approach to health and safety in the determination

11.7 In our determination we have taken into consideration:

(a) the health and safety risks to passengers, the public and the workforce as a result of Network Rail's operations.

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[174] The term reasonably practicable has a long established history in legislation, it is a narrower term than physically possible and means that the degree of risk in a particular situation can be balanced against the time, trouble, cost and physical difficulty of taking measures to avoid the risk.

[175] See our website at: http://www.rail-reg.gov.uk/server/show/nav.1243.

(b) our assessment of Network Rail's ability to control those risks, based on evidence from our inspection findings and our assessment of Network Rail's health and safety management system using our railway maturity model; and

(c) whether the challenge to Network Rail in terms of our overall package, including the level and phasing of our efficiency challenge is consistent with Network Rail meeting its safety obligations.

11.8 To make our assessment and determination, we have reviewed the SBPs, held a specific health and safety meeting with Network Rail as part of our series of challenge meetings and sought clarification on health and safety issues at route meetings.

HLOS requirements

11.9 The Secretary of State considers the continued safe operation of the railway to be of the utmost importance and requires the industry to continue to improve its record on passenger and worker safety through the application of the "so far as reasonably practicable" approach and to ensure that current safety levels are maintained and enhanced by focusing domestic efforts on the achievement of European Common Safety Targets.

11.10 The Scottish Ministers have committed to working closely with the Secretary of State to ensure that the interests of Scotland are fully reflected.

11.11 The Secretary of State made a specific ring-fenced fund of £65m to reduce the risk of accidents at level crossings.

Network Rail's SBP submission

11.12 In its SBP submission, Network Rail made a number of commitments and proposals for health and safety in CP5, including:

(a) by 2019, *eliminating all fatalities and major injuries with a 50% reduction in train accident risk;*

(b) in the longer term, *everyone goes home safe every day;*

(c) to reduce the risk of accidents at level crossings by 8%, using the ring-fenced level crossing fund; and

(d) three investment funds for improvements, to road rail vehicles, for taking safer and faster electrical isolations and for alerting track workers to approaching

trains. These funds are mainly to improve the health and safety of the workforce, but will have efficiency benefits.

Health and safety in CP4

11.13 In the following paragraphs we briefly provide some health and safety context for the decisions we have made in our determination.

11.14 A review by the European Rail Agency for the period 2007 to 2010 found that the safety record for Great Britain's railways compares favourably with other European countries. Luxembourg performed the best for passenger and workforce fatality rates; the UK was joint-second with the Netherlands.

11.15 European legislation requires the establishment of industry wide Common Safety Targets and individual member state metrics (called National Reference Values). As of April 2012 the railway in Great Britain was broadly meeting employee and workforce targets.

11.16 The HLOS for CP4 set the Great Britain rail industry a target to reduce passenger and workforce risk by 3% by March 2014. Passenger and workforce risk is measured using RSSB's Safety Risk Model[176]. At December 2012, passenger risk had reduced by 5.6% and workforce risk had reduced by 8%.This is an 'all industry' measure and does not make clear Network Rail's performance on workforce safety.

11.17 Network Rail uses a fatalities and weighted injuries measure[177] to measure workforce safety. For the year ending March 2013, this measure was at 0.149, this is higher than the target of 0.092 and higher than March 2012 when the target was also missed.

11.18 There is little reliable workforce safety data for other European countries, but intelligence suggests that workforce fatalities and injuries are commonly caused by working on or near running lines, working at height, near high voltage electricity and

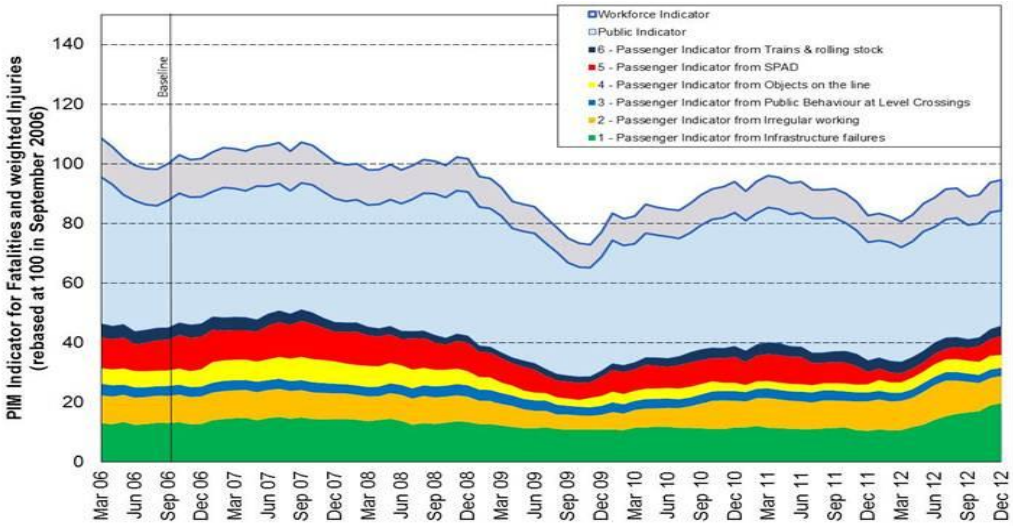
[176] The Safety Risk Model (SRM) is a quantitative representation of the potential accidents resulting from the operation and maintenance of the GB rail network. It comprises a total of 120 individual models, each representing a type of hazardous event. A hazardous event is defined as an event or an incident that has the potential to result in injuries or fatalities.

[177] Network Rail primarily measures workforce safety by the Workforce safety (fatalities and weighted injuries) measure. This measure compares the weighted number of personal injuries that are reported in their Safety Management Information System (SMIS) for all Network Rail staff and contractors working on Network Rail's managed infrastructure, normalised per million hours worked. This measure provides information to help monitor and control accidents and injuries to the workforce.

operating road rail vehicles; these are the same issues that we find on our mainline railway.

11.19 Train accidents are rare, but they are the most likely cause of serious harm to members of the public including passengers. The RSSB has developed a model to help understand the underlying risks that might result in a train accident. This is the precursor indicator model (PIM); the model controls for seasonal effects, to remove cyclic fluctuations, it quantifies changes in underlying risk and plots historical data to predict trends in the future. RSSB set a benchmark for the PIM in September 2006, to measure changes from that point.

11.20 The diagram below shows the PIM at December 2012, with an overlay to show the overall public (including passengers) and workforce indicators. The diagram shows that since the benchmark point the PIM has fluctuated but with an overall downward trend until early 2012.



11.21 Since early 2012, the risk to train passengers has now returned to about the same level as it was at the benchmark point in September 2006. Of all the measured precursors in this model, failed earthworks are now the largest single source of train accident risk to passengers because of the increase in the number of earthwork failures, due to heavy rainfall and flooding over the summer in 2012. In 2012, the incidence of structural failures was about three times the average for the preceding three years. The PIM is an industry measure, but the management of the infrastructure is the responsibility of Network Rail.

11.22 The PIM indicator for public behaviour at level crossings is at an all-time low, reflecting the work by Network Rail and the industry to manage this situation, but level crossings still present nearly half of the potential catastrophic train accident risk.

11.23 In summary, Network Rail's health and safety performance as measured by the numbers of adverse events that have happened is good compared to other European countries, but in our determination we should consider the recent increase in the risks to passengers (including the public) from the increase in infrastructure failures, the continuing risks associated with level crossings and the risks of fatalities and serious injuries to the workforce.

Our inspection work and our assessment of Network Rail's SBP

11.24 It is important to assess how well a business can control the risks it creates so that unsafe events do not happen. We assess how well Network Rail is able to identify and control risk through a programme of proactive, risk-based audit and inspection work.

11.25 Findings from our inspection work are judged against our railway management maturity model to assess Network Rail's performance against a number of components necessary for an effective safety management system. In CP4, we assess that Network Rail has improved some aspects of its management capability towards excellence but other components are some way below excellent and require improvement.

11.26 Our determination for CP5 has been informed in particular by our findings from our inspection and investigation work in the areas of infrastructure safety, workforce safety and occupational health.

Track and off track maintenance and renewals

11.27 We have inspected Network Rail's management of track, off track and civil engineering assets, because these assets have the potential to increase the risk of a train accident if they fail. Assets can fail if they are poorly maintained.

11.28 We have found insufficient resource in maintenance depots to carry out all the planned maintenance work in track and off track assets. Approximately 2,700 jobs were lost when Network Rail introduced a standard structure and resource model in its maintenance depots, to improve efficiency and reduce costs. The sizing model in

off track, drainage and some aspects of track maintenance was not properly scoped and it underestimated the actual work volumes. The lack of resource to deliver the planned maintenance volumes has been compounded by failures to fully implement new technologies such as automated track inspection systems and improve productivity through changes to working practices.

11.29 A Network Rail capability study, prompted by us found that maintenance volumes were insufficient to sustain asset condition in the longer term and recommended significant additional resource to increase volumes in track maintenance, fencing, drainage and vegetation management to begin recovering asset condition and move towards achieving maintenance volumes on exit from CP4.

11.30 This is a concern because planned maintenance addresses underlying causes of failures and a lack of planned maintenance increases the reliance on inspection and reactive maintenance to maintain a safe railway. We will continue to monitor this issue, but it is unlikely that Network Rail will meet its planned track and off track maintenance volumes in CP4.

11.31 We have served formal enforcement notices, requiring improvements to the physical condition of the assets, for example repairs to fencing; and requiring improvements to processes for maintaining a safe asset, for example management processes for proper track inspection.

11.32 In its SBP, Network Rail said that maintenance efficiencies in CP5 will come from headcount reductions, improving productivity and avoiding unnecessary work. Network Rail forecast a headcount reduction of 1,262 (8%) on the CP4 exit numbers, with a sharp reduction at the start and end of CP5. The proposed headcount reductions are not of the same order as in CP4, but in our assessment they are significant on top of the reductions already made.

11.33 Network Rail proposes to improve productivity through a number of central initiatives, described in this determination at chapter 8. These include risk-based maintenance; remote condition monitoring, changes to working practices including multi-skilling, improved information management and mechanisation.

11.34 Our assessment of the central initiatives found they are better described than similar initiatives in CP4, but their delivery is dependent on a number of other factors, for example the successful resolution of industrial relations issues and the delivery of the

refurbishment, renewal and enhancement programmes. Network Rail acknowledges many of the initiatives require a long lead time, and they will not provide sustainable efficiencies until the end of CP5.

11.35 Network Rail's Transforming Safety and Wellbeing strategy sets out a number of key enablers to support the central initiatives and to help achieve changes to working practices. Enablers include an improved safety culture, a simplified rules structure and innovation by the routes. These enablers depend on developing employee competence, capability, judgement and awareness to allow Network Rail to move to being a safer and more efficient organisation.

11.36 There is no plan linking headcount reductions in CP5 with the implementation of the central initiatives and enablers and therefore no contingency plans or go/no-go decision points in the event of central initiatives and enablers not delivering

11.37 We found a difference of opinion between some routes and Network Rail about what if any efficiency will be realised through a simplified rules structure, which is a key enabler. We engaged independent reporters to make an assessment. In their draft report, which will be published soon, they conclude it is unlikely that Network Rail will realise any significant net cost saving benefits from the simplified rules structure in CP5, but it should achieve benefits from improved compliance (safety benefits).

11.38 We found that some routes lacked an understanding of the resource required to deliver the planned off track and drainage work, even though they have agreed to achieve the maintenance and renewal efficiencies.

Conclusions – track and off track maintenance and renewals

11.39 We want to ensure that in CP5, maintenance volumes and renewals are delivered as required by Network Rail's asset policies and its SBP to provide safe track and off track assets. We are taking a number of steps to ensure that this happens. For example:

(a) in our determination, we have assumed a different profile for efficiency assumptions for track maintenance (this includes off track in CP5), giving 16.5% efficiency by the final year of CP5, compared with 13.7% assumed by Network Rail. We do not believe savings can be made beyond 16.5%, partly because of our concern about how rapidly Network Rail can introduce changes without compromising safety;

(b) we are strengthening the outputs framework and indicators for asset management and we will be monitoring Network Rail's delivery of planned asset maintenance and renewal volumes;

(c) we expect Network Rail to produce an overall maintenance strategy, either as part of its delivery plan or separately, which clarifies how the various maintenance initiatives will be optimised and integrated across the asset base. This strategy should include a change plan to show how the strategy will be delivered taking account of human factors and staff competency issues, and

(d) we will continue to audit and inspect the delivery of Network Rail's asset management systems and policies and we will use our regulatory tools to ensure safety.

Structures and earthworks

11.40 Civils structures, includes, bridges, tunnels, earthworks, embankments, cuttings and estuarine defences and their associated drainage assets.

11.41 Failures of earthworks have increased in CP4, both in overall numbers and severity, including earthwork failures at Cruachan, Loch Treig, St Bees, and Brithdir. There have been a number of occasions when trains have run into failed earthworks, including three within a 2 month period in Scotland. Nobody was seriously hurt but the potential for harm is clear. We served an improvement notice in August 2012, requiring Network Rail in Scotland to assess the risks associated with failed earthworks in adverse weather and put in place appropriate operational control measures (for example speed restrictions). We see operational control measures as an interim solution and expect the frequency and severity of earthwork failures to be reduced in CP5 through proper management of the asset. For example, through the proper provision and maintenance of drainage to cope with severe weather events. We also expect Network Rail to carry out a similar process of risk assessment and controls in other routes.

11.42 CP4 has also seen a number of structural failures including at Stewarton, Enterkin Burn Viaduct, River Crane, Bromsgrove, Old Beck and Scout Tunnel. Network Rail's knowledge of asset condition is improving, but there are still some significant gaps, for example 12,000 of the 31,000 structures do not have a current capability assessment (an assessment within the last 18 years). Our inspection work found a significant

backlog in structures examinations and we served an improvement notice requiring Network Rail to remedy this.

Conclusions – structures and earthworks

11.43 We propose to implement a new civils adjustment mechanism in CP5, chapter 8 has further details. This will allow the volume and nature of the work on civils to reflect Network Rail's improving understanding of its asset.

11.44 We will ensure that Network Rail takes account of its own risk ranking process so that civil structures assets with a high probability of failure and a very significant consequence from that failure (multiple fatalities) are prioritised in the maintenance and renewal programmes in CP5.

11.45 Both the structures and earthworks policies have been significantly revised for CP5 and we will continue to monitor how well they manage the sustainability of the asset and its resilience to adverse weather events.

11.46 The effectiveness of the new structures and earthworks policies is critically dependent on how well new practice is embedded in the devolved routes and this will be the subject of further review in 2013.

Level crossings

11.47 There are around 7,000 level crossings managed by Network Rail. The safe design, management and operation of level crossings can reduce the risks, have a positive effect on user behaviour and so reduce the number of fatal and serious incidents.

11.48 Network Rail made a commitment during CP4 to reduce the risk of accidents at level crossings by 25% through level crossing closures, renewals and upgrades. Network Rail has reported that level crossing risk reduction is currently 22.8% ahead of schedule to meet the CP4 target.

11.49 In its SBP, Network Rail proposed to reduce the risk of accidents at level crossings by 8% using the ring-fenced fund made available by the Secretary of State. Network Rail has taken a structured approach using RSSB's Safety Risk Model and knowledge of what has worked in CP4, to identify the projects that will give the maximum risk reduction in CP5. Network Rail's current plan to achieve the maximum risk reduction (8%) includes closing 30 high risk level crossings, fitting 200 red light enforcement cameras at crossings, and replacing whistle boards with train detection equipment at 300 high risk locations.

Conclusions - level crossings

11.50 Network Rail should provide us with its plan to maximise the reduction in the risk of accidents at level crossings in CP5 and using the ring-fenced fund, before March 2014. We expect the ring-fenced fund to be;

(a) used to deliver the maximum risk reduction irrespective of geographical location (England, Scotland and Wales);

(b) retained as a central fund; and

(c) used across the whole level crossing portfolio

11.51 The delivery of the planned package of projects in CP5, to achieve the maximum reduction in risk of accidents at level crossings using the £67m ring-fenced fund is a regulated output.

11.52 Scottish Ministers in their HLOS provided a ring-fenced fund to facilitate the closure of level crossings. Scottish Ministers want to ensure that level crossing closures achieve the maximum efficiency benefits, although they recognise that there will also be safety benefits. This Scottish level crossing fund will be managed in the same way as other specific funds provided by the Scottish Government, described in chapter 9.

11.53 The risk reduction achieved by using the ring-fenced level crossing fund is in addition to reducing risk so far as is reasonably practicable through, for example, routine risk assessment and the renewals and enhancements programmes.

Workforce health and safety

11.54 Our recent inspection work continues to show that improvements are required in Network Rail's management of workforce health and safety. Network Rail recognises this is the case and in its Transforming Safety and Wellbeing strategy it sets out a number of proposals including the development of the right safety leadership and culture.

11.55 In its SBP, Network Rail proposed three separate investments to improve the health and safety of the workforce. It proposes £100m to develop new ways to warn track workers of approaching trains, £141m for improvements to road rail vehicles and £230m for taking safer and faster electrical isolations.

11.56 These investments are reported here in our determination because safety improvements were cited as the reason for the investments. We consider the costs of

these investments go beyond Network Rail's obligations under the Health and Safety at Work Act etc.1974 and we have applied our section 4 duties under the Railways Act 1993 and amended by the Railways Act 2005, to decide the money that Network Rail requires for these items.

Track Worker Safety

11.57 Workers are required to work on or near lines where trains are running to carry out inspection and maintenance work. The number of worker fatalities as a result of being hit by a train is at an all-time low; one fatality occurred in 2009 and more recently there was a fatality in 2012. However, there have been some recent incidents when workers have been hit and survived and a number of near misses.

11.58 Where track workers work on lines where trains are running they rely on warning systems to give them enough time to get to a place of safety before the train arrives. This is commonly known as 'red zone' working. Some warning systems are automatic or semi-automatic, but it is still common for workers on the track to rely on warnings given by people (lookouts) using a flag or horn.

11.59 Track workers can be protected from being hit by trains because the line is blocked (by a signal) or separated or fenced from lines with trains running. This form of protection is commonly known as 'green zone' working. The amount of green zone working has increased in CP4 and now accounts for 70% of the hours worked on or near the line. Network Rail considers green zone working is now at the maximum level and likely to decrease proportionally to red zone due to increases in rail traffic.

11.60 Our inspection and investigation work in the area of track worker safety has found examples of poor planning and improper risk assessment by Network Rail managers and poor communications, behaviours and hazard perception by those carrying out the work. We have used formal enforcement action to secure improvements in red zone track patrolling and improvements in the design and operation of lookout operated warning systems.

11.61 We asked Network Rail to address the principal risks associated with red zone working in its SBP and it has done this in its Transforming Safety and Wellbeing strategy document. Network Rail has said it will prohibit red zone working with unassisted lookouts (people using flags and horns for example) in the circumstances with the greatest risks by 2015.

11.62 The planned improvements to red zone working and Network Rail's proposals in its SBP to have fewer people working on or near the track, through automated track inspections, remote condition monitoring and locating equipment away from the track, will improve track worker safety. In addition Network Rail is developing a new track-worker access strategy, an important part of this strategy is finding innovative and new technologies to alert track workers of approaching trains. Network Rail proposed an investment fund of £100m in its SBP to develop these new technologies.

Conclusions - track worker safety

11.63 We fully support and have been pressing for improvements in track worker safety, through for example fewer people being required to work on or near the line. Where work on or near the line is necessary then track workers should have the highest levels of protection, so far as is reasonably practicable.

11.64 We have not included Network Rail's proposal for an investment of £100m for alerts for track workers in our determination because Network Rail has not made a compelling case for this investment. Instead, and recognising the importance of track worker safety, our determination includes a ring-fenced fund of £10m for the development of new technologies to alert track workers. We will agree the governance arrangements for this fund with Network Rail before April 2014.

Road rail vehicles

11.65 Road rail vehicles are used extensively in maintenance, renewal and construction work, for lifting and moving materials and equipment. Most of these vehicles are converted for the railway from construction machines by attaching rail wheels, so they can be operated on the road and on rail. Many of these machines are used for tasks on the railway that they were not originally designed for, such as the conversion of excavators into lifting machines.

11.66 The road /rail excavator fleet has a particularly poor safety record; workers have been seriously injured or killed when machines have overturned because of their high centre of gravity or run away because of poor braking. These machines have also come into contact with overhead line equipment and have the potential to foul adjacent lines when trains are running. Investigation of accidents and our inspection work has found an underlying pattern of poor machine design and poor risk control. We have served over 20 enforcement notices on road rail vehicles in CP4 and the

industry has responded by making piecemeal improvements with layers of safety features and warning devices being fitted retrospectively.

11.67 In its SBP, Network Rail proposed a specific investment of £141m to improve the safety and productivity in five types of road rail vehicle;

(a) Mobile Elevated Working Platforms;

(b) Modular Lorries;

(c) Iveco Daily 4x4s;

(d) Mitsubishi Canters; and

(e) Lifting machines (Liftex).

11.68 We engaged independent reporters to review the proposals and their report will be published shortly. The draft independent reporter work divided the plant into two categories. The first category includes the four types of machine, listed as (a) to (d) above, this is conventional, commercially available equipment that is converted to allow it to perform with road/rail capability.

11.69 Network Rail proposed an investment of £70m for a new fleet of vehicles with an improved specification and configuration and to allow life-expired vehicles to be replaced.

11.70 The second category relates to excavators with both lifting and road/rail capability (known as Liftex). Network Rail proposed a fund of £75m to procure a specifically designed and manufactured fleet of machines to their own specification to replace the existing road/rail excavator fleet of machines.

11.71 We have included Network Rail's proposed investment of £141m as a provisional investment in our financial model, with the intention of reviewing this when we have the final independent reporters' report.

Conclusions – road rail vehicles

11.72 The draft independent reporter's report found there was a case for investment for the replacement of mobile elevated working platforms, modular lorries, Iveco Daily 4x4s and Mitsubishi Canters. The post efficient costs, for these machines will be set out in our final determination.

11.73 The draft independent reporter work found that Network Rail has not developed the design of the Liftex machine in sufficient detail to demonstrate its technical feasibility and meet the necessary safety and productivity challenges. However, there was clear potential to deliver productivity and safety improvements and so its development is worthwhile. We recognise the importance of this work from a safety and productivity perspective and our final determination will provide an investment fund for the design development work. As this is a development fund it will be less than the fund proposed by Network Rail of £75m.

Taking safer and faster isolations

11.74 The current methods for taking electrical isolations on both the DC and AC networks have not changed for many years. There is heavy reliance on procedures to control the risks of electrocution and electric shock, rather than by using safely designed equipment that allows isolations to be taken remotely. One worker has been killed or seriously injured every year since 1998 working on or near Network Rail's power systems.

11.75 When we investigate incidents we find confused isolation arrangements, poor understanding of what equipment is live and a lack of clarity about when isolations are required. Current electrical standards on the railway lag behind other UK industries and we have taken recent enforcement action to ensure compliance with the specific requirements of the Electricity at Work Regulations 1989. We have required Network Rail to review its isolation processes particularly at the design and build stage and some progress has been made.

11.76 In its SBP, Network Rail proposed an investment fund of £230m for taking safer and faster isolations in CP5. This proposal included, £127m for DC isolations in key locations in Wessex, Sussex and Kent (£100m of which is in CP5), £79m for improvements to the AC network in England & Wales, £11m for improvements to the AC network in Scotland and £40m for further unspecified DC improvements. Network Rail has cited safety improvements as the main reason for the investments.

Conclusions – taking safer and faster isolations

11.77 We are satisfied that Network Rail has made a positive case for investment, for taking safer and faster isolations of £190m on the AC and DC networks (£90m for the AC and £100m for the DC network). Network Rail did not provide a sufficient case for investment for the unspecified DC work at £40m and £27m of other investment on the

DC network was not in CP5. We have applied an efficiency assumption to the £190m investment, in line with our efficiency assumption for electrical power and fixed plant renewals. We assess efficient expenditure at £163m. We will monitor this expenditure to ensure that it delivers the required safety improvements.

Occupational health

11.78 Our recent inspection work found that Network Rail has no suitable coordinated approach to health management, particularly at route level. We found poor risk assessment and lack of appropriate controls on site. Network Rail acknowledges that historically occupational health issues have not been managed systematically and consequently Network Rail does not have sufficient data to provide an accurate assessment of where it is now or what it should focus on in the early part of CP5. Network Rail is in the early stages of formulating a health and wellness strategy, which will identify the key issues.

11.79 Poor management of occupational health issues has a detrimental effect on the individuals who suffer ill-health and it creates inefficiencies and costs within organisations. The HSE Labour Force Survey found that rail workers report higher incidents of ill-health, 40% higher than the all industry figure and 18% higher than construction workers. There were more appearances in GP and consultant clinics for musculoskeletal disorders and mental health complaints than would statistically be expected for the size and nature of the rail industry. RSSB estimates that occupational ill-health costs the rail industry between £109m and £163m per annum; and that 1.17m working days were lost through ill-health in 2005.

11.80 In the absence of information from Network Rail, we carried out some research, literature reviews and case studies and attempted to quantify the costs of inefficiency in occupational health, including those associated with ill-health. We considered what good practice looks like, what processes support good practice and their associated costs and estimated likely efficiency savings.

Conclusions – occupational health

11.81 In light of our research we have, currently, applied a conservative increase to our overall efficiency estimates of approximately 0.07% per annum across Network Rail's support, operations, and maintenance, renewals and enhancements costs to reflect the savings which could be achieved through improvements in occupational health.

This amounts to approximately £20m of savings in the final year of CP5. Further detail is provided in chapter 4.

11.82 We will continue to push Network Rail to formulate and implement its health and wellness strategy and we expect this to be ready for use at the start of CP5.

Network Rail's strategy for safety and wellbeing

11.83 For the first time Network Rail has set out a strategic direction for health and safety in the Transforming Safety & Wellbeing document, with the intention by 2019, of '*eliminating all fatalities and major injuries and reducing train accident risk by 50%*, and a longer term vision of '*everyone goes home safe every day'*. The strategy document was published in November 2012 and covers two control periods to 2024.

11.84 In our assessment, the strategy addresses the known health and safety risks and behavioural issues, but plans to deliver the strategy are still being developed or are in the early stages of implementation. We will discuss with Network Rail the processes it intends to use to measure, audit and review the effectiveness and success of its new strategy.

Indicators and enablers

11.85 We will continue to assess Network Rail's health and safety management performance in CP5, through our inspection and audit work and we will continue to use our rail management maturity model as a benchmark for the capability of Network Rail to manage health and safety.

11.86 We will continue to monitor Network Rail's health and safety performance by tracking the full range of information and data provided by Network Rail and the wider rail industry, including RSSB. In particular, we will monitor;

(a) Network Rail's implementation and delivery of its safety and wellbeing strategy;

(b) the current PIM or any revision of it; Network Rail is working with RSSB to make sure the PIM is robust with a specific version for Network Rail operations, so it can be used to assess and track the risks from Network Rail's activities, and

(c) that Network Rail achieves European Common Safety Targets as required by the HLOS.

11.87 Where we have any concerns about Network Rail's health and safety performance and compliance with the law we will continue to use our regulatory tools and legal powers in accordance with our health and safety enforcement policy.

12. Financial framework

Key messages in this chapter

- We have allocated to Network Rail the risks that it is best placed to manage, e.g. input price changes. This will help incentivise it to deliver continuous improvements in value for money and operate commercially where appropriate.
- The revenue that we allow Network Rail in CP5 should be sufficient for it to deliver the required outputs if it operates economically and efficiently, taking into account normal fluctuations in costs and revenues.
- In our financial framework, we have not provided funding for risks in advance of them occurring. But Network Rail's balance sheet buffer is fully available for it to use to manage risk and hence fund unexpected increases in costs. In addition, other material exceptional risks can be dealt with through the re-opener provisions.
- We will only allow Network Rail to recover our forecast of its efficient financing costs in charges, as it is not expected to issue unsupported debt in CP5. This approach, everything else being equal, significantly reduces Network Rail's revenue. This reduction in revenue could cause financial sustainability issues. So, we have increased the amortisation charge and for our draft determination we have made amortisation in CP5 equal to our forecast of renewals expenditure in CP5. This is called the adjusted WACC approach.
- Our preferred method of funding Network Rail is for all of its income to come from train operators and other customers and not through network grant. But we recognise that the governments' reporting and affordability issues mean there are advantages in Network Rail receiving a portion of funding directly from the governments. So we have decided to allow part of Network Rail's income to be provided directly by the governments through network grants, which will be set ex-ante for each year of CP5, as we did in CP4.
- In order to improve transparency we have also published in annex F what our determination of Network Rail's revenue requirement and access charges would be if we had used its cost of capital without making the adjusted WACC adjustments or using the PR08 ring-fenced approach. We also show what access charges would have been without network grants.

Introduction and context

12.1 This chapter sets out our determination of the financial framework for Network Rail in CP5. The decisions set out in this chapter are important as they can have a significant impact on Network Rail, e.g. on the level of its revenue requirement and how we treat risk. In the impacts of financial framework on financial parameters chapter (chapter 13), we set out the impact of our decisions on the financial framework on Network Rail's revenue requirement and financial costs.

12.2 It is essential that customers and funders get the best value from the money they put into the industry. To achieve this it is important that our financial framework policies deliver an appropriate allocation of risks to Network Rail (i.e. those risks that it is best placed to manage efficiently). If it manages those risks efficiently, then it can expect to earn an appropriate return.

12.3 The revenue that we allow Network Rail in CP5 should be sufficient for it to deliver the required outputs on the basis that it operates economically and efficiently, taking into account normal fluctuations in costs and revenues. However, providing Network Rail with a surplus within allowed revenues, i.e. an in-year risk buffer that is sufficient to compensate it for all possible risk, is unlikely to represent value for money as Network Rail is unlikely to be best placed to manage all risks[178].

12.4 Therefore, in this chapter we also consider how Network Rail can deal with the financial consequences of unexpected increases in costs[179] and we have decided that this can be done through the use of the balance sheet buffer[180] and re-openers[181].

12.5 Network Rail's balance sheet buffer is fully available for it to use to manage risk in all situations not just in exceptional circumstances, and hence fund unexpected

[178] When considering risk buffers, it is also necessary to consider how the underlying income and expenditure allowances have been derived, i.e. whether the assumptions are too cautious or too aggressive.

[179] These cost increases could have arisen from material events that are beyond reasonable management control or could not have reasonably been foreseen.

[180] The balance sheet buffer is the difference, at a point in time, between Network Rail's actual level of financial indebtedness and the level of financial indebtedness allowed by its network licence. In its network licence the restriction on its level of debt is presented as a percentage (i.e. debt/RAB).

[181] Re-openers are mechanisms that can be used to re-open the price control in certain situations to allow changes to be made to the revenues that Network Rail is allowed to recover, for example, where material events have happened that are beyond reasonable management control or could not have reasonably been foreseen. Hence, the financial consequences of some elements of the risks that Network Rail faces are transferred to Network Rail's funders and customers.

increases in costs. This should allow it to deliver its required outputs and will also allow Network Rail to be more innovative and to take some risks when developing ways of improving efficiency[182].

12.6 The decisions we have already taken on the financial framework are important and in particular our decision to use the adjusted WACC approach affects other parts of our financial framework, e.g. risk buffers and the restriction on the level of financial indebtedness.

12.7 This chapter covers the following issues:

(a) our approach to risk and uncertainty. This includes:

(i) inflation and input prices;

(ii) early start;

(iii) traction electricity, industry costs and rates;

(iv) risk buffers;

(v) level of financial indebtedness; and

(vi) re-openers;

(b) the adjusted WACC approach;

(c) amortisation and RAB;

(d) other financial issues:

(i) incentive strengths;

(ii) network grant;

(iii) rebates;

(iv) grant dilution;

(v) tax;

(vi) the financial ring-fence; and

(vii) outperformance.

[182] If Network Rail is using its balance sheet buffer to fund unexpected increases in costs, depending on the reason for the higher costs, we may also take enforcement action against it, e.g. if there were problems delivering an enhancement project.

Background

12.8 Network Rail's ultimate parent company is a not for dividend company limited by guarantee (CLG[183]) and has members instead of shareholders. As a CLG, Network Rail's ultimate parent company is a private organisation operating a commercial business owned by its members.

12.9 Although members are appointed largely to perform the role of shareholders in general meetings (e.g. approve/reject major transactions and vote on remuneration arrangements), there are crucial differences. In particular, members have virtually no capital at risk[184], whereas shareholders who provide equity for a business would normally take significantly more risk. The owners of Network Rail do not therefore bear the risks or realise the rewards of Network Rail's activities, and therefore the company does not pay them the dividends that shareholders would expect as a return on their risk capital.

12.10 Network Rail is solely financed by debt, therefore all of the profits left after interest has been paid on its debts are retained within Network Rail rather than being distributed to members or, if it had shareholders, as dividends[185]. As members have no material amount of capital at risk they are not directly incentivised to seek to drive the company to improve its financial performance.

12.11 In addition, Network Rail currently benefits from the FIM provided by the UK Government for the company's debt (which at 31 March 2012 was around £26bn in 2011-12 prices). So, although Network Rail raises debt like a normal company (from private sector investors who choose to put money into Network Rail rather than into other companies or investments) the debt is government guaranteed[186].

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[183] A company limited by guarantee is one not limited by shares (i.e. with no share capital), whose members undertake to contribute to the assets of the company in the event of its being wound up. This is in distinction compared to a company limited by shares whose liabilities on winding it up are limited to the amount unpaid on the company's shares.

[184] Network Rail's members have £1 of capital at risk.

[185] Network Rail has used its profits to pay a rebate to DfT and Transport Scotland, invest in the network and pay down debt.

[186] The amount of debt that can be raised under the FIM is currently capped at 90% of the RAB (90% is equal to the debt to RAB licence limit of 75% * 1.2), which is well above Network Rail's current level of gearing (62.5% at 31 March 2012). Network Rail's estimated value of the RAB at 31 March 2012 was approximately £42bn, so the FIM cap was around £39bn at 31 March 2012 (in 2011-12 prices).

12.12 As part of PR13, we have undertaken a thorough review of the financial framework for Network Rail and the incentives that this creates. In May 2012, we set out our high-level decisions on financial framework issues[187]. These decisions included our approach to the cost of capital, price control separation/disaggregation and the duration of the price control. In December 2012, we set out our decisions[188] on some of the more detailed issues relating to Network Rail's financial framework following our consultation on these issues in August 2012[189], e.g. the treatment of reactive maintenance.

12.13 Our framework is consistent with the key transformational goals we set out alongside our PR13 objective, especially aligning incentives and having a clear focus on what matters to passengers, freight customers and taxpayers – particularly improving value for money.

12.14 We have developed the financial framework for CP5 by considering all our statutory duties and using our judgement to apply an appropriate amount of weight to each of them.

12.15 We have also taken into account the views of stakeholders. In particular, we have worked closely with Network Rail, DfT and Transport Scotland to establish a financial framework for Network Rail that meets our objectives whilst also considering the requirements of others.

Approach to risk and uncertainty

Introduction

12.16 All businesses face risk and uncertainty on their costs and revenues from the impact of external events. Regulated businesses such as Network Rail are no exception. For the PR13 regulatory framework, we have decided how these risks, e.g. inflation, are allocated between the company, customers and funders.

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[187] *Setting the financial and incentive framework for Network Rail in CP5*, May 2012, available at: http://www.rail-reg.gov.uk/upload/pdf/financial-incentive-framework-cp5.pdf.

[188] This document is available at: http://www.rail-reg.gov.uk/pr13/consultations/financial-issues.php.

[189] This document is available at: http://www.rail-reg.gov.uk/pr13/consultations/financial-issues.php.

12.17 Allocating to Network Rail the risks that it is best placed to manage should ensure that it is incentivised to secure continuous improvements in value for money and operate commercially where appropriate, e.g. in managing its financial risks.

12.18 In this chapter we explain our approach to some specific risks, where some aspects of the risk may not be efficiently controllable by Network Rail, e.g. inflation and input prices and traction electricity, industry costs and rates. We then explain how risk buffers and re-openers can be used to manage risk.

Inflation and input prices

12.19 Network Rail, like other businesses and households, faces the risk that the prices it pays for goods and services, may rise or fall, i.e. inflation is a general risk faced by everyone.

12.20 The inflation that each consumer faces depends on the particular mix of goods and services it consumes. This is no different for Network Rail, as inflation can affect not only the prices it must pay for labour and materials but also the interest rates it must pay on its borrowings and the real value of its assets and liabilities.

12.21 The general level of inflation in the economy is usually measured by reference to the rate of change in the average prices of a basket of goods and services that is representative of typical consumption patterns. The most common measures of inflation are the retail prices index (RPI), and the consumer prices index (CPI).

12.22 The RPI is the index most commonly used at the moment to adjust payment flows to maintain their real value. For example, payments of interest and repayments of capital on certain government bonds (known as index-linked gilts) are indexed to RPI.

12.23 To the extent that a particular consumer faces higher or lower inflation, compared to RPI, because the average price of the basket of goods and services he or she consumes is rising or falling at a different rate compared to the RPI basket, there is a so-called relative price effect – the difference between the two reflects a change in the real cost of the goods and services consumed compared to the economy-wide average[190].

[190] This is also called input price inflation.

12.24 Each consumer can affect the particular inflation that he or she faces by the choices they make in the selection of goods and services to buy and the way in which they buy them. To this extent, the impact of inflation can be managed.

12.25 In our December 2012 financial issues decisions document, we explained that in CP5 we had decided to retain the key elements of our PR08 approach to incentivising Network Rail's management of inflation risk. Our approach reflects our view that general inflation risk is not efficiently controllable by Network Rail (although the more specific risk of input price changes is efficiently controllable by the company and is taken into account in our expenditure assessment[191]). This is consistent with conventional regulatory practice. It also reflects the view of consultees who responded to our August 2012 consultation on detailed financial issues.

12.26 We have also taken this decision because the majority (approximately 65%) of Network Rail's revenue requirement (i.e. the part relating to amortisation, allowed return and Schedule 4 & 8 payments) is not related to income and expenditure assumptions where we think there are issues with Network Rail's management of inflation risk.

12.27 Reflecting the difference between Network Rail's ability to manage general inflation risk and the more specific risks associated with changes to its input prices, we are incentivising Network Rail to efficiently manage inflation risk in CP5 using the following approach:

(a) we have included in our draft determination, ex-ante forward looking assumptions[192] for both general inflation and input price inflation for CP5[193];

(b) we have included our input price assumptions in our efficiency challenge (for CP5 this is zero for all expenditure). This means Network Rail will gain if it delivers on that challenge and lose if it does not deliver the challenge;

[191] We have decided to make no explicit adjustments to our efficiency assumptions for input price inflation, this is explained in more detail in the overview of efficient expenditure chapter (chapter 4).

[192] This means that we will forecast our view of both general and input price inflation for CP5 and not just assume that the current level of general and input price inflation continues for CP5.

[193] Including input price inflation in our efficiency assumption has a similar effect, in terms of efficiency, as adjusting our inflation assumptions for an estimate of input price inflation.

(c) we have reflected in our efficiency challenge, the findings of a study by Credo[194], our consultants, who have carried out a study to identify how efficiently Network Rail manages inflation risk[195];

(d) to be consistent with the allocation of input price risk to Network Rail, we will not adjust Network Rail's renewals expenditure for movements in a specific inflation index; and

(e) as we do not think that general inflation risk is efficiently controllable by Network Rail, we have decided not to expose Network Rail to variances in general inflation between our assumptions and the actual outturns by continuing to[196]:

(i) index allowed revenue by general inflation (i.e. RPI), which will provide stability for the industry through CP5; and

(ii) adjust Network Rail's RAB by the actual movements in general inflation (i.e. RPI) to retain the real value of its asset base (against which it raises finance).

12.28 For PR08, we used RPI as the measure of general inflation to index allowed revenue and the RAB. However, there are other general inflation measures[197] that could be used instead of RPI, for example, RPIX[198], CPI[199] and the GDP deflator[200], and we could use specific indices that include the effect of input price inflation such as IOPI or COPI[201].

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[194] We summarise the findings of the Credo inflation management study in chapter 4.

[195] The study considered total inflation risk because in practice it is difficult to separately identify general inflation risks and input inflation risk.

[196] This means that Network Rail will neither gain nor lose from the effects of general inflation.

[197] These measures of general inflation include productivity improvements in the wider economy. Therefore, when considering our efficiency and inflation assumptions (and in particular our frontier shift efficiency assumptions) we need to take this into account. Further information can be found at http://www.ons.gov.uk/ons/rel/cpi/consumer-price-indices/may-2012/stb---consumer-price-indices---may-2012.html#tab-background-notes.

[198] RPIX is RPI excluding mortgage interest payments.

[199] The Consumer Prices Index (CPI) measure the prices of goods and services purchased for the purpose of consumption by households in the UK and is similar to RPI but excludes mortgage interest payments and other costs and is calculated differently.

[200] The GDP deflator is a much broader price index than RPI, RPIX or CPI (which only measure consumer prices) as it reflects the prices of all domestically produced goods and services in the economy. Hence, the GDP deflator also includes the prices of investment goods, government services and exports, and subtracts the price of UK imports.

[201] COPI is the colloquial name for the Department for Business, Innovation and Skills (BIS) Output Price Index for New Construction: All New Construction and is derived from the relationship of current

12.29 These other measures of inflation may or may not provide a more accurate index of the effect of inflation on Network Rail. However, any assessment of the effect of inflation on Network Rail would also need to consider the effect of inflation on Network Rail's financing costs and at the moment most financial instruments are normally indexed by RPI. Approximately 50% of Network Rail's gross debt (£15bn) is index-linked[202] and the index used to adjust the value of that debt for inflation is RPI.

12.30 Materially, the biggest effect of inflation on Network Rail is the effect on its financing costs as illustrated in Table 12.1 below.

Table 12.1: Materiality of inflation on Network Rail (based on 2011-12)

In £millions	2011-12	Impact of higher inflation (e.g. 3%)	% of total expenditure
Expenditure categories			
Controllable opex	906	27	13%
Non-controllable opex	420	13	6%
Maintenance	968	29	14%
Schedule 4 & 8	172	5	2%
Renewals	2,455	74	35%
Enhancements	2,077	62	30%
Total expenditure	6,998	210	100%
Finance categories (as a percentage of expenditure)			
Financing costs	1,470	44	21%
Net debt (at 31 March 2012)	26,489	795	379%
RAB (at 31 March 2012)	42,371	1,271	605%

Note: Approximately 50% of Network Rail's debt at 31 March 2012 is index-linked and its value changes each year for inflation. The interest payments in relation to nominal debt will also include the estimate of inflation assumed when the debt was issued.

12.31 Respondents to our May 2011 document generally favoured retaining RPI for indexation of the RAB, and the use of RPI to index Network Rail's RAB would be consistent with regulatory precedent.

price and constant price construction output volume figures produced by the ONS. In other words, it represents the movement in the cost to clients of work carried out on new construction in a period.

[202] This is the level of index-linked debt at 31 March 2012. Index-linked debt is debt where the value of the debt is adjusted for movements in inflation, instead of the assumed level of inflation being included in an interest payment.

12.32 Given the above factors and in particular that financial instruments are indexed in the markets by RPI and approximately 50% of Network Rail's debt is indexed by RPI, we have decided to use RPI to index Network Rail's RAB for inflation in CP5.

12.33 The formula that we will use to index access charges will be included in our consultation on changes to access contracts and the network licence to implement PR13, which we will publish on 12 July 2013.

Early start

12.34 In PR08 we introduced a policy called 'early start', which allows Network Rail in certain circumstances to request early notification in the periodic review process about whether or not we would allow activity and expenditure to be funded through its access charges.

12.35 Therefore, the early start mechanism provides more clarity of the required outputs of the determination and the allowed revenue at an early stage of the price control process. This should mean that Network Rail does not delay investment. This is important, especially for projects with long lead times, as delays can reduce the efficiency of investment and increase costs in the supply industry.

12.36 In our May 2012 document, we decided that we would retain the current early start mechanism as it is an appropriate policy to address some of the issues of a fixed control period, e.g. to help manage the peaks and troughs of Network Rail's workload and avoid delays in investment.

12.37 The early start mechanism required Network Rail to propose in its SBP the expenditure and outputs in the first year of CP5 that it considered should qualify for the early start mechanism. In order to qualify for consideration for early start funding the investment would have to have a defined (observable/measurable) output, have clear and agreed dates for delivery, have firm cost proposals, and have funder support (if relevant).

Traction electricity, industry costs and rates

12.38 The key issue for us in determining the treatment of traction electricity costs, industry costs and rates is ensuring that, where appropriate, Network Rail is incentivised to efficiently manage these costs. These decisions were taken in the December 2012 financial issues decisions document. We set out below, how we have decided to treat

each cost category. In the traction electricity, industry costs and rates chapter (chapter 6), we set out our assumptions on these costs.

Traction electricity (£238m in 2013-14)

12.39 We have determined the efficient level of traction electricity costs and set an ex-ante allowance for each year of CP5. For those elements of the costs that we consider controllable by the company, Network Rail is on risk for the outturn being different to the ex-ante assumption. These are:

(a) transmission losses; and

(b) Network Rail's own use of traction electricity, e.g. power supplies for signals and stations.

12.40 We have decided that the elements of traction electricity costs that we deem not to be sufficiently controllable by Network Rail (i.e. all traction electricity costs except for transmission losses and Network Rail's own use of traction electricity) will be passed through to train operators. This will be implemented in CP5, through the four-weekly billing process and end of year reconciliations that the industry already uses to charge for traction electricity. This is explained further in the access charges chapter (chapter 16).

British Transport Police (£71m in 2013-14)

12.41 We have determined an efficient level for Network Rail's share of British Transport Police (BTP) costs and have set an ex-ante allowance for CP5. We consider these costs to be sufficiently controllable by Network Rail[203] and so the risk of the outturn being different from our assumptions will be borne by Network Rail. We think that this treatment is important as some of the benefits that are provided by BTP (such as reductions in delay minutes) relate to cost and performance issues that Network Rail is incentivised to deliver. BTP costs will be included in any efficiency or financial performance assessment in CP5.

RSSB costs (£9m in 2013-14)

12.42 We have determined an efficient level for Network Rail's share of RSSB costs and have set an ex-ante allowance for CP5. We consider these costs to be sufficiently

[203] Network Rail is a member of the BTPA and one of its directors is also a representative on the board of the BTPA. It is the largest funder of the BTP and can exercise industry leadership. We think that it has sufficient influence over these costs for us to treat them in the same way as support costs.

controllable by Network Rail[204] and so the risk of the outturn being different from our assumptions will be borne by Network Rail. RSSB costs will be included in any efficiency or financial performance assessment in CP5.

Licence fee and safety levy (£17m in 2013-14)

12.43 As we do not think that the licence fee and safety levy is sufficiently controllable by Network Rail, we will log-up/down any variances in these costs between the assumptions in our determination and the outturns and the variances will be included in the opex memorandum account[205]. These costs will be excluded from any efficiency or financial performance assessment in CP5.

Business (cumulo) rates (£151m in 2013-14)

12.44 We have decided to include an ex-ante forecast of business rates in Network Rail's CP5 allowed revenue. As long as Network Rail can satisfy us that it has negotiated efficiently with the Valuation Offices, we will log-up/down any variations from the level we assumed in our determination and adjust Network Rail's allowed revenues in CP6. If we determine that it has negotiated these costs efficiently, then we will exclude these costs from any efficiency or performance assessment in CP5, otherwise we will include them.

Reporters' fees (£3m in 2013-14)

12.45 We commission independent reporters[206] to provide assurance in relation to different areas of Network Rail's regulated activities, e.g. the sustainability of its asset policies and asset information quality. The volume of work that we commission will reflect the level of confidence that we have in Network Rail's information and processes. Therefore, Network Rail has significant control over these costs. However, we also have some influence over the level of work that is required and we will work with Network Rail to develop more joined-up, effective and efficient assurance processes making better joint use of reporters, Network Rail's own internal assurance and independent assurance commissioned by Network Rail.

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[204] Network Rail is a member of the RSSB, and two of its directors are also on the RSSB Board. It is the largest funder of RSSB and can exercise industry leadership. We think that it has sufficient influence over these costs for us to treat them in the same way as support costs.

[205] This is an account where monies due to Network Rail, e.g. incentive payments are held.

[206] Independent reporters are consultancy firms who provide independent expert advice and are used by us to review some aspects of Network Rail's performance, plans and activities, e.g. its financial reporting. They owe a duty of care to both ORR and Network Rail but Network Rail pays for their costs.

12.46 As a result, we are proposing that we will determine an efficient level of reporters' fees for CP5. If at the end of CP5, Network Rail can show that any material under/over spend is the result of our actions instead of being driven by an issue at Network Rail, then we will log-up/down the costs of our actions and adjust Network Rail's CP6 revenue requirement through the opex memorandum account in CP5. These costs will be included in any efficiency or financial performance assessment in CP5 but we will adjust for variances caused by our actions.

Risk buffers

12.47 In PR08, we established an 'in-year risk buffer' for Network Rail. This was the amount we thought that it needed to enable it to manage business risk and normal fluctuations in cash flow. In PR08, the in-year risk buffer was £226m for England & Wales and £28m for Scotland per annum (in 2012-13 prices).

12.48 We decided in December 2012 not to provide Network Rail with an in-year risk buffer in CP5. This is because we consider that, for a number of reasons, the benefits of an in-year risk buffer may not be achieved in practice and circumstances have changed since PR08. These reasons include:

(a) given it is not likely that Network Rail will issue unsupported debt in CP4 or CP5 and as it has the FIM, it will be able to continue to deliver our determination irrespective of whether an efficiency initiative has failed;

(b) Network Rail not planning to issue unsupported debt in CP5 will, everything else being equal, mean that we expect the consequences of Network Rail experiencing an unexpected increase in costs will be less severe than we thought in PR08. This is because as Network Rail is still using the FIM, it should still be able to access financial markets on reasonable terms. Therefore, the benefit an in-year risk buffer provides in relation to this issue is not significant for CP5;

(c) in our PR08 determination, our base case assumption was that Network Rail would perform in line with our determination and would not require the use of the in-year risk buffer. Therefore, in PR08 we assumed that the annual in-year risk buffer in CP4 would be used to reduce debt and not used to fund overspends. If we provide Network Rail with an in-year risk buffer for CP5, it is likely that we would take the same approach. Therefore, this money in practice just increases

the balance sheet buffer[207], which means that the real issue is whether the size of the balance sheet buffer is appropriate;

(d) in PR08, when we assessed Network Rail's financial sustainability, the adjusted interest cover ratio (AICR) was a very important financial indicator for us to consider. This was because of its use by credit rating agencies to assess the financial position of a company. Without an in-year risk buffer, Network Rail's AICR would have been significantly lower. This could have made it more difficult for Network Rail to issue unsupported debt in CP4. However, in CP5 we do not expect Network Rail to issue unsupported debt. Therefore, it is not necessary to provide Network Rail with an in-year risk buffer for financial sustainability reasons;

(e) providing funding for Network Rail in advance of it being needed could be perceived as being an unnecessary cost at a time of constrained funding and current overall pressures on public finances, and it could weaken incentives. This is particularly the case given that we have confirmed in our May 2012 document that we will be using the adjusted WACC approach to determine Network Rail's allowed return and that we do not expect Network Rail to issue unsupported debt in CP5; and

(f) as well as Network Rail's statutory accounts, we also require Network Rail to prepare regulatory accounts and we report on its efficiency in our annual finance and efficiency assessment. Therefore, the overspend (everything else being equal) caused by the failure of an efficiency initiative would still be included in our efficiency monitoring in our annual finance and efficiency assessment, as our reporting needs to be balanced. Therefore, the financial consequences of the failure of an efficiency initiative would still be clear.

12.49 Network Rail has expressed concerns about the potential impact on profitability of our approach to risk and the adjusted WACC approach. We will explore these concerns further with Network Rail before publication of our final determination, in order to support the company being able to manage risk in its business.

[207] The balance sheet buffer is the difference, at a point in time, between Network Rail's actual level of financial indebtedness and the level of financial indebtedness allowed by its network licence. In its network licence the restriction on its level of debt is presented as a percentage (i.e. debt/RAB).

12.50 We agree that it is important to retain the flexibility to change Network Rail's financing structure. Although at the moment there are no current plans to introduce risk capital, either through concessions or other means. If a situation arises in CP5 that requires a different approach to Network Rail's cost of capital we could deal with that situation as we discuss below.

12.51 Also, as in CP4, Network Rail has a balance sheet buffer that can be used to manage risk. We will finalise our CP5 assumptions on the level of the balance sheet buffer in our final determination. As an indication, if we assume that Network Rail's financial indebtedness limits are 72.5%[208] for each year of CP5, the balance sheet buffer would be on average during CP5 £2,440m for Great Britain, £2,092m for England & Wales and £349m for Scotland (2012-13 prices). The balance sheet buffer in this example is the difference between a debt/RAB ratio of 72.5% and our forecast of Network Rail's debt/RAB ratio in our determination for each year of CP5.

Level of financial indebtedness

12.52 The restriction on Network Rail's level of financial indebtedness has an important effect as it incentivises Network Rail to control its costs. This is because, unless we have consented otherwise, Network Rail could be in breach of its network licence if it does not use reasonable endeavours to ensure that its total financial indebtedness does not exceed the limits specified in that licence. Also, the difference between its limit on financial indebtedness and its actual debt/RAB ratio provides Network Rail with a balance sheet buffer that is fully available for it to use to manage risk and hence fund unexpected increases in costs, which should allow it to deliver its required outputs.

12.53 We decided in December 2012 to retain the licence condition which restricts the level of Network Rail's financial indebtedness, and consistent with our aim of improving the disaggregation of Network Rail's price control, we will include separate terms in Network Rail's licence for England & Wales and Scotland.

12.54 We will finalise the specific levels of Network Rail's maximum level of financial indebtedness in each year of CP5, in our final determination, as the levels need to reflect the entire PR13 package. Our current thinking based on our financial modelling is that the level of financial indebtedness in each year of CP5, should at no point

[208] This is a simple average of 70% and 75%.

exceed a limit set between 70-75% for England & Wales and Scotland. We will conclude on the level of the limits in the final determination.

12.55 We will consult on these proposed changes to Network Rail's network licence in our consultation on changes to access contracts and the network licence to implement PR13, which we will publish on 12 July 2013.

Re-openers

12.56 Re-openers are mechanisms that can be used to re-open the price control in certain situations to allow changes to be made to the revenues that Network Rail is allowed to recover through access charges, for example, where material events have happened that are beyond reasonable management control or could not have reasonably been foreseen. Hence, the financial consequences of some elements of the risks that Network Rail faces are transferred to customers and funders.

12.57 In our May 2012 document, we decided that we would continue to use re-openers as part of our approach to risk and uncertainty. An enduring settlement across the control period is very important both for the incentives that Network Rail faces and to provide certainty to the industry and its investors. So, in our view, it is likely that re-openers will only be sparingly used as they are generally intended to cover exceptional events that have a material effect on Network Rail.

12.58 We decided in December 2012 to retain two of the re-openers that we used in PR08 for PR13, although we will consult on the exact wording of these re-openers in our consultation on changes to access contracts and the network licence to implement PR13[209], which we will publish on 12 July. The two re-openers are:

(a) if there is a material change in the circumstances of Network Rail or in relevant financial markets. This re-opener applies to events in England & Wales and Scotland; and

(b) for Scotland, if Network Rail's expenditure in Scotland is forecast to be more than 15% higher than our determination for Scotland over a forward looking period of three years.

12.59 In each case we would need to determine whether the terms of the relevant re-opener

[209] These re-openers will be implemented by being included in access contracts between Network Rail and TOCs.

had been met and, if so, we would then consider whether there is a compelling case for an interim review in light of our section 4 duties.

Cost of capital

Introduction

12.60 Since PR08 there have been a number of changes that have prompted us to reconsider our approach to Network Rail's cost of capital for PR13 and in particular the approach we take to Network Rail's financing costs. These changes include:

(a) uncertainty in financial markets, which could make it harder for Network Rail to issue unsupported debt in CP5;

(b) a worse economic climate, which means that there is pressure on the governments' funding; and

(c) industry reforms. There are a number of initiatives that are currently in progress or being considered, e.g. Network Rail devolution, alliancing, concessions and REBS.

12.61 In determining our approach to funding Network Rail's cost of capital in CP5, we have considered the changes above.

Adjusted WACC approach

12.62 In our May 2012 document, we confirmed that we will use the adjusted WACC approach[210] to determine Network Rail's allowed revenue in CP5. Using the adjusted WACC approach is consistent with Network Rail not being likely to issue unsupported debt in CP5. Also, given that Network Rail is financed entirely by debt, and its debt is indemnified by the UK Government through the FIM, i.e. the UK Government takes the risk of default, the adjusted WACC approach is consistent with Network Rail's efficient financing costs being significantly lower than its cost of capital[211].

12.63 In the adjusted WACC approach we:

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[210] This approach identifies the cost of capital for Network Rail but recognises that Network Rail's debt is government backed and it does not pay dividends. Therefore, we adjust the cost of capital by deducting the equity surplus (i.e. the potential dividend payment) and on a net basis we fund our forecast of Network Rail's efficient financing costs.

[211] Network Rail pays a fee to DfT for the credit enhancement it gains from the FIM (the FIM fee). By credit enhancement, we mean that effectively Network Rail can borrow at cheaper rates than if it did not have the FIM. This is equivalent to having a higher credit rating.

(a) first, identify the cost of capital of Network Rail (reflecting all the risks that it faces before some of them are ultimately transferred to funders) and hence its full funding requirement. Therefore, the cost of capital will still be clearly visible in our determination. It will still be the basis of the cost of capital that will be used in the investment framework for calculating the financing costs of non-HLOS investment schemes as it is important that investment decisions are made using Network Rail's cost of capital. In the interests of transparency, the cost of capital will still provide the basis for a calculation of what Network Rail's charges would have been if we allowed it to recover the cost of capital rather than our forecast of its efficient financing costs (see annex F for details of the access charges on this basis);

(b) second, identify Network Rail's efficient financing costs[212] including any additional financing costs that need to be provided for financial sustainability purposes, e.g. for the difference between efficient financing costs (in real prices) and efficient financing costs that include implied inflation on nominal debt;

(c) third, recognise that Network Rail's efficient financing costs are lower than its cost of capital, due to the existence and use by Network Rail of the FIM. The difference between Network Rail's cost of capital and its efficient financing costs is called the equity surplus;

(d) then, the equity surplus is recycled before the revenue requirement is determined, i.e. the equity surplus is netted off Network Rail's bottom-line revenue requirement. We do this by including in the calculation of Network Rail's revenue requirement Network Rail's cost of capital in the calculation of the allowed return, then we deduct the equity surplus; and

(e) we then recognise that this approach, everything else being equal, significantly reduces Network Rail's revenue. This reduction in revenue could cause additional financial sustainability issues. So, we address this issue by increasing the amortisation charge, and so in this document we have made amortisation in CP5 equal to our forecast of renewals expenditure in CP5. We will decide on our approach to financial sustainability for CP5 in our final determination.

[212] Efficient financing costs are calculated on a cash basis, i.e. they exclude inflation accretion on index-linked debt. Where inflation accretion is the amount of inflation added to the value of index-linked debt to compensate debt holders for inflation.

12.64 As a general principle, we support the introduction of risk capital and unsupported debt into Network Rail because of the incentives this would bring to bear on management and through this, the behaviour of the company, making it a more 'conventional' company. We therefore want to retain the option for this to happen in CP5. The adoption of the adjusted WACC approach does not preclude the introduction of unsupported debt in later control periods as discussed below.

12.65 In order to improve transparency we have also published in annex F what our determination of Network Rail's revenue requirement and access charges would be if we had used its cost of capital without making the adjusted WACC adjustments or using the PR08 ring-fenced approach.

Other cost of capital considerations

12.66 We have reviewed the other financial framework issues in light of our decision to use the adjusted WACC approach for CP5.

Treatment of financing costs

12.67 Network Rail's financing costs in CP5 will be partly based on financial instruments that it has already taken out, i.e. part of its interest costs in CP5 are already fixed. These costs are referred to as embedded debt costs. As we have reduced the headroom available to Network Rail, e.g. we are using the adjusted WACC approach and we have removed the in-year risk buffer, we decided in December 2012 to take its embedded debt costs into account in our determination for CP5.

12.68 It is important that Network Rail efficiently manages its financing costs, so we have reviewed Network Rail's embedded debt costs as part of the periodic review process. We have included Network Rail's embedded debt costs in this determination, where we consider that these costs were incurred efficiently[213]. This should help to ensure that Network Rail faces the financial consequences of its actions in the run up to our PR13 final determination, i.e. it cannot take out debt and just assume that we will allow the costs associated with it. Our views on the efficiency of Network Rail's embedded debt costs are discussed further in the impact of financial framework on financial parameters chapter (chapter 13).

[213] Our assessment is in the round rather than an examination of every treasury instrument Network Rail has taken out.

Industry reform initiatives

12.69 We have explained above that the adoption of the adjusted WACC approach does not preclude the introduction of risk capital and unsupported debt directly into Network Rail. It should also not obstruct the development of further alliances or a concession.

12.70 In the event of future industry reforms or other significant changes, e.g. a concession, we need to decide how we would handle the effects on Network Rail's price control, e.g. we may need to turn off the equity surplus adjustment.

12.71 However, a policy of turning off the equity surplus adjustment is difficult to put in place ex-ante, as we do not know with enough clarity which industry reform initiatives could happen and how material they could be. Therefore, it would not be clear how much of the equity surplus adjustment should be turned off. There are also other financial effects of the adjusted WACC approach, such as additional amortisation, which need to be considered.

12.72 In an extreme case, where all of Network Rail's business was sold to another party that is conventionally funded by unsupported debt and equity, we would unwind the effects of the adjusted WACC approach, e.g. turn off the equity surplus adjustment. Different industry reforms, such as alliances or operating concessions, may not raise the same issues and may not therefore require an unwinding of the adjusted WACC approach.

12.73 In our August 2012 consultation, we said that we would handle these issues on a case by case basis, i.e. material changes would lead us to consider re-opening the price control, whereas immaterial changes would be logged-up to CP6. Network Rail proposed that we instead develop an automatic mechanism for adjusting the price control but did not explain how this could work. We provided further time for Network Rail to develop an automatic mechanism and in our December 2012 financial issues decisions document, we explained that we would set out, in this document, how we would handle an industry reform initiative.

12.74 Network Rail has now provided us with details of its proposal but we think that they are not adequate. For example, there are many different types of concession that could be entered into and they will have a variety of financial effects, which cannot be predicted in advance. Network Rail's proposal does not address this issue and we

think it will be difficult to develop a mechanism which accounts for every possible type of reform.

12.75 Therefore, we have decided to adopt the approach that we set out in December 2012. This means that we will consider any adjustments to the price control, which result from an industry reform initiative, on a case-by-case basis, i.e. material changes would lead us to consider re-opening the price control, whereas immaterial changes would be logged-up to CP6.

Calculation of the FIM fee

12.76 For PR13, we decided in December 2012 to calculate the FIM fee for CP5 by reference to the long-run value of the credit enhancement it provides because: this is consistent with the way that the full cost of capital is calculated; it is cost reflective; and sends the right price signals. The cost of capital study carried out by CEPA, which we discuss in more detail in the impact of financial framework on financial parameters chapter (chapter 13), has helped to inform our decision on the level of the FIM fee.

Use of the semi-annual rate for calculating allowed revenue

12.77 In calculating Network Rail's allowed revenue, we convert our full cost of capital, which is normally presented on an annual basis (i.e. 4.75% in PR08[214]), into a semi-annual rate (i.e. 4.64% in PR08) because we assume that Network Rail's cash flows are spread evenly through the year[215].

12.78 We have decided to use the semi-annual rate in the calculation of allowed revenues because a regulated utility should be able to re-invest any cash surplus that it has available during the year at its cost of capital, as that is the discount rate that is appropriate to use to assess investment opportunities and is similar to the approach used by other regulators.

Roll forward of Network Rail's debt into CP5

12.79 We have decided to maintain our PR08 policy of rolling forward the debt assumptions used in our PR08 determination for CP4 for efficient movements in debt, even though we are not assuming that Network Rail will issue unsupported debt in CP4, as we

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[214] This is on a real vanilla basis. A 'vanilla' return is based on a pre-tax cost of debt and post-tax cost of equity.

[215] Therefore, as Network Rail's cash flows are spread evenly through the year using an annual cost of capital would over compensate the company as not all the balances that the cost of capital is applied to will have been in existence for the full year.

need to maintain appropriate incentives on Network Rail to manage expenditure efficiently. We will also use this approach to roll forward our debt assumptions from CP5 to CP6.

12.80 We have reviewed Network Rail's forecasts of CP4 closing debt and consider that it is appropriate to use its forecasts as our opening balance for CP5 for our draft determination as they are consistent with the income and expenditure assumptions used elsewhere in this document. We will review these assumptions for our final determination.

Calculation of financing costs in the adjusted WACC approach

12.81 In our advice to ministers and in our August 2012 consultation we presented the calculation of Network Rail's efficient financing costs for the allowed revenue requirement including the inflation element[216] of nominal financing costs as that is a cash cost, and the adjusted WACC approach funds cash efficient financing costs, and we did not include inflation accretion[217] on index-linked debt as that is not a cash cost.

12.82 We did this because we have decided to keep the introduction of the adjusted WACC approach as simple and transparent as possible. Therefore, we have decided to:

(a) calculate real efficient financing costs on a cash basis (i.e. using the conventional regulatory approach to the calculation of allowed revenue, except that it is based on financing costs instead of a cost of capital) and adjust for financial sustainability. This is consistent with the approach to amortisation where we first calculate the amortisation assumption using our conventional approach and then we adjust for financial sustainability taking account of the adjusted WACC approach; and

(b) index the whole of the RAB by RPI (i.e. using the conventional regulatory approach to the indexation of the RAB).

Approach to financial sustainability

12.83 In our December 2012 decisions document, we explained that we would use the same set of financial indicators for PR13 as we used in PR08. However, depending

[216] The interest rate on nominal debt includes compensation for the use of the money that has been borrowed for the life of the debt, e.g. if the real interest rate was 2% and the expected inflation rate was 3%, then the nominal rate would be approximately 5%.

[217] The amount of inflation added to the value of index-linked debt to compensate debt holders for inflation.

on the circumstances, the financial indicators can have different levels of importance. For example, in PR08, the adjusted interest cover ratio (AICR) and debt/RAB ratio were the key financial indicators that we used to assess Network Rail's financial sustainability.

12.84 However, the AICR does not provide us with useful information for CP5. This is because, by definition under the adjusted WACC approach, the AICR is close to one and amortisation does not directly affect the AICR. Also, the AICR is not as important for CP5 as Network Rail is not expecting to issue unsupported debt in CP5 and one of the main reasons for focusing on the AICR for CP4 was that AICR was a key financial indicator used by the credit rating agencies.

12.85 This means that our analysis has focused on the debt/RAB financial indicator. This is because it is an important financial indicator in its own right but also because the limit on Network Rail's financial indebtedness is set with reference to the debt/RAB limit.

12.86 Table 12.2 sets out the financial indicators and their definitions.

Table 12.2: Financial indicators

Indicator	Definition
Adjusted interest cover ratio (AICR)	FFO[1] less capital expenditure to maintain the network in steady state divided by net interest[2]
FFO / Interest	FFO divided by net interest
Debt[3] /RAB (Gearing)	Net debt divided by RAB
FFO / Debt	FFO divided by net debt
RCF[4] / Debt	FFO less net interest divided by net debt

Notes:

1. Funds from operations (FFO) is defined as gross revenue requirement less opex less maintenance, less Schedules 4 & 8 costs less cash taxes paid.
2. Net interest is the total interest cost including the FIM fee, but excluding the principal accretion on index linked debt.
3. Debt is as defined in the Regulatory Accounting Guidelines[218].
4. Retained cash flow (RCF) is defined as FFO minus net interest.

12.87 As we explain above in the adjusted WACC approach, we have recognised that we need to provide additional amortisation for financial sustainability reasons. For the

[218] This document is available at http://www.rail-reg.gov.uk/upload/pdf/regulatory-accounting-guidelines-2012.pdf.

purposes of this document, we have assumed total amortisation in CP5 is equal to our forecast of renewals in CP5.

12.88 We have tested the sensitivity of the financial indicators to changes in our regulatory assumptions and used Monte Carlo analysis[219] to help identify the robustness of Network Rail's financial position in the face of cost and revenue uncertainty and hence our approach to financial sustainability.

Amortisation and RAB

Amortisation

12.89 Amortisation is the remuneration of past investment that has been previously added to the RAB. It forms a major part of Network Rail's revenue requirement as Network Rail is a capex intensive business[220].

12.90 As we confirmed in our advice to ministers, our high-level approach to amortisation in CP5 is that it will be based on long-run efficient annual average capital expenditure required to maintain the network in steady state (i.e. average long-run steady state renewals) subject to financial sustainability considerations. This means that the total allowance for amortisation in any year should be broadly equivalent to the long-run efficient annual average investment expenditure that is required in order to maintain the overall capability, age, condition, and serviceability of the network in steady state (i.e. the network would be neither getting better or worse if that level of capital expenditure is sustained over the long-run).

12.91 Our calculation of long-run steady state renewals is described in the asset management: maintenance and renewals expenditure chapter (chapter 8). The two main issues that affect the calculation (in addition to the underlying level of renewals) are that we have decided to:

(a) use the 35 year period from 2014-15 as the period for our assessment of Network Rail's long-run efficient annual average capital expenditure; and

[219] Monte Carlo analysis is a technique used to analyse complex issues by simulating the various outcomes a large number of times.

[220] Amortisation is an accounting term that is equivalent to depreciation. In our context it relates to the RAB: whilst our RAB policy is now based on only adding actual capital expenditure to the RAB, the initial RAB was based on a value of the infrastructure assets and there were various non-physical asset based additions to the RAB prior to the current policy starting in CP4.

(b) take account of the scope for future efficiency improvement after CP5 (the control period we are assessing in PR13) in our calculation of long-run efficient annual average capital expenditure and we have included an estimate of frontier shift over our thirty-five year assessment period in our calculation of the efficiency adjustment. This is because both current and future, customers and funders, should be sharing the cost burden of Network Rail's inefficiency.

12.92 In addition, as we decided in PR08, we will be amortising the non-capex RAB (around £4bn in 2012-13 prices) on a straight-line basis over thirty years.

12.93 In our May 2012 document, we confirmed that we would use the adjusted WACC approach to calculate Network Rail's allowed return. In order to address the financial sustainability issues that the adjusted WACC approach may cause, we also said that we would increase amortisation. For the purposes of this document, after considering the effect of the adjusted WACC approach on all aspects of our determination, we have assumed that for our determination, total amortisation should be equal to our forecast of Network Rail's renewals spend in CP5 and the resulting financial indicators are at a level that is not financially unsustainable. This is the same approach as we used in our advice to ministers and we will update our views on financial sustainability when we make our final determination.

RAB roll forward

Introduction and context

12.94 The RAB is a key building block in our methodology for determining access charges as it forms the basis for calculating the level of allowed return and impacts on the allowance for amortisation within Network Rail's revenue requirement. This is because the RAB is reduced by the total amortisation charge[221] including a financial sustainability adjustment if necessary (although average long-run steady state renewals are calculated independently of the RAB). Also, the non-capex part of the RAB is amortised over a period of 30 years[222]. The RAB also acts as a store of value that is released to Network Rail over time through the amortisation charge.

[221] Total amortisation is equal to average long-run steady state renewals plus the amortisation of the non-capex part of the RAB plus any financial sustainability adjustment.

[222] The non-capex part of the RAB consists of RAB additions in relation to revenue re-profiling, which was a one-off adjustment reflecting an issue with government finances following ACR2003, and incentive payments relating to the company's performance in respect of the volume and asset

12.95 This section of the chapter outlines our approach to the roll forward of the RAB in CP4 and CP5 and covers the following issues:

(a) high-level principles;

(b) consultation issues

(c) overall approach to the RAB roll forward in CP5;

(d) process for rolling forward the RAB in CP5;

(e) main features of our RAB roll forward policy in CP5;

(f) civils adjustment mechanism;

(g) enhancements mechanism for early GRIP projects;

(h) projects with specific protocols; and

(i) investment framework/spend to save.

High-level principles

12.96 In our 2003 access charges review (ACR2003), we established a set of high-level principles for valuing the RAB which were also used in PR08. These principles are:

(a) transparency: we will publish our assumptions and calculations in full. Network Rail's current and future lenders will have a clear and transparent basis on which to value the company. Looking ahead to the future, this should assist Network Rail if it raises additional debt without a government guarantee;

(b) consistency: our methodology must be consistent with the policy statements made previously. This is because predictability and consistency over time in our approach serves to improve confidence in the regulatory regime and will enhance Network Rail's ability to finance its business in future; and

(c) simplicity: we will strive, where possible, to ensure that the calculation of the RAB remains as straightforward as possible.

12.97 In December 2012, we decided to retain these principles for CP5.

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stewardship incentives in CP3. The non-capex part of the RAB does not include all non-capex expenditure that has been added to the RAB, e.g. the expenditure in relation to the Hatfield derailment in 2000 is not included in the non-capex part of the RAB as we only started treating non-capex expenditure in this way in CP3.

Consultation issues

12.98 In our August 2012 consultation, we set out the key features of the RAB roll forward policy in CP4. We also explained that because we are keeping the current operating expenditure and capital expenditure incentive strengths for CP5 the same as in CP4, we intended to retain the same overall approach to the RAB roll forward in CP5 as it has appropriate incentive properties. We did, however, set out some areas where our RAB roll forward approach could be improved for CP5. These areas include:

(a) not indexing our renewals assumptions for changes in input prices[223];

(b) being consistent, where possible, between the treatment of renewals and enhancements to minimise any perverse incentives for Network Rail to favour one form of expenditure over the other;

(c) treating an overspend on enhancements in England & Wales in the same way as in Scotland (although we need to take account of the two price controls being separate);

(d) considering where our policies should distinguish between volume and unit cost based variances and how net underspend/overspends should be treated;

(e) whether to set out in our PR13 determination our criteria for determining when a failure to deliver outputs or maintain the serviceability and sustainability of the network, would require a RAB adjustment and possibly an adjustment to efficiency;

(f) considering whether it would be useful to set out in our PR13 determination, guidance on how we would adjust for a failure to deliver outputs or maintain the serviceability and sustainability of the network in the short, medium and long-term;

(g) whether we should treat all renewals underspends in the same way, given the difficulty we have in confirming that some types of renewals underspends are efficient, e.g. volume related underspends; and

(h) considering how the lack of clarity (due to a significant part of Network Rail's network being composed of long life assets) over the links between inputs,

[223] In PR08 we included a RAB adjustment to renewals expenditure for movements in input prices. The adjustment was based on movements in the infrastructure output price index (IOPI).

outputs and the serviceability and sustainability of the network in the short, medium or long-term could affect our RAB roll forward policy.

12.99 In our December 2012 financial issues decisions document, we decided not to index our renewals assumptions for changes in input prices, in order to be consistent with our decision to allocate input price risk to Network Rail[224]. This will improve the incentives on Network Rail to manage inflation risk related to its costs by including an upfront estimate of input price inflation in our efficiency assumptions in CP5 (for CP5 this is zero for all expenditure).

12.100 Apart from our treatment of input prices, we did not decide on the other issues as we wanted to discuss them further with Network Rail. We have now had those discussions and set out our decisions below:

(a) in PR08 there are differences in the RAB roll forward treatment of volume and unit cost variances in renewals expenditure. We have decided that as it is the aggregate variance that is more important these variances should be treated equally to simplify the RAB roll forward policy, which should make the incentives on Network Rail more effective. The most appropriate way of implementing this change is use the approach for enhancements in England & Wales for renewals in England & Wales and Scotland, i.e. overspend relating to additional volumes of work or unit costs for renewals in England & Wales and Scotland will be added to the RAB, unless the overspend is manifestly inefficient. This provides sufficient incentives against inefficient spend and is more practical than the complicated efficiency test we used for renewals in England & Wales and Scotland in CP4. It would also maintain a consistent approach to renewals in England & Wales and Scotland;

(b) we have decided that where possible, the RAB roll forward policy should not distinguish between renewals and enhancements expenditure to minimise any perverse incentives for Network Rail to favour one form of expenditure over the other, and to simplify the policy. In PR08, our enhancements expenditure assumptions for CP4 included contingency. For CP5, our enhancement expenditure assumptions do not include contingency, therefore we no longer

[224] Therefore, to be clear we have decided that we will not adjust Network Rail's renewals additions to the RAB in CP5 for movements in IOPI (or another specific inflation index).

need the £50m per annum deadband for enhancement overspend in England & Wales that we used in CP4, as Network Rail has not already been funded for that amount[225].

(c) in PR08 there are differences between the RAB roll forward treatment of enhancements expenditure in England & Wales and for the treatment of enhancements expenditure in Scotland. There are advantages in having a consistent approach in England & Wales and in Scotland. However, as the two price controls are separate we have decided to retain the current differences in our approach between England & Wales and Scotland, i.e. in Scotland we will undertake a specific ex-post efficiency assessment;

(d) as in PR08 the burden of proof will be on Network Rail to show that it has met its required outputs. Where Network Rail has been funded to deliver an output that has not been delivered this will require a RAB adjustment. Due to the wide range of circumstances that can lead to Network Rail not delivering required outputs or maintaining the serviceability and sustainability of the network we do not think that is practicable for us to set out detailed prescriptive criteria for determining when and by how much a non-delivery of outputs would require a RAB adjustment. However, as our PR13 output specifications are more granular than those in PR08 we consider that it should be clearer whether Network Rail is meeting its requirements, e.g. using the new asset management indicators. We will decide in our RAGs in December 2013 whether we will provide more guidance on how an output adjustment should be calculated[226]. In particular, we will work with Network Rail to see if we can determine a methodology for calculating an adjustment for the non-delivery of performance outputs in CP5 (e.g. PPM) that can be included in the RAGs; and

[225] For the early stage GRIP schemes, our initial estimates in this document include contingency but when we assess these schemes through the early GRIP projects enhancement mechanism, we will not allow contingency.

[226] For example, on how Network Rail should adjust for circumstances similar to its failure to deliver PPM and CaSL targets in 2011-12 which resulted in a £172m (in 2011-12 prices) adjustment to our assessment of Network Rail's financial performance.

(e) before we allow Network Rail to retain the benefit of an efficient underspend, consistent with our approach for assessing financial performance, we are proposing to require Network Rail to[227]:

(i) have successfully implemented a package of improvements on asset management, e.g. capability, asset policies, asset register, data quality, condition reporting and unit cost information;

(ii) achieve a minimum confidence grade on its efficiency reporting, e.g. track volumes and unit costs;

(iii) justify its efficiencies by identifying the positive management actions that generated the efficiencies; and

(iv) explain how its expenditure is consistent with the delivery of its required outputs (including safety), is sustainable in the short, medium and long-term and is consistent with whole-life cost minimisation.

12.101 We would welcome comments on the above proposal.

12.102 This means that the main differences between our RAB roll forward policy in CP5 compared to CP4 will be:

(a) we will not adjust our renewals assumptions for movements in the IOPI index;

(b) overspend relating to additional volumes of work or unit costs for renewals in England & Wales and Scotland will be added to the RAB, unless the overspend is manifestly inefficient. This is instead of having a complicated efficiency test;

(c) there will be no enhancement deadband;

(d) before we allow Network Rail to retain the benefit of an efficient underspend, it will need to show that it has successfully implemented a package of improvements on asset management and improved its reporting systems and processes as described above; and

[227] We have started to discuss with Network Rail how this will work in practice, e.g. what the minimum confidence grade on its efficiency reporting should be and we will continue these discussions in the summer.

(e) as we are using the adjusted WACC approach to Network Rail's cost of capital there is no ring-fenced fund in CP5, there will be no adjustment for the element of renewals and enhancements that are funded by a ring-fenced fund.

RAB roll forward in CP5 – overall approach

12.103 We have decided to retain for CP5, the high level principles for valuing the RAB that we established in our ACR2003 and also used in PR08, as they provide a suitable basis for our RAB roll forward policy. We have decided to largely keep the overall approach to the RAB roll forward the same as in PR08 and our detailed approach will be set out in our updated RAGs for CP5, which will be published in December 2013. This is because we are keeping the current operating expenditure and capital expenditure incentive strengths for CP5.

12.104 As we do not think that general inflation risk is efficiently controllable by Network Rail, we have decided to adjust Network Rail's RAB by the actual movements in general inflation. Otherwise the real value of Network Rail's asset base (against which it raises finance) could be eroded, which could ultimately reduce the company's ability to access financial markets and finance the renewal and enhancement of the network. This approach means that Network Rail will neither gain nor lose from the effects of general inflation.

12.105 We will retain our PR08 approach and make yearly RAB adjustments for variances between our general inflation assumptions (i.e. RPI) and the actual outturns rather than unnecessarily waiting for the end of the control period. This approach has no effect on Network Rail's revenues.

Main features of our RAB roll forward policy in CP5

12.106 The main features of our RAB roll forward policy for CP5 are set out below. There are four exceptions to this policy for the civils adjustment mechanism, early GRIP projects enhancements mechanism, projects with specific protocols and spend to save schemes, which are set out below:

(a) as the determination in England & Wales is separate to the determination for Scotland, renewals and enhancements will be rolled forward separately for England & Wales and Scotland in accordance with our PR08 determination. We will also roll forward the indicative RABs for the operating routes in the same way;

(b) to provide an appropriate balance of incentives and protections for Network Rail by adding actual efficient capex to the RAB in CP5 (subject to the RAB roll forward policy). This means that Network Rail is incentivised to manage its spend on renewals and enhancements efficiently, so will bear some of the effects of underperformance and will retain some benefit from outperformance (see the discussion on operating expenditure and capital expenditure incentives in the May 2012 document for further details);

(c) to encourage Network Rail to improve efficiency throughout CP5, the incentives the company faces are equalised across the five years of the control period. For example, Network Rail faces the same incentive to outperform in the last year of CP4 as it does in the first year of CP5 and will bear the same cost of efficient overspend in year 5 of CP5 as in year 1 of CP5;

(d) in order to simplify the calculations of the financial effect of a five year retention in our PR13 determination we have set the incentive rate at 25%, which is approximately the same as five years allowed return at 4.31% (the PR13 cost of capital). This is also called the 25% pain/gain sharing mechanism, which provides an appropriate incentive on Network Rail to manage costs efficiently but does not expose it too much to risk. Also, in order to simplify the calculation we make the relevant RAB additions/deductions in the year when they occur;

(e) if an efficient overspend is added to the RAB, Network Rail will generally bear 25% of the overspend (including when an overspend is offset against an efficient underspend). However, if the overspend is not eligible for a RAB addition, Network Rail will bear the cost of 100% of the overspend;

(f) Network Rail will retain 25% of an efficient underspend (irrespective of whether the underspend is due to a variance in volumes or unit costs);

(g) Network Rail will not be penalised for, or benefit from, rescheduling its capex programme (deferring work or bringing work forward) within CP5 where outputs are met[228]. By not penalising or rewarding Network Rail we mean that we will not treat the expenditure variance as an efficiency or inefficiency (subject to Network

[228] This should help to smooth the investment cycle – providing greater certainly and predictability for the supply chain. Also, it avoids incentivising Network Rail to inappropriately defer work or bring work forward.

Rail showing that the required outputs in CP5 have been delivered and there is no adverse effect on the serviceability and sustainability of the network in the short, medium or long-term). This means that we will adjust the RAB for the financial effect of rescheduling activity, so that Network Rail does not retain/bear the financing benefit/cost of the rescheduling, i.e. if there is a deferral of work from year 1 to year 2, in our PR08 determination Network Rail will have received an allowed return on that work for year 1. In order to make the effect of rescheduling within CP5 neutral, we will deduct from the RAB the amount of financing that Network Rail received for that work for the period until the work is completed in year 2. For the avoidance of doubt, these adjustments are not subject to the 25% pain/gain sharing mechanism; and

(h) as part of our on-going regulation of Network Rail, we will ensure that if it fails to either deliver any required outputs in CP5 or maintain the serviceability and sustainability of the network in the short, medium or long-term, then it will not retain the associated financial benefit. We will do this by either making an appropriate deduction from the RAB or not funding the company for any deferred work that it will be doing in CP5 as appropriate. We will make this adjustment regardless of whether there is an underspend or overspend. We will also make an adjustment for capitalised financing on the logged down amount and Network Rail will not retain 25% of an underspend.

12.107 The other main features of our RAB roll forward policy in CP5 will be:

(a) to ensure that our RAB roll forward policy is complied with, the audit of the regulatory accounts will confirm that the boundary between renewals and enhancements, and between maintenance and renewals/enhancements is the same as we used in our PR13 determination and the capitalisation of overheads is on the same basis as in our PR13 determination;

(b) for CP5, we have largely used Network Rail's statutory accounting policies as the basis for defining what can be added to the RAB as renewals and enhancements. This was because it is a transparent approach and one that is easy to understand;

(c) all RAB adjustments for the non-delivery of outputs or failure to maintain the serviceability and sustainability of the network in the short, medium or long-term,

deferrals within CP5, underspend and efficient overspend, will be calculated with reference to our PR13 determination, as that is how we set Network Rail's allowed revenue, RAB and debt assumptions for CP5;

(d) as PR13 is an output based determination, Network Rail should not benefit from a failure to deliver its required outputs. Therefore, in PR08 the adjustments for the non-delivery of outputs were based on the amounts of money saved by not delivering the outputs or failing to maintain the serviceability and sustainability of the network in the short, medium or long-term. This would include any savings in support costs, operations costs, maintenance costs and income. For PR13, we are discussing with Network Rail whether a value based adjustment would be more appropriate and we would welcome comments on the issue;

(e) given the information asymmetry between Network Rail and us, it is for Network Rail to show that a reduction in work volumes is efficient and does not inappropriately affect the serviceability and sustainability of the network in the short, medium or long-term. Where Network Rail cannot show that a reduction in volumes is efficient, any cost savings related to the deviation from the current agreed asset policies will be deemed inefficient and the related cost savings will be deducted from the RAB without Network Rail retaining 25% of the benefit. As in PR08 the burden of proof will be on Network Rail to show that it has delivered its required outputs. We will conclude about whether we should provide guidance on how an adjustment should be calculated for a failure to deliver required outputs in our RAGs in December 2013;

(f) manifestly inefficient enhancement expenditure will not be added to the RAB. Therefore, Network Rail will have to provide an explanation to us as to why additional investment is justified. This will ensure overspend that is:

(i) outside of the scope of the HLOS requirements (if relevant);

(ii) not meeting a customer reasonable requirement;

(iii) not related to railway activity; or

(iv) not adding economic value to the railway,

would be disallowed and not added to the RAB. We would expect a key element of Network Rail's justification would be evidence that internal project management and investment authorisation controls had been properly applied;

(g) overspend relating to additional volumes of work for renewals in England & Wales & Scotland will be added to the RAB unless the overspend is manifestly inefficient;

(h) given that CP5 is a five year price control, the assessment of the RAB is a cumulative assessment for CP5, i.e. an overspend in year 1 would be offset by underspend in year 2. This means that it will only be possible to finalise the value of the RAB once CP5 is completed. All annual calculations of the RAB during CP5 in Network Rail's regulatory accounts will therefore be provisional;

(i) in order to ensure the price control is sufficiently flexible to cope with planning uncertainty, where the governments or other funders request Network Rail to deliver additional outputs during the control period, we will log-up the efficient cost (including capitalised financing costs) of delivering the outputs for inclusion in the RAB at the beginning of the next control period; and

(j) to avoid undue complexity, agreed deferrals of expenditure from CP4 to CP5 (e.g. for elements of the electrification programme) will be treated under the CP5 RAB roll forward policy, unless agreed otherwise.

12.108 The actual outturn figures for renewals and enhancements expenditure in 2013-14 will not be available until the publication of the 2013-14 regulatory accounts in July 2014. We therefore intend, where appropriate (e.g. in relation to emerging cost enhancements), to make an adjustment as part of the next access charges review, to the CP6 opening RAB at 1 April 2019. The adjustment (including where relevant the associated capitalised financing) will take account, where appropriate, of the difference between the final outturn figures for CP4 shown in the 2013-14 regulatory accounts and the forecast 2013-14 RAB movements included in our PR13 final determination.

Process for the RAB roll forward in CP5

12.109 In summary, the process for rolling forward the RAB in each year of CP5 will be to:

(a) adjust the CP5 opening RAB per our PR13 determination into the price base of the relevant year;

(b) add the renewals and enhancements RAB additions (after adjusting for the effect of the RAB roll forward policy as described below);

(c) adjust for non-delivery of outputs or a failure to maintain the serviceability and sustainability of the network in the short, medium or long-term; and

(d) deduct our PR13 amortisation assumption.

12.110 The process set out above is the same as in CP4, except where we have changed our approach as discussed above, e.g. we are not adjusting for input price movements in CP5.

Civils adjustment mechanism

12.111 As explained in the asset management: maintenance and renewals expenditure chapter (chapter 8), Network Rail believes a significant backlog of work has developed in civils, but Network Rail's SBP did not fully demonstrate this, which prevented us from concluding on civils expenditure in our determination. Because of this we are having to take the unusual step of implementing a civils adjustment mechanism to the RAB in CP5 as follows:

(a) in years 1 and 2 of the control period, Network Rail will be expected to deliver the volumes of civils work that it proposed in its PR13 SBP. Any under or over spend on unit costs will be subject to the normal RAB roll forward policy described above. If Network Rail under-delivers on volumes it will have to catch up, so Network Rail will not benefit from an under-delivery including the capitalised financing effect. Over-delivery of volumes will be subject to the normal RAB roll forward policy; and

(b) the actual volumes and unit costs to be applied in years 3, 4 and 5 of the control period are not yet known. Our view on the level of efficient civils expenditure in these years will therefore depend on the outcome of our assessment of the plan of work that we have requested Network Rail to submit to us as soon as possible and which we will publish. These volumes and unit costs could be under or over those assumed in our determination. Any under or over spend compared to our revised determination values for unit costs reasons will be subject to the normal RAB roll forward policy as described above. If Network Rail under-delivers on volumes it will have to catch up, so Network Rail will not benefit from an under-

delivery including the capitalised financing effect. Over-delivery of volumes will be subject to the normal RAB roll forward policy.

12.112 Any adjustments to Network Rail's RAB and revenue requirement that are needed following our adjustments to the civils assumptions, will be logged up to Network Rail's RAB/the opex memorandum account for CP6 as appropriate.

Enhancements mechanism for early GRIP projects

12.113 The RAB roll forward policy for early GRIP projects will operate normally and for the avoidance of doubt an incentive payment that Network Rail makes to a TOC to help in delivering an efficient project can be included in the efficient cost of the project. However, as discussed in the enhancements expenditure chapter (chapter 9), the PR13 determination for enhancement costs will be adjusted at the end of 2014-15 following our review of the costs of the early GRIP projects. Any adjustments to Network Rail's RAB and revenue requirement that are needed following this review will be logged up to Network Rail's RAB/the opex memorandum account for CP6 as appropriate.

Projects with specific protocols

12.114 The following projects have either an established separate protocol or are subject to a target price arrangement that identifies a target price and a pain/gain share mechanism which will apply if outturn costs vary from the target price. The RAB would then be adjusted at the start of CP6 to reflect these arrangements. This approach should ensure that Network Rail is strongly incentivised to manage the financial risk of the project but is not exposed to open ended financial risk. We are discussing with the Welsh Government and DfT the specific arrangements for the Welsh Valleys project.

Thameslink

12.115 In CP5 Network Rail will complete the final stage of the Thameslink programme giving a further improved train service of up to 24 trains per hour between St Pancras and Blackfriars stations, at a total cost of about £1.6bn. This phase also provides the required infrastructure to allow operation through London Bridge, including a radical improvement of passenger facilities at this station. There is a protocol in place between Network Rail and DfT under which a target price has been agreed and Network Rail's obligations are defined.

Crossrail

12.116 The Crossrail project involves work outside of the central tunnel section with a total cost of about £1.5bn. These works will facilitate new train services from Maidenhead and Heathrow in the west to Shenfield and Abbey Wood in the east, which will increase London's rail based transport capacity and upgrade some 28 existing stations with longer platforms. A protocol is in place between Network Rail, Crossrail Limited and the Department for Transport that details Network Rail's obligations. Under the terms of this protocol a target price and incentive mechanism has been agreed.

Edinburgh to Glasgow Improvement Programme (EGIP)

12.117 The Edinburgh to Glasgow Improvement Programme (EGIP) programme will deliver more frequent and faster rail services between Scotland's two principal cities at a total cost in CP5 of around £500m. Network Rail and Transport Scotland are finalising commercial arrangements which will incorporate a pain/gain mechanism. Network Rail's obligations will be established in the enhancements delivery plan, which we will hold them to account for.

Borders

12.118 The Borders project comprises a new railway line linking the Midlothian and Scottish Borders areas to central Edinburgh and the existing national network at a total cost in CP5 of about £130m. Like EGIP, Network Rail and Transport Scotland are finalising commercial arrangements which will incorporate a pain/gain mechanism.

Spend to save

12.119 As explained in the spend to save section below, we are proposing to apply our normal RAB roll forward process to deal with spend to save schemes[229] in CP5 but amend it as described below, e.g. use different incentive strengths. We have therefore included in our determination an estimate of the total expenditure on information management schemes and income generating schemes in CP5 (including an estimate of income generating schemes that have not been approved yet) and the associated benefits.

[229] For the avoidance of doubt, when we say spend to save schemes we are including income generating schemes.

12.120 We are proposing to change the incentives on spend to save schemes so that the incentive is 25% in year 1 of the control period, 20% in year 2 of the control period, 15% in year 3 of the control period, 10% in year 4 of the control period and 5% in year 5 of the control period. This means that, for example, if Network Rail overspends/underspends in year 1 by £100, they will bear/retain £25 of the cost of that overspend/underspend but if it overspends/underspends in year 5, it will bear/retain 5% of the overspend/underspend. This compares to our normal RAB roll forward approach where, in simple terms, Network Rail retain 25% of an underspend and bear 25% of an overspend in each year of the control period.

12.121 The schemes that we are proposing this policy should apply to are:

(a) information management schemes that improve the business, i.e. this does not include schemes that just replace/update an existing capability; and

(b) income generating schemes.

Non-capex additions to the RAB and the opex memorandum account

12.122 We decided in PR08 that only capital expenditure will be added to the RAB. Incentive payments, which we have historically added to the RAB at the start of the next control period, are now remunerated via an operating expenditure (opex) style memorandum account. This works by 'logging up' the payment to the account during the control period and then releasing any monies from this account over an appropriate period of time, which is generally across the next control period.

12.123 In our December 2012 decisions document, we explained that we had decided to retain the use of the opex memorandum account for CP5. This is because it:

(a) avoids distorting the RAB;

(b) is more transparent;

(c) formalises the way these issues are resolved, which reduces regulatory risk; and

(d) allows us to smooth the effect, of the release of monies in this account to Network Rail, on Network Rail's income and charges.

Reactive maintenance

12.124 In our August 2012 consultation, we explained that we were considering whether Network Rail's reactive maintenance costs should be remunerated in the year the cost is incurred, (i.e. for the purpose of calculating the revenue requirement, treat

them in the same way as operating and other maintenance costs). This would improve transparency, as Network Rail currently accounts for reactive maintenance costs, as operating costs in its statutory accounts, and as capital expenditure (renewals) in its regulatory accounts (to be consistent with our PR08 determination), which means that at the moment Network Rail needs to provide a reconciliation of maintenance and renewals costs between its statutory accounts and its regulatory accounts.

12.125 Everything else being equal, the increase in maintenance costs (and hence the revenue requirement) would largely be offset by a reduction in amortisation (and hence the revenue requirement), as we would expect the average long-run steady state renewals to be lower by an equivalent amount[230]. This means that a change in this policy should not have a material impact on the revenue requirement.

12.126 Most respondents to our August 2012 consultation on financial issues thought that we should remunerate reactive maintenance costs in the year the cost is incurred largely because they thought that treatment was more transparent. Although, Network Rail did not want to remunerate reactive maintenance costs in the year the cost is incurred because:

(a) there could be an increase in preventative maintenance in CP5;

(b) there will still be differences between the regulatory and financial accounts; and

(c) the current regulatory treatment reflects how it manages civils expenditure.

12.127 However, in its SBP Network Rail assumed that its operational property inspections (CEFA) contract costs would all be remunerated in the year incurred (c£250m over five years). These costs are part of reactive maintenance costs. Since receiving the SBP, we have further discussed this issue with Network Rail and it thinks that it can identify reactive maintenance costs.

12.128 Given these factors, in order to improve transparency, we are proposing that Network Rail's reactive maintenance costs should be remunerated in the year the cost is incurred, i.e. they should be treated as maintenance costs.

[230] Although there could be an effect, as our calculation of efficiency for maintenance in CP5 is based on the five years of that control period, whereas the calculation of efficiency for average long-run steady state renewals in CP5, is over thirty-five years.

Funding of enhancements

12.129 In our August 2012 consultation, we consulted further on our approach to amortisation, and in particular whether enhancements should be amortised immediately after they come into use. We raised this issue because amortisation based on average long-run steady state renewals does not fund the original construction cost of an enhancement, just the renewals needed to maintain the asset in a suitable condition[231].

12.130 This is appropriate for an enhancement that adds long-term economic value to the network, e.g. some rail bridges are over 100 years old and are still in regular use. If there are enhancements proposed in the HLOSs, where the economic contribution that an enhancement provides to the network in the long-term is lower than its cost, we need to consider how they should be funded.

12.131 In our August 2012 consultation, we set out two options for funding HLOS enhancement expenditure where the economic contribution that an enhancement provides to the network in the long-term is lower than its cost[232].

12.132 The two options were:

(a) through amortisation. As our amortisation policy takes into consideration long-term financial sustainability issues, i.e. if we thought that the increase in debt as a result of these enhancements would not be sustainable, we could increase amortisation to reduce Network Rail's debt; or

(b) pay-as-you-go. Another option would be to fund these enhancements on a pay-as-you-go basis, i.e. they are remunerated like maintenance, or to amortise them over a fixed period of time reflecting their useful economic life.

12.133 Both of these options can resolve the funding issue and it is more transparent to fund these enhancements, on a pay-as-you-go basis, or amortise them over a fixed period of time, reflecting their useful economic life instead of increasing amortisation for financial sustainability reasons.

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[231] The operating, maintenance and financing costs of the asset would be funded in future periodic reviews.

[232] When the wider social benefit that the enhancement provides is included, the total contribution provided by the enhancement should be greater than its cost.

12.134 At a high-level we think that enhancements that can be added to Network Rail's RAB should be projects that are broadly consistent with our investment framework criteria for a RAB addition[233]. However, we recognise that the investment framework is not designed for HLOS funded schemes therefore some of the criteria are not relevant, e.g. the reference to other funders.

12.135 For our final determination, as part of our review of financial sustainability, we will consider whether, if there is an overall surplus above the level of funding contained in the SoFAs, we could treat some enhancements that do not provide a commercial return as pay-as-you-go projects, i.e. not add them to the RAB. This would improve financial sustainability and could be a more appropriate way of funding enhancements. We will take this decision in consultation with Network Rail and the governments, having regard to our statutory duties.

Investment framework/spend to save

12.136 In CP4, the investment framework allows Network Rail in certain situations to spend money on capital schemes that were not funded as part of PR08. This is the 'internal/Network Rail' part of the investment framework not the 'external' part that deals with third party investments[234]. This policy aimed to help to address the issue of the relatively poor incentive on Network Rail to make savings towards the end of a control period.

12.137 However, in practice this is a confusing policy as it means that when we assess Network Rail's proposed expenditure, we would exclude some elements of Network Rail's potential revenue generating schemes (e.g. refurbishment of arches) and cost saving schemes. It would also duplicate some elements of our RAB roll forward policy and would be inconsistent with other parts of our approach, i.e. some types of information management spend are very uncertain and its nature is similar to the spend that goes through the investment framework but we make an assumption for information management spend as part of our determination.

12.138 The two main options for improving our policy are:

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[233] The criteria are included in our investment framework consolidated policy and guidelines document, which is available at: http://www.rail-reg.gov.uk/server/show/ConWebDoc.10081.

[234] The internal part of the investment framework deals with schemes promoted by Network Rail that either generate additional income or reduce costs. The external part of the investment framework deals with schemes promoted by third parties, franchised operators and the governments (non-HLOS).

(a) refine the 'internal/Network Rail' part of the investment framework to improve incentives; or

(b) remove the 'internal/Network Rail' investment framework and apply our normal RAB roll forward process to deal with this issue but amend the RAB roll forward process as described below, e.g. use different incentive strengths.

12.139 The current approach to internal investment framework schemes has the effect of not incentivising Network Rail to invest in schemes that could reduce the cost of the network. This is because when we calculate the amount to be added to the RAB in the control period that the investment is made in, all the savings in that control period, are netted off the capital expenditure. We also include the savings that the investment has generated in future control periods, in our efficiency assumptions for those control periods.

12.140 The current approach also does not provide an incentive to make investments later in the control period, e.g. if Network Rail invest £100 more on income generating schemes in year 5 of the control period compared to our determination then using our normal RAB roll forward rules it would bear, i.e. not receive funding for, £25 of the cost. Therefore, in order for Network Rail to be financially incentivised to go ahead with the scheme, the scheme would need to generate savings of more than £25 in one year, which may not be likely.

12.141 In order to improve transparency and provide clearer incentives on Network Rail without overly complicating the financial framework, we are proposing to remove the 'internal/Network Rail' investment framework and apply our normal RAB roll forward process to deal with spend to save schemes but amend the RAB roll forward process as described below, e.g. use different incentive strengths. The amendment we are proposing to make is to change the amount of financial benefit Network Rail will retain/bear if it underspends or overspends. We would welcome comments on this issue.

12.142 We are proposing to change the incentives on spend to save[235] schemes so that the incentive is 25% in year 1 of the control period, 20% in year 2 of the control period, 15% in year 3 of the control period, 10% in year 4 of the control period and 5% in

[235] For the avoidance of doubt, when we say spend to save schemes we are including income generating schemes.

year 5 of the control period. This means that, for example, if Network Rail overspends/underspends in year 1 by £100, they will bear/retain £25 of the cost of that overspend/underspend but if it overspends/underspends in year 5, it will bear/retain 5% of the overspend/underspend. This compares to our normal RAB roll forward approach where, in simple terms, Network Rail retain 25% of an underspend and bear 25% of an overspend in each year of the control period.

12.143 Adopting this approach should improve the incentives on Network Rail to invest in spend to save schemes and should also have the effect of encouraging Network Rail to invest in spend to save schemes early in CP5 as they will have longer to benefit from that investment. It will also reduce the disincentive to make investments later in the control period as the amount of money added to the RAB will be higher than using the current approach or the normal RAB roll forward rules.

12.144 For the avoidance of doubt, we will add the efficient capital expenditure to the RAB in CP5, we will not deduct incremental efficiency savings achieved during CP5 from the value of the expenditure that will be added to the RAB and we would still add capitalised financing. Also, at the moment we carry out an ex-post review of 'internal/Network Rail' investment framework schemes and we will carry out a similar review of spend to save schemes to ensure that they should be added to the RAB.

12.145 The schemes that we are proposing this policy on spend to save should apply to are:

(a) information management schemes that improve the business, i.e. this does not include schemes that just replace/update an existing capability; and

(b) income generating schemes.

12.146 As we are proposing to adopt this approach, we have included in our determination an estimate of the total expenditure on information management schemes and income generating schemes in CP5 (including an estimate of income generating schemes that were not identified at time of the SBP) and the associated benefits.

12.147 We will discuss the issues with this proposed policy on spend to save projects further with Network Rail in the summer, in particular we will consider the effect of the proposed approach on Network Rail's incentives, the calibration of the incentives and what types of expenditure should be included in the mechanism and how we keep the mechanism as simple as possible.

Other financial issues

Incentive strengths

12.148 By incentive strengths, we mean how much Network Rail money gains/loses if it outperforms/underperforms our determination. For example, if at any time Network Rail efficiently underspends on maintenance by a pound it keeps a pound and if it overspends by a pound it pays out one pound more than it received (i.e. a 100% incentive strength). In other words, if we assumed in our determination that Network Rail would spend £300 on maintenance and it efficiently spends £200 then it keeps £100. The incentive strengths for capital expenditure are largely 25%, i.e. if Network Rail efficiently underspends by £100, it keeps £25.

12.149 In our May 2012 document, we decided to retain the PR08 incentive strengths for PR13. This will avoid unnecessary changes to our regulatory approach and should help make the incentives easier to understand.

Network grant

12.150 While we recognise the case for public subsidy of the railway, we would like to see much more of Network Rail's funding coming from train operators paying access charges and from other customers, with greater clarity over what public money is buying. This is in line with our preference for transparency and cost-reflective charges, which will in turn send signals for the efficient usage and provision of the network. It would also help avoid blurring the roles and responsibilities of Network Rail and the governments. The provision of network grants by the governments, and the lack of clarity over exactly what the governments are buying, can undermine Network Rail's accountability to its customers, which is not consistent with the more commercial relationships we would like to see drive behaviour in the industry. However, we see these changes happening over time.

12.151 We recognise that, at the moment, if we did not allow network grants to be paid 'in lieu of' fixed track access charges, the funds available to the Secretary of State and Scottish Ministers could be affected due to the governments' reporting rules and the processes the governments use to record expenditure.

12.152 In determining our PR13 policies, we are required to take into account all of our statutory duties. In relation to this issue we consider that two of our duties are particularly relevant: our duty to have regard to the funds available to the Secretary of

State and our duty that requires us, in summary, when having regard to guidance from the Scottish Ministers, to have regard to the expenditure that is to be incurred by them.

12.153 Taking these duties into account, we have decided to allow part of Network Rail's income to be provided directly from the governments through network grants, which will be set ex-ante for each year of CP5.

12.154 In the network grant chapter (chapter 17) we set out the options for calculating the level of network grant payments in CP5.

Use of financial outperformance

12.155 Financial outperformance can happen when Network Rail spends less in CP5 than we assumed in our determination as the efficient cost of delivering its required outputs and maintaining the sustainably and serviceability of the network in the short, medium and long-term.

12.156 Our determination will be challenging but achievable. This means that Network Rail is incentivised to financially outperform our determination. Therefore, there needs to be a policy in place to decide how any financial outperformance is used.

12.157 Our current policy for deciding how financial outperformance is used is set out in a policy statement that we issued in 2006[236].

12.158 In line with this policy, if Network Rail has financially outperformed in CP4, it can choose, after first consulting with stakeholders, how to use that financial outperformance. The main options are that the financial outperformance can be used to:

(a) pay down debt;

(b) fund investments that reduce the future cost or improve the outputs of the railway; or

(c) pay a rebate to DfT and Transport Scotland.

12.159 We closely monitor Network Rail's performance and report on it in our annual assessment of its efficiency and financial performance but the process for deciding

[236] *Monitoring and treatment of Network Rail's underspend and efficiency: policy statement*, ORR, January 2006, available at http://www.rail-reg.gov.uk/upload/pdf/273.pdf.

whether Network Rail is financially outperforming for the purpose of deciding how to use financial outperformance is not as clear as it could be. One particular issue is how the uncertainty of an assessment of financial performance in the early years of a five year control period is reflected in a decision about using financial outperformance.

12.160 We think this process can be improved and in particular Network Rail should base its decisions on using outperformance on our assessment of its financial outperformance as that is more consistent with the view we will take on Network Rail's financial position in the next access charges review.

12.161 In relation to the decision on how financial outperformance is used, we think the two main options are that we could:

(a) require that outperformance can only be used to pay down debt or fund R&D projects[237]; or

(b) allow Network Rail to decide how to use any financial outperformance, after having consulted with the governments and us about the best use of any financial outperformance. This would be a continuation of the approach used in CP4.

12.162 Given the importance that we place on Network Rail's financial sustainability, we think that any financial outperformance should be used to pay down debt or fund R&D projects up to a maximum value that will be decided in our final determination (option (a) above). In particular, given our views on network grant and that the grant payments should be fixed ex-ante as part of our determination, we do not think that financial outperformance should be used to make rebate payments to the governments in CP5 unless we are satisfied that there are exceptional circumstances. Network Rail has said that it will publish an update of its policy on the use of outperformance by the end of March 2014.

12.163 We intend to amend condition 4 of Network Rail's licence condition so that it more clearly reflects this policy and we will consult on these proposed changes to Network Rails' network licence in our consultation on changes to access contracts and the network licence to implement PR13, which we will publish on 12 July 2013.

[237] The maximum value of R&D projects that can be funded in this way will be decided in our final determination as discussed in the financial incentives chapter (chapter 19).

Grant dilution

12.164 Current track access contracts include a grant dilution provision that provides for increases in track access charges if the governments do not pay network grants according to the agreed schedule of payments.

12.165 In order to ensure that Network Rail recovers its required revenue and can finance its activities in the unlikely situation that the governments did not meet their funding obligations, we decided in December 2012 to retain the grant dilution provision in track access contracts for CP5.

Tax

12.166 Corporation tax is a normal business cost and as such is one of the building blocks of the revenue requirement. Our decision on the treatment of Network Rail's corporation tax costs is unlikely to have significant financial implications for Network Rail in CP5, as a result of its brought forward corporation tax losses and the effect of the adjusted WACC approach.

12.167 As Network Rail is unlikely to make significant corporation tax payments in CP5, the incentive effect on Network Rail of our corporation tax policy in CP5 could be significantly diluted as the effects of our incentives on corporation tax are largely realised in later control periods. However, it is still important that we clearly set out our approach to corporation tax in CP5, as income and expenditure decisions in CP5, will affect corporation tax payments in future control periods and could affect efficiency reporting in CP5.

The 'corporation tax double count'

12.168 In PR08, we determined that Network Rail had been overfunded for corporation tax in CP3 and decided that we would adjust for this overfunding[238]. This adjustment is called the corporation tax double-count. The adjustment is made by holding the amount of the double-count (£1.3bn) on account[239] and in CP4, we reduced it every year by the amount of corporation tax that we estimated would be payable by Network Rail. Under this approach, we would do this until the balance on the account reaches

[238] Network Rail's debt is lower as a result of this overfunding.

[239] This is a regulatory balance that we use to adjust Network Rail's revenue requirement for this overfunding.

zero. Once the balance reaches zero, we will fund Network Rail's efficient corporation tax payments through the regulatory corporation tax allowance.

12.169 As part of PR13 we have reviewed our approach to the corporation tax double-count. As a result of this review, we have decided to change our approach so that the value of the double count is deducted from Network Rail's opening RAB at the start of CP5. We think that this is more appropriate because it is more transparent than the PR08 approach.

Corporation tax incentive strengths

12.170 In PR08, when we determined our overall approach to the financial incentives on Network Rail, we determined the overall incentive strengths on income and expenditure on a net of tax basis, i.e. if the company outperforms by, say, £100 then the company will retain an overall net benefit of £78 (this assumes a corporation tax rate of 22%)[240]. In our May 2012 document, we decided to retain the incentive strengths on income and expenditure.

12.171 The way the incentive strengths are given effect is through our decisions on the roll forward of corporation tax balances from CP4 into CP5 and from CP5 into CP6. In PR08, we said that our approach to rolling forward corporation tax balances was that:

(a) we will not adjust the roll forward of corporation tax balances from CP4 into CP5 for variances in income, support costs, operations costs, BTP costs, RSSB costs, maintenance costs, financing costs and corporation tax[241];

(b) we will take account of the changes in future income, costs and hence potentially capital allowances as a result of our policies on rolling forward the RAB, when

[240] A more detailed example of this issue is, if the company outperforms by, say, £100 and an ex-ante approach has been adopted to the opening corporation tax CP5 balances, then the corporation tax the company will pay on the outperformance will not be reimbursed by us so the net benefit is £78 (this assumes a corporation tax rate of 22%). If the company underperforms by £100 and an ex-ante approach has been adopted then the reduction in corporation tax, as a result of the underperformance, will not be captured by us so the net cost is say £78. Using an ex-ante approach therefore reduces the net incentive to outperform as the financial consequences of outperforming (e.g. costs being lower than expected) are reduced. If we adjusted the corporation tax opening balances at the next control period for actual income and expenditure, then in the above example the taxation effects of the outperformance or underperformance would be adjusted for, so the company would retain £100 of the outperformance and bear £100 of the underperformance. Therefore, the incentive is increased but the financial consequences of underperforming (e.g. costs being higher than expected) are also increased.

[241] This means changes in corporation tax excluding the underlying differences in income, expenditure and financing costs, e.g. if a capital allowance rate changed.

rolling forward the corporation tax balances for variances in these elements of renewals and enhancements expenditure;

(c) we will take account of the changes in future revenue as a result of our policies on traction electricity and the licence fee and safety levy, when rolling forward the corporation tax balances for variances in those costs, to ensure that Network Rail is appropriately compensated for changes in these costs on a net of tax basis;

(d) where appropriate, we will adjust the roll forward of corporation tax balances in CP5 for any additional allowances that Network Rail has gained during CP4[242]; and

(e) we will consider whether changes in the treatment of some of its costs during CP4 should affect the CP5 opening corporation tax balances.

12.172 In our December 2012 financial framework decisions document, we said that we were discussing with Network Rail whether we should retain the above approach or whether we should amend the PR08 approach to take more account of Network Rail's actual corporation tax position in CP4, as that may be a simpler and more transparent way of rolling forward Network Rail's corporation tax position from CP4 into CP5, without unduly affecting customers and funders and without having an effect on Network Rail's incentives.

12.173 This is because the corporation tax issues in CP4 relate to events that have largely already happened and as explained above the incentive effect of our decisions is diluted anyway, as Network Rail is unlikely to make significant corporation tax payments in CP4 or CP5. This would also be consistent with the views of respondents to our August 2012 financial framework issues consultation who generally wanted us to take as simple an approach to the treatment of corporation tax as possible.

12.174 For our PR13 determination, we have decided to take our view of Network Rail's latest forecast of CP5 opening tax balances based on our view of Network Rail's forecast efficient position at 31 March 2014 (i.e. the end of CP4), rather than use the

[242] In PR08, some aspects of the calculation of Network Rail's corporation tax payments where Network Rail could possibly claim enhanced allowances (e.g. for research and development expenditure or expenditure on energy saving or environmentally beneficial equipment) were uncertain and in PR08 Network Rail did not provide an estimate of the impact of these issues. Given this uncertainty, we assumed that Network Rail would not receive any benefit from these schemes.

PR08 approach. Network Rail agrees with this approach. Although this is a change in policy that effects Network Rail's position in CP4, we think that this is the most simple and pragmatic approach, given the relatively low levels of corporation tax paid by Network Rail and given Network Rail's current low levels of corporation tax, we think that the impact on its incentives will be minimal.

Value added tax

12.175 We have reviewed how value added tax issues could affect Network Rail in CP5. This was informed by a study by our consultants, Alvarez & Marsal. The potential claims in relation to outstanding historic issues are uncertain and Network Rail has not forecast in its SBP that they will receive any benefit from these potential claims. Network Rail's assumption is conservative. Given the uncertainty of these claims, we will assume that Network Rail does not receive any benefit from these potential VAT issues in CP5. We are also proposing to adjust CP6 for any benefit that Network Rail receives in CP5 from these VAT issues and we are proposing not to include any of these VAT gains in financial performance in CP6.

Financial ring-fence

12.176 The financial ring-fence protects customers and funders from the company being exposed to financial risks, e.g. it limits Network Rail from taking part in activities that are not part of its core business as the operator of the majority of Great Britain's rail infrastructure.

Network Rail's activities

12.177 As part of PR08, we reviewed some aspects of the financial ring-fence but deferred a review of other financial ring-fence issues. The work we deferred included a review of the activities that Network Rail is permitted to carry out under the provisions of its network licence. We did consult on this issue in March 2010[243] but deferred taking a decision as the structure of the industry was being reviewed, which could have impacted on our decisions.

12.178 Although there is still some uncertainty about the future structure of the industry there is more clarity in some areas and we have started to discuss with Network Rail, DfT and Transport Scotland and other stakeholders their views of the activities that

[243] Our consultation is available at: http://www.rail-reg.gov.uk/upload/pdf/ring-fence-consultation-310310.pdf.

Network Rail should be permitted to carry out under the provisions of its network licence. Network Rail has said that there should be more flexibility to expand the scope of its operations where that improves value for money.

12.179 However, these discussions with stakeholders have not reached a stage where it is appropriate to further review the activities that Network Rail is permitted to carry out under the provisions of its network licence as part of PR13, especially as the current de-minimis provisions in Network Rail's network licence already provide a reasonable approach to these issues. If following the conclusion of these discussions, we think it is appropriate to propose a review of the activities that Network Rail is permitted to carry out under the provisions of its network licence, we will do so after PR13.

Other issues

12.180 In our consultation on the changes to contractual and licensing provisions to implement PR13 that we will publish on 12 July 2013, we will identify any areas where the financial ring-fence needs to be updated. In particular, we will consider whether changes to other regulators' financial ring-fences are relevant, as we want to keep the financial ring-fence up to date with regulatory best practice.

12.181 Also, in that consultation we will identify any areas of the financial ring-fence where the drafting of the financial ring-fence can be improved or simplified. One area that could be made clearer is the restriction on Network Rail making a rebate, so we will propose including a specific section in Network Rail's network licence that restricts it from making a rebate to DfT or Transport Scotland without our consent.

Outperformance

12.182 In our August 2012 consultation we explained that we had considered whether our approach to incentive strengths for Network Rail's operating expenditure and capital expenditure needed refining to encourage Network Rail to materially outperform our determination and to avoid materially failing to deliver our determination. We also considered whether efficiency initiatives that are genuine 'game changers' should be more heavily incentivised than normal efficiency savings as they are important in identifying ways to meet Network Rail's long-term efficiency challenge.

12.183 Given it is difficult to distinguish between 'game-changers' and normal efficiency initiatives and it is also difficult to identify which efficiency initiative takes Network Rail beyond the target level and into the outperformance area, and that we are trying to

keep the calculation of efficiency as simple as possible, we have decided that it is not appropriate to more heavily incentivise ‘game-changers’ than normal efficiency savings in CP5. However, we do consider that this is an important issue for CP6, so we will start work developing our ideas in this area in 2014-15 and consult on the issues as part of PR18.

13. Impact of financial framework on financial parameters

Key messages in this chapter

- This chapter sets out the impact of our financial framework on the financial parameters in our determination.
- Our consultants have assessed Network Rail's cost of capital and financing costs by considering market data and regulatory precedent.
- Although we are using the adjusted WACC approach to set Network Rail's revenue requirement it is still important to identify Network Rail's WACC, which we have determined as 4.31% for Great Britain, England & Wales and Scotland.
- Our assumption for Network Rail's embedded debt costs is 3.74% nominal and 1.40% index-linked for Great Britain, England & Wales and Scotland.
- Our assumption for Network Rail's new debt costs is 2.93% nominal and 1.24% index-linked for Great Britain, England & Wales and Scotland.
- Our FIM fee assumption is 1.10% for Great Britain, England & Wales and Scotland.
- Our amortisation assumption is £12.2bn for Great Britain, £10.8bn for England & Wales and £1.3bn for Scotland.

Introduction

13.1 The financial framework chapter (chapter 12) sets out our determination of the financial framework for Network Rail in CP5. This chapter sets out the impact of those financial framework decisions on the financial assumptions within our determination.

13.2 In this chapter we provide our assumptions on Network Rail's cost of capital, financing costs, corporation tax, opening CP5 debt, opening CP5 RAB, amortisation, and other key financial information. These assumptions are used to calculate Network Rail's CP5 revenue requirement. Also, our PR13 financial model has been audited and we summarise in this chapter the auditor's views.

Cost of capital

13.3 As we mention above, Network Rail is a CLG and raises debt like a normal company but the debt is government guaranteed. However, it is still important to identify

Network Rail's notional cost of capital to encourage Network Rail to invest efficiently, achieve the appropriate balance between maintenance and renewals, and ensure a level playing field (between Network Rail and potential competitors) for the delivery of enhancements.

13.4 Therefore, our cost of capital[244] assumption is based on a hypothetical scenario in which Network Rail does not have access to the FIM and is also financed by equity as well as debt. This cost of capital is distinct from our forecast of efficient financing costs in CP5, which drives the allowed return in the adjusted WACC approach used to calculate Network Rail's revenue requirement in CP5.

13.5 In particular, Network Rail will use this cost of capital as the basis for its decisions on investment framework schemes. Therefore, our assumptions on the cost of capital affect our income assumptions for investment framework projects as explained in the chapter on other single till income (chapter 18). Given the importance of Network Rail's cost of capital and in order to be transparent, in annex F we have provided details of the revenue requirement on the basis that the allowed return is based on Network Rail's cost of capital and the adjusted WACC approach is not used.

13.6 Our consultants, a consortium led by CEPA in association with Lion's Head Global Partners and Indepen (hereafter referred to as "CEPA"), have been advising us on the appropriate cost of capital for Network Rail[245]. Table 13.1 provides a comparison of CEPA's cost of capital estimates with those provided by Network Rail and Oxera (Network Rail's consultant).

Table 13.1 Comparison of cost of capital assumptions against Network Rail's SBP and our PR08 assumption

	ORR	Oxera (NR SBP)	CEPA Estimate – narrow range[1,2]	
	PR08	January 2013	Low	High
Gearing	60.0%	61.25%	62.5%	62.5%
Risk-free rate	1.80%	1.75%	1.50%	1.75%

[244]The cost of capital is the return required by debt and equity investors on their investment in a company. It therefore reflects the costs of financing the risks that the company faces.

[245] CEPA's report is called "Advice on estimating Network Rail's cost of capital" and is available at: http://www.rail-reg.gov.uk/pr13/publications/consultants-reports.php.

	ORR	Oxera (NR SBP)	CEPA Estimate – narrow range[1,2]	
	PR08	January 2013	Low	High
Equity risk premium	5.00%	5.13%	5.00%	5.00%
Equity beta	1.00	0.98	0.90	1.00
Post-tax cost of equity	6.80%	6.75%	6.00%	6.75%
Pre-tax cost of debt	3.38%	3.30%	2.50%	3.00%
Vanilla WACC	**4.75%**	**4.65%**	**3.80%**	**4.40%**
Pre-tax WACC (t=20.2%)[3]	5.43%	5.40%	4.40%	5.05%

Source: CEPA analysis, Oxera, First Economics and ORR

Notes:

1. For calculating the WACC, CEPA used the mid-point gearing of 62.5%.
2. Figures rounded to the nearest 0.05%.The corporation tax rate of 20.2% is an average across CP5 of 21% for 2014-15 then 20% thereafter.
3. ORR's PR08 assumption has been restated using the 20.2% corporation rate to be more comparable.

13.7 In summary, CEPA's range for Network Rail's cost of capital is 3.80% to 4.40% (real vanilla[246]). This compares to a range of 4.3% to 4.9% that Network Rail's consultants Oxera used to inform Network Rail's SBP (Network Rail assumed its cost of capital was 4.75% in its SBP).

13.8 We have considered the views of CEPA and Oxera, and we have taken into account the decisions of other regulators, e.g. Ofgem and CAA[247]. Given the changes in the financial markets and in particular the cost of debt, we think it is appropriate to propose a cost of capital of 4.31% (real vanilla) for Network Rail in CP5. On a pre-tax basis this is 4.91%.

13.9 We would welcome comments on Network Rail's cost of capital for CP5 and in particular the pre-tax cost of capital that will be used for investment framework schemes.

[246] A 'vanilla' return is based on a pre-tax cost of debt and a post-tax cost of equity.

[247] These are the regulators who have published recent analysis on cost of capital.

Financing costs

13.10 In determining our financing cost assumptions, we take into consideration the type of financing strategy that an efficiently financed regulated utility could be expected to have in place based on historic, present and expected market conditions.

13.11 We commissioned CEPA to conduct an independent review of Network Rail's financing cost assumptions, which we have taken into account in deciding on our financing cost assumptions. Table 13.2 below summarises Network Rail and CEPA's views of Network Rail's financing costs.

Table 13.2 Summary of financing costs assumptions (Network Rail's SBP and CEPA)[248]

Type of debt	NR SBP	CEPA	Comment
Nominal debt (embedded)	3.75%	3.74%	The difference is due to rounding.
Index linked debt (embedded)	1.40%	1.40%	No difference.
Nominal debt (new)	4.63%	2.43%[249]	The difference is due to different assumptions on interest rate and credit spreads and in particular CEPA has not assumed that Network Rail needs as much of a risk buffer as Network Rail assumed.
Index-linked debt (new)	1.40%	1.15%	CEPA has taken account of current market pricing.

Embedded debt

13.12 CEPA has worked with Network Rail to model the interest payments on Network Rail's existing debt at the time of our draft determination, in order to verify how much those payments will be and whether they were efficiently incurred. In addition to modelling the interest costs, we along with CEPA have considered Network Rail's treasury policy, for example, the timing of Network Rail's pre-CP4 hedging programme and the mix of debt such as nominal against index linked and the tenor of the bonds.

13.13 CEPA's view is that Network Rail's existing debt[250] was efficiently raised at an efficient rate. Therefore, the subsequent financing costs on that debt have also been efficiently

[248] The rates in this table are annual rates. In our financial modelling we use semi-annual rates as discussed in the financial framework chapter (chapter 12).

[249] This is the average of the annual interest rates for each year of CP5.

incurred. After discussing this issue with Network Rail and CEPA, we have concluded that there is no evidence that the debt was inefficiently incurred. Therefore, we have included CEPA's estimate of Network Rail's embedded debt costs in our determination. We will update this assumption for our final determination to take account of any additional efficient debt issued before then.

New debt

13.14 CEPA's analysis is based on current interest rates, market information and their view of an appropriate treasury strategy. For our final determination, we will review whether our assumptions need to be updated, e.g. for movements in market rates. Any adjustments we make will be consistent with an efficient treasury strategy.

13.15 CEPA has also assumed that Network Rail will issue some index-linked debt in CP5. Until the debt is redeemed, everything else being equal, Network Rail's index-linked debt pays out a lower amount of money than nominal debt as the debt increases with inflation annually instead of an assumption on inflation being included in the cash interest cost.

13.16 The amount of indexed-linked debt that we assume Network Rail takes out in CP5 effects the revenue requirement because the adjusted WACC approach funds cash financing costs and the inflation element of the index-linked debt is funded through the indexation of Network Rail's RAB.

13.17 CEPA think that an efficient financing strategy in CP5 would result in some index-linked debt being taken out. We agree with this, so we have assumed in our financial modelling that Network Rail will take out some index-linked debt in CP5.

FIM fee

13.18 Network Rail's SBP proposed a FIM fee of 1.25% based on the difference in CP4 between the cost of bonds issued by utility companies and the cost of Network Rail's government backed bonds.

13.19 CEPA's analysis considered the difference in the cost between bonds issued by domestic utilities (A- and BBB+ rated)[251] and gilts (debt issued by the UK government)

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[250] Note: This is not a comment about the reasons for the debt being incurred, e.g. for capital expenditure but about the efficiency of Network Rail in raising the debt.

[251] A credit rating A- and BBB+ is consistent with an investment grade credit rating and the credit rating Network Rail might want to have if it did not have access to the FIM.

for a period from 1999 to present. This showed a difference of 1.40% - 1.60%. As a cross check, CEPA identified a similar difference (1.30% -1.40%) on the iBoxx[252] trailing average index (incorporating the discount for long dated debt) for utility bonds.

13.20 Since it has had access to the FIM, Network Rail has issued bonds at around 0.40% above the cost of gilts. Therefore, by deducting the difference between the cost of borrowing for Network Rail and the cost of gilts, from the difference between the cost of borrowing for comparable companies to Network Rail and the cost of gilts, CEPA have derived an estimate of the credit enhancement provided by the FIM relative to an A-/BBB+ rated company of 0.90% – 1.20% and they think the FIM fee should be towards the top end of that range, e.g. they mention that the FIM fee could be 1.10% based on a recent issuance by High Speed 1 (which is not government backed).

13.21 Given these factors, we have decided that the fee payable to DfT for the provision of the FIM will be set at 1.10% on the outstanding FIM-backed debt during CP5. We think that this fee broadly reflects the long-run value of the credit enhancement that Network Rail benefits from as a result of the FIM.

Tax

13.22 Our consultants, Alvarez & Marsal, have reviewed Network Rail's forecast corporation tax position and we have made some relatively small adjustments to Network Rail's corporation tax forecasts. As discussed in the financial framework chapter (chapter 12), we have assumed that Network Rail does not receive any benefit from potential VAT issues in CP5.

Opening debt

13.23 The opening debt assumptions at the start of CP5 used in this determination are based on Network Rail's SBP forecast debt balances at the end of CP4. As part of its review of Network Rail's financing costs, CEPA assessed Network Rail's debt issuance programme through CP4 to date and found no evidence that Network Rail's debt strategy was inefficient. As part of our final determination, we will review whether Network Rail's assumptions are still appropriate, e.g. there might be changes to renewals and enhancement schemes, which affect debt.

[252] iBoxx provide an index of the cost of bonds. The iBoxx index is also used by Ofgem for its indexation of energy companies' debt costs.

13.24 Table 13.3 is an analysis of Network Rail's forecast debt at 1 April 2014 and we identify how much of Network Rail's debt is nominal and index-linked.

Table 13.3 Summary of Network Rail's opening debt at 1 April 2014

Opening debt (£m (nominal prices))	Great Britain	England & Wales	Scotland
Nominal debt	15,563	14,060	1,503
Index-linked debt	15,586	14,081	1,505
Total debt	**31,149**	**28,141**	**3,008**

Opening RAB

13.25 The opening RAB assumptions at the start of CP5 used in this determination are based on Network Rail's SBP forecast RAB balances at the end of CP4, except we have adjusted its forecast to reflect our decision to reduce the RAB by the value of the corporation tax double-count adjustment (£1.3bn for Great Britain). As part of our final determination, we will review whether Network Rail's assumptions are still appropriate, e.g. there might be changes to renewals and enhancement schemes, which could affect the value of the RAB.

13.26 Table 13.4 is a summary of our adjustment to Network Rail's forecast RAB at 1 April 2014.

Table 13.4: Summary of our adjustment to Network Rail's forecast RAB at 1 April 2014

£m (2012-13 prices)	Great Britain	England & Wales	Scotland
Opening CP5 RAB per Network Rail's SBP	47,902	43,074	4,828
Corporation tax double-count adjustment	(1,286)	(1,152)	(134)
Opening CP5 RAB for the draft determination	**46,616**	**41,922**	**4,694**

Amortisation

13.27 As we set out in the financial framework chapter (chapter 12) amortisation includes three elements: average long-run steady state renewals, amortisation of the non-capex RAB and a financial sustainability adjustment.

13.28 Average long-run steady state renewals are based on the average of our renewals forecasts for the period from CP5 to CP11 as set out in the asset management: maintenance and renewals expenditure chapter (chapter 8). The non-capex RAB is amortised on a straight line basis over 30 years and the financial sustainability adjustment for CP5 is the difference between our forecast of renewals in CP5 and the total of average long-run steady state renewals and non-capex amortisation.

13.29 Table 13.5 is a summary of our amortisation assumptions for CP5.

Table 13.5 Summary of our amortisation assumptions for CP5

£m (2012-13 prices)	Annual average CP5 amortisation		
	Great Britain	**England & Wales**	**Scotland**
Average long-run steady state renewals	1,789	1,595	194
Non-capex amortisation	170	153	17
Total long-run steady state amortisation (inc non-capex amortisation)	**1,959**	**1,748**	**211**
Financial sustainability adjustment	476	420	56
Total amortisation	**2,435**	**2,168**	**267**

Opex memorandum account

13.30 As we set out in the financial framework chapter (chapter 12), in PR08, we said that only capital expenditure will be added to the RAB from the start of CP4. Incentive payments, which in previous control periods we have added to the RAB at the start of the control period following the control period in which the payment is earned, will instead be remunerated via the opex memorandum account, e.g. the volume incentive. This works by 'logging up' the payment to the account during the control period and then reimbursing Network Rail in the following control period.

13.31 Also, the opex memorandum account includes issues that needed adjustment, clarification or correction in CP4, e.g. adjustments for the costs of the seven day railway and capacity charges. Some of these adjustments relate to monies that Network Rail should have received in CP4. Therefore where appropriate, our determination needs to include these amounts.

13.32 We have used Network Rail's SBP forecasts of the CP4 opex memorandum account closing balance as the basis of our closing balance at 31 March 2014, except that we

have adjusted Network Rail's forecast to reflect our own forecast of volume incentive payments (see the financial incentives chapter (chapter 19)).

13.33 Table 13.6 provides an analysis of our forecast of the closing balance at 31 March 2014 on Network Rail's opex memorandum account.

Table 13.6 Summary of our forecast of Network Rail's opex memorandum account balance at 31 March 2014

(£m 2012-13 prices)	CP4 forecast closing balance at 31 March 2014
Great Britain	
Volume incentive	70
Euston and Victoria property sales income shortfall	72
Capacity charge error	49
NSIP[253] underspend on maintenance allowance	-76
Cumulo rates underspend	-8
ORR costs (licence fee, safety levy and independent reporter costs)	8
Total for Great Britain	**115**
England & Wales	**111**
Scotland	**4**

13.34 We have assumed that the balance on the opex memorandum account at 31 March 2014 is released to Network Rail on a straight line basis over CP5.This produces an average payment of £23m per annum (2012-13 prices) in CP5 for Great Britain, which is included in the revenue requirement.

13.35 We will update our view of the forecast balance on this account at 31 March 2014 in our final determination, which will effect Network Rail's revenue requirement in CP5. We will adjust in CP6 for any difference between our assumptions in our final determination and the final outturns for the five year period ended 31 March 2014.

[253] National Stations Improvement Programme.

Financial modelling

13.36 In PR13, we have used an excel-based financial model to support our determination of Network Rail's CP5 revenue requirement. As part of our quality assurance processes, the PR13 financial model has been audited by an independent consultancy firm, PKF (UK) LLP (now BDO LLP). In January 2012, we commissioned PKF (UK) LLP to carry out an audit of the financial model that we used for our advice to ministers analysis and in January 2013, we again commissioned PKF (UK) LLP to audit the financial model that supports our draft determination analysis.

13.37 Both audits provided assurance that the PR13 financial model was logically constructed, internally consistent and that the formulae, algorithms and calculations were materially accurate. The reporting responsibility of BDO LLP is to the Office of Rail Regulation. Prior to publishing our final determination we will commission a final review of the financial model that we will use to support our final determination analysis.

Other key financial information

13.38 We set out in Tables 13.7, 13.8 and 13.9 some key financial information such as our assumptions on debt, RAB, financing costs, the FIM fee, the adjusted interest coverage ratio and the debt/RAB ratio.

Table 13.7: Our assumptions on key financial information for Great Britain in CP5

£millions	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
£million (2012-13 prices)						
Closing debt	33,037	35,522	37,692	39,481	40,118	40,118
Closing RAB	49,355	52,346	55,093	57,523	58,855	58,855
£million (nominal prices)						
Financing costs (exc FIM fee)	714	758	879	1,019	1,166	4,535
FIM fee	362	403	442	478	507	2,191
Total financing costs	1,076	1,161	1,321	1,497	1,673	6,726
Adjusted interest coverage ratio	1.02 x	1.02 x	1.02 x	1.02 x	1.02 x	1.02 x
Debt / RAB ratio	66.9%	67.9%	68.4%	68.6%	68.2%	68.2%

Table 13:8: Our assumptions on key financial information for England & Wales

£millions	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
£million (2012-13 prices)						
Closing debt	29,712	31,778	33,698	35,420	36,086	36,086
Closing RAB	44,216	46,738	49,172	51,466	52,755	52,755
£million (nominal prices)						
Financing costs (exc FIM fee)	643	679	785	912	1,046	4,065
FIM fee	326	361	395	428	455	1,966
Total financing costs	969	1,040	1,180	1,340	1,501	6,031
Adjusted interest coverage ratio	1.02 x	1.02 x	1.02 x	1.02 x	1.02 x	1.02 x
Debt / RAB ratio	67.2%	68.0%	68.5%	68.8%	68.4%	68.4%

Table 13:9: Our assumptions on key financial information for Scotland in CP5

£millions	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
£million (2012-13 prices)						
Closing debt	3,326	3,744	3,994	4,061	4,032	4,032
Closing RAB	5,139	5,608	5,921	6,058	6,101	6,101
£million (nominal prices)						
Financing costs (exc FIM fee)	70	79	94	107	119	470
FIM fee	36	42	47	50	52	225
Total financing costs	106	121	141	157	171	695
Adjusted interest coverage ratio	1.01 x	1.01 x	1.01 x	1.01 x	1.01 x	1.01 x
Debt / RAB ratio	64.7%	66.8%	67.5%	67.0%	66.1%	66.1%

14. Network Rail's revenue requirement

Key messages in this chapter

- This chapter provides our determination of Network Rail's CP5 gross and net revenue requirements, based on our assessment of income and expenditure and our regulatory framework.
- Network Rail's net revenue requirement in CP5 is on average £5.5bn per annum in Great Britain, £4.9bn per annum in England & Wales and £0.6bn per annum in Scotland. This compares to Network Rail's SBP, which assumed that Network Rail's net revenue requirement in CP5 would be on average £5.8bn per annum in Great Britain, £5.2bn per annum in England & Wales and £0.6bn per annum in Scotland.

Introduction

14.1 This chapter provides our determination of Network Rail's CP5 gross and net revenue requirements, based on our assessment of income and expenditure and our regulatory framework. The revenue requirements represent the income and charges that are consistent with Network Rail delivering its regulatory outputs in CP5. The gross revenue requirement in CP5 is the total income Network Rail needs to operate its business. The net revenue requirement is calculated by deducting Network Rail's other single till income, (e.g. property income), from the gross revenue requirement and is received through access charges and network grant paid by governments ('in lieu of' some fixed track access charges).

Revenue requirements

14.2 Figures 14.1, 14.2 and 14.3 set out the net revenue requirements for Great Britain, England & Wales and Scotland in CP5. These revenue requirements have been calculated after our reclassification of reactive maintenance costs to maintenance from renewals. We have not restated our PR08 or SBP comparisons for the reclassification of reactive maintenance.

14.3 Tables 14.1 to 14.12 summarise our CP5 expenditure assumptions and the determination of the net revenue requirements and provide a comparison between our

assumptions and Network Rail's SBP for Great Britain, England & Wales and Scotland. Indicative revenue requirements for Network Rail's operating routes are presented in annex D.

Great Britain

14.4 The net revenue requirement is £1.8bn lower than Network Rail's forecast in its SBP, largely because our assumption on Network Rail's adjusted allowed return is £2.4bn lower than Network Rail's as we are assuming lower financing costs in CP5 and our other single till income assumption is £0.2bn higher as we are assuming more property income, which has the impact of lowering the revenue requirement compared to the SBP. This is offset by our total amortisation assumption being £0.7bn higher than Network Rail's as we have made a larger adjustment for financial sustainability than Network Rail did. The differences in financing costs, amortisation and other single till income between our determination and the SBP are further explained in the impact of financial framework on financial parameters chapter (chapter 13) and other single till income chapter (chapter 18).

Figure 14.1: Our assessment of Network Rail's CP5 revenue requirement for Great Britain

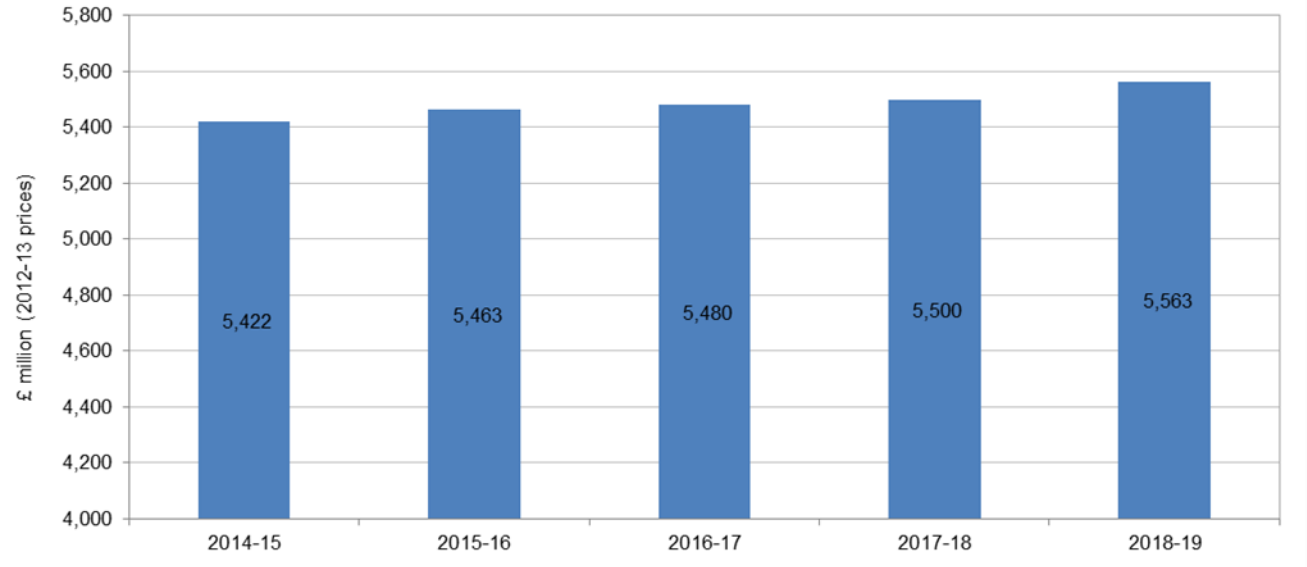


Table 14.1: Our assessment of Network Rail's CP5 expenditure for Great Britain

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Support costs	462	440	412	398	381	2,093
Network operations	425	412	395	378	358	1,968
Traction electricity, industry costs and rates	497	592	622	664	739	3,114
Network maintenance	1,086	1,070	1,035	998	963	5,152
Schedule 4 & 8 costs	221	234	240	218	217	1,131
Total operating expenditure	**2,692**	**2,748**	**2,703**	**2,656**	**2,658**	**13,456**
Renewals	2,475	2,586	2,476	2,365	2,272	12,173
Enhancements	2,699	2,840	2,706	2,500	1,495	12,239
Total capital expenditure	**5,174**	**5,425**	**5,182**	**4,865**	**3,767**	**24,413**
Total expenditure	**7,865**	**8,174**	**7,885**	**7,520**	**6,424**	**37,869**

Table 14.2: Our assessment of Network Rail's CP5 revenue requirement for Great Britain

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Total operating expenditure	2,692	2,748	2,703	2,656	2,658	13,456
Add: Long-run steady state amortisation (including non-capex amortisation)	1,959	1,959	1,959	1,959	1,959	9,794
Add: Regulatory tax allowance	4	4	4	4	3	18
Add: Opex memorandum account	23	23	23	23	23	115
Gross rev. req. before cost of capital	**4,677**	**4,734**	**4,689**	**4,641**	**4,643**	**23,384**
Add: Allowed return (real cost of capital)	2,025	2,145	2,266	2,376	2,455	11,267
Less: Real equity surplus	(1,008)	(1,079)	(1,085)	(1,071)	(1,037)	(5,280)
Adjusted allowed return	1,016	1,067	1,182	1,304	1,418	5,987
Gross rev. req. pre-sustainability adjustments	**5,693**	**5,800**	**5,871**	**5,946**	**6,061**	**29,371**
Add: Additional amortisation (sustainability adjustment)	476	476	476	476	476	2,379
Gross revenue requirement	**6,169**	**6,276**	**6,347**	**6,421**	**6,536**	**31,749**
Less: Other single till income	(747)	(813)	(867)	(921)	(973)	(4,321)
Net revenue requirement	**5,422**	**5,463**	**5,480**	**5,500**	**5,563**	**27,428**

Table 14.3: Our comparison of CP5 expenditure for Great Britain

£millions (2012-13 prices)	PR08	SBP	Determination
Support costs	4,113	2,232	2,093
Network operations		2,027	1,968
Traction electricity, industry costs and rates	2,175	3,701	3,114
Network maintenance	6,126	4,669	5,152
Schedule 4 & 8 costs	870	712	1,131
Total operating expenditure	**13,284**	**13,341**	**13,456**
Renewals	13,141	14,365	12,173
Enhancements	9,296	12,388	12,239
Total capital expenditure	**22,437**	**26,754**	**24,413**
Total expenditure	**35,721**	**40,095**	**37,869**

Table 14.4: Our comparison of CP5 revenue requirement for Great Britain

£millions (2012-13 prices)	PR08	SBP	Determination
Total operating expenditure	13,284	13,341	13,456
Add: Long-run steady state amortisation (including non-capex amortisation)	8,903	10,540	9,794
Add: Regulatory tax allowance	-	-	18
Add: Opex memorandum account	-	138	115
Gross rev. req. before cost of capital	**22,187**	**24,019**	**23,384**
Add: Allowed return (real cost of capital)	10,455	13,092	11,267
Less: Real equity surplus	-	(4,716)	(5,280)
Adjusted allowed return	10,455	8,376	5,987
Gross rev. req. pre-sustainability adjustments	**32,642**	**32,395**	**29,371**
Add: Additional amortisation (sustainability adjustment)	-	970	2,379
Gross revenue requirement	**32,642**	**33,365**	**31,749**
Less: Other single till income	(3,523)	(4,138)	(4,321)
Net revenue requirement	**29,119**	**29,227**	**27,428**

Note: total amortisation for each scenario is as follows: PR08 (£8.9bn); SBP (£11.5bn); Determination (£12.2bn)

England & Wales

14.5 The net revenue requirement is £1.6bn lower than Network Rail's forecast in its SBP, largely because our assumption on Network Rail's adjusted allowed return is £2.2bn lower than Network Rail's as we are assuming lower financing costs in CP5 and our other single till income assumption is £0.2bn higher as we are assuming more property income, reducing the revenue requirement. This is offset by our total amortisation assumption being £0.6bn higher than Network Rail's as we have made a larger adjustment for financial sustainability than Network Rail did. The differences in financing costs, amortisation and other single till income between our determination and the SBP are further explained in the impact of financial framework on financial parameters chapter (chapter 13) and other single till income chapter (chapter 18).

Figure 14.2: Our assessment of Network Rail's CP5 revenue requirement for England & Wales

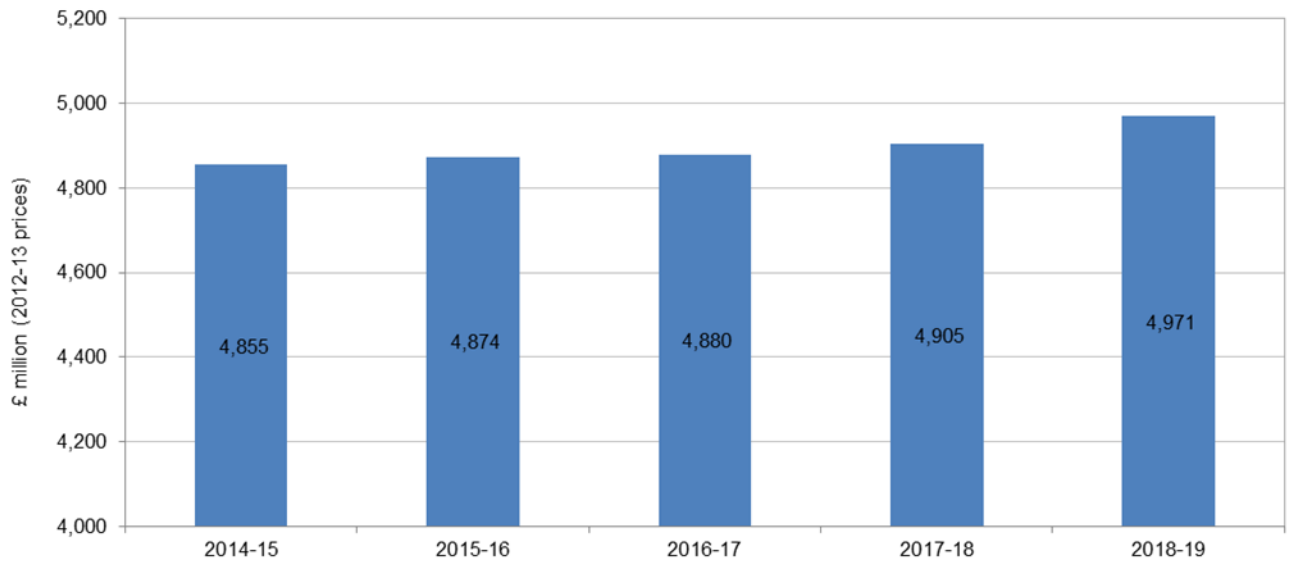


Table 14.5: Our assessment of Network Rail's CP5 expenditure for England & Wales

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Support costs	416	396	371	358	343	1,884
Network operations	385	374	358	344	325	1,787
Traction electricity, industry costs and rates	457	543	572	611	682	2,864
Network maintenance	983	961	931	898	871	4,644
Schedule 4 & 8 costs	199	208	208	194	194	1,003
Total operating expenditure	**2,440**	**2,482**	**2,439**	**2,405**	**2,415**	**12,182**
Renewals	2,211	2,264	2,202	2,122	2,042	10,840
Enhancements	2,251	2,426	2,401	2,340	1,415	10,833
Total capital expenditure	**4,462**	**4,690**	**4,603**	**4,461**	**3,457**	**21,673**
Total expenditure	**6,902**	**7,173**	**7,042**	**6,867**	**5,872**	**33,855**

Table 14.6: Our assessment of Network Rail's CP5 revenue requirement for England & Wales

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Total operating expenditure	2,440	2,482	2,439	2,405	2,415	12,182
Add: Long-run steady state amortisation (including non-capex amortisation)	1,748	1,748	1,748	1,748	1,748	8,739
Add: Regulatory tax allowance	3	3	3	3	3	17
Add: Opex memorandum account	22	22	22	22	22	111
Gross rev. req. before cost of capital	**4,214**	**4,256**	**4,213**	**4,179**	**4,188**	**21,048**
Add: Allowed return (real cost of capital)	1,817	1,919	2,023	2,123	2,199	10,081
Less: Real equity surplus	(901)	(962)	(967)	(956)	(926)	(4,712)
Adjusted allowed return	916	956	1,056	1,167	1,273	5,369
Gross rev. req. pre-sustainability adjustments	**5,129**	**5,212**	**5,269**	**5,346**	**5,461**	**26,417**
Add: Additional amortisation (sustainability adjustment)	420	420	420	420	420	2,101
Gross revenue requirement	**5,550**	**5,632**	**5,689**	**5,766**	**5,881**	**28,518**
Less: Other single till income	(694)	(759)	(810)	(861)	(910)	(4,034)
Net revenue requirement	**4,855**	**4,874**	**4,880**	**4,905**	**4,971**	**24,485**

Table 14.7: Our comparison of CP5 expenditure for England & Wales

£millions (2012-13 prices)	PR08	SBP	Determination
Support costs	3,736	2,023	1,884
Network operations		1,842	1,787
Traction electricity, industry costs and rates	1,996	3,414	2,864
Network maintenance	5,543	4,214	4,644
Schedule 4 & 8 costs	818	632	1,003
Total operating expenditure	**12,094**	**12,124**	**12,182**
Renewals	11,569	12,809	10,840
Enhancements	8,820	10,959	10,833
Total capital expenditure	**20,389**	**23,768**	**21,673**
Total expenditure	**32,483**	**35,893**	**33,855**

Table 14.8: Our comparison of CP5 revenue requirement in England & Wales

£millions (2012-13 prices)	PR08	SBP	Determination
Total operating expenditure	12,094	12,124	12,182
Add: Long-run steady state amortisation (including non-capex amortisation)	7,841	9,385	8,739
Add: Regulatory tax allowance	-	-	17
Add: Opex memorandum account	-	133	111
Gross rev. req. before cost of capital	**19,934**	**21,642**	**21,048**
Add: Allowed return (real cost of capital)	9,411	11,730	10,081
Less: Real equity surplus	-	(4,210)	(4,712)
Adjusted allowed return	9,411	7,520	5,369
Gross rev. req. pre-sustainability adjustments	**29,345**	**29,162**	**26,417**
Add: Additional amortisation (sustainability adjustment)	-	815	2,101
Gross revenue requirement	**29,345**	**29,977**	**28,518**
Less: Other single till income	(3,241)	(3,858)	(4,034)
Net revenue requirement	**26,104**	**26,120**	**24,485**

Note: total amortisation for each scenario is as follows: PR08 (£7.8bn); SBP (£10.2bn); Determination (£10.8bn).

Scotland

14.6 The net revenue requirement is £164m lower than Network Rail's forecast in its SBP, largely because our assumption on Network Rail's adjusted allowed return is £238m lower than Network Rail's as we are assuming lower financing costs in CP5 and our other single till income assumption is £8m higher as we are assuming more property income, reducing the revenue requirement. This is offset by our total amortisation assumption being £23m higher than Network Rail's as we have made a larger adjustment for financial sustainability than Network Rail did. In addition the operating expenditure per the determination is £58m higher. The differences in operating expenditure, financing costs, amortisation and other single till income between our determination and the SBP are further explained in the impact of financial framework on financial parameters chapter (chapter 13) and other single till income chapter (chapter 18).

Figure 14.3: Our assessment of Network Rail's CP5 revenue requirement for Scotland

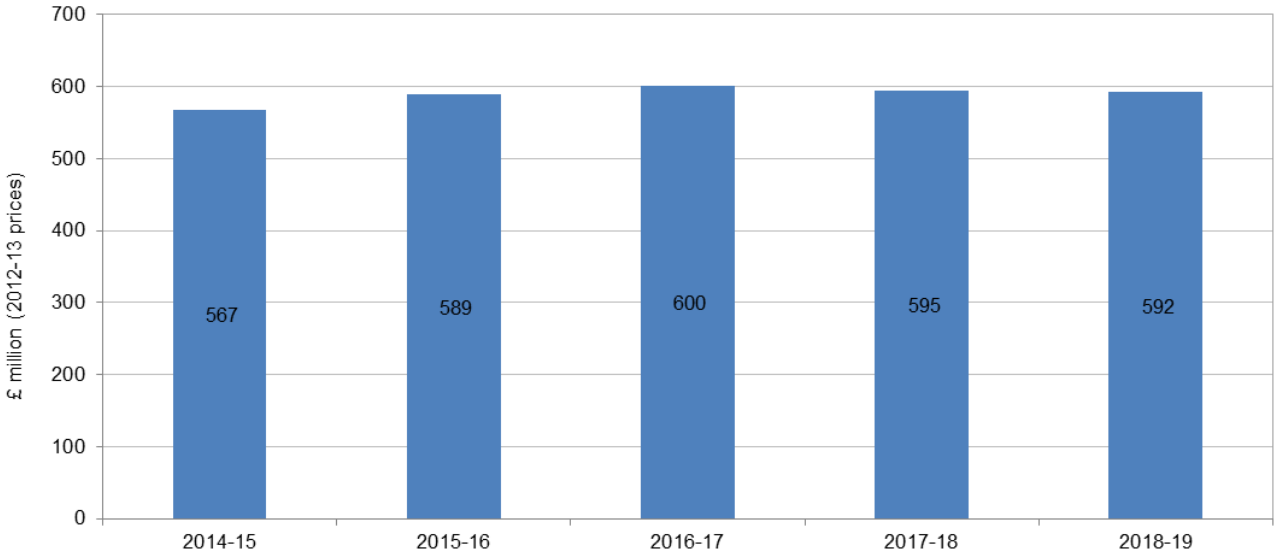


Table 14.9: Our assessment of Network Rail's CP5 expenditure for Scotland

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Support costs	46	44	41	40	38	209
Network operations	39	38	37	34	33	181
Traction electricity, industry costs and rates	41	49	51	53	57	250
Network maintenance	103	109	104	100	92	508
Schedule 4 & 8 costs	22	26	32	24	23	128
Total operating expenditure	**251**	**266**	**264**	**250**	**243**	**1,275**
Renewals	264	322	274	244	230	1,333
Enhancements	448	413	306	160	79	1,406
Total capital expenditure	**712**	**735**	**579**	**404**	**310**	**2,739**
Total expenditure	**963**	**1,001**	**843**	**654**	**553**	**4,014**

Table 14.10: Our assessment of Network Rail's CP5 revenue requirement in Scotland

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Total operating expenditure	251	266	264	250	243	1,275
Add: Long-run steady state amortisation (including non-capex amortisation)	211	211	211	211	211	1,055
Add: Regulatory tax allowance	0	0	0	0	0	1
Add: Opex memorandum account	1	1	1	1	1	4
Gross rev. req. before cost of capital	**464**	**478**	**476**	**462**	**455**	**2,335**
Add: Allowed return (real cost of capital)	207	227	243	253	256	1,187
Less: Real equity surplus	(107)	(116)	(117)	(116)	(112)	(568)
Adjusted allowed return	100	110	126	137	145	618
Gross rev. req. pre-sustainability adjustments	**564**	**588**	**602**	**600**	**600**	**2,954**
Add: Additional amortisation (sustainability adjustment)	56	56	56	56	56	278
Gross revenue requirement	**619**	**644**	**658**	**655**	**656**	**3,231**
Less: Other single till income	(52)	(55)	(57)	(60)	(63)	(288)
Net revenue requirement	**567**	**589**	**600**	**595**	**592**	**2,944**

Table 14.11: Our comparison of CP5 expenditure in Scotland

£millions (2012-13 prices)	PR08	SBP	Determination
Support costs	377	211	209
Network operations		185	181
Traction electricity, industry costs and rates	178	287	250
Network maintenance	583	455	508
Schedule 4 & 8 costs	52	80	128
Total operating expenditure	**1,190**	**1,217**	**1,275**
Renewals	1,572	1,555	1,333
Enhancements	477	1,430	1,406
Total capital expenditure	**2,048**	**2,985**	**2,739**
Total expenditure	**3,238**	**4,202**	**4,014**

Table 14.12: Our comparison of CP5 revenue requirement in Scotland

£millions (2012-13 prices)	PR08	SBP	Determination
Total operating expenditure	1,190	1,217	1,275
Add: Long-run steady state amortisation (including non-capex amortisation)	1,063	1,156	1,055
Add: Regulatory tax allowance	-	0	1
Add: Opex memorandum account	-	5	4
Gross rev. req. before cost of capital	**2,252**	**2,378**	**2,335**
Add: Allowed return (real cost of capital)	1,044	1,362	1,187
Less: Real equity surplus	-	(507)	(568)
Adjusted allowed return	1,044	856	618
Gross rev. req. pre-sustainability adjustments	**3,296**	**3,233**	**2,954**
Add: Additional amortisation (sustainability adjustment)	-	154	278
Gross revenue requirement	**3,296**	**3,388**	**3,231**
Less: Other single till income	(283)	(280)	(288)
Net revenue requirement	**3,014**	**3,108**	**2,944**

Note: total amortisation for each scenario is as follows: PR08 (£1.0bn); SBP (£1.3bn); Determination (£1.3bn).

15. Overall Incentives

Key messages in this chapter

- Incentivising efficient behaviour is at the core of PR13. We are putting in place substantial improvements to our package of incentives which comprise charges, financial and contractual incentives. These incentives impact not just on Network Rail but the whole industry.
- We are improving the variable usage charge so that it better reflects the extent to which use of different vehicles drives cost; ensuring that Network Rail bears more of the cost of traction electricity transmission losses which it can manage and establishing a new 'freight specific charge' so that a greater proportion of the costs that freight generates are recovered from haulage of commodities that can bear such an increase – electricity supply industry coal, spent nuclear fuel, and iron ore.
- Improvements to financial incentives include a new regional efficiency benefit sharing mechanism to encourage Network Rail and train operators to work together to reduce costs, and strengthening the volume incentive to encourage Network Rail to act more commercially in deciding how to encourage extra traffic.
- We are updating Schedules 4 and 8 payment rates and Schedule 8 benchmarks so they act as effective compensation and incentive regimes, to reduce disruption to passengers and freight customers.

Introduction

15.1 Many elements of our PR13 proposals have incentive properties and there has been discussion of incentives in previous chapters relating to outputs, expenditure and financing. But our core incentives package comprises charges and financial and contractual incentives.

15.2 The next chapter, chapter 16, covers access charges. But part of Network Rail's revenue requirement is provided by network grant in lieu of access charges – this is discussed in chapter 17. Other single till income is netted off of gross revenue to calculate the net revenue requirement and this is discussed in chapter 18. Chapters 19 and 20 consider financial and contractual incentives.

15.3 This chapter briefly describes the purpose of incentives and why regulatory intervention is required. It then describes the main types of incentives which we use to incentivise efficient behaviours both in Network Rail and more widely in the industry.

Purpose of incentives

15.4 Most markets and industries respond to incentives that result from the normal operation of the market. But in the rail sector, as with other monopoly network industries, there is the potential for 'market failure' arising from:

(a) **market power** – Network Rail is the provider of access to the mainline rail network and any company with such a monopoly or market power has an incentive to price higher than a competitive industry would and to provide less output which may be of a lower quality than that which would be provided in a competitive market; and

(b) **network externalities** – infrastructure networks, including the rail network, are complex and individual companies' use of them is likely to impose costs or benefits on other users. These impacts on third parties are known as external costs or benefits. Even if this were not the case, it is unlikely that the complexities of arranging use of the network could be resolved entirely through bilateral arrangements between operating companies and Network Rail. There are likely also to be other external costs or benefits, such as congestion, pollution or accidents, to third parties other than the rail industry and its customers.

15.5 Regulatory intervention is often considered to be required to address these market failures. In the rail industry this intervention takes the form of the implementation of regulatory incentive mechanisms which include charges, financial and contractual incentives.

Types of incentives

Charges

15.6 The standard regulatory response to market power is to control the company's prices so that overall revenues are not set above total costs. It may also involve specifying the quantity and quality of its output. These principles underlie our approach to establishing our PR13 determination.

15.7 Regulation attempts to ensure that unit prices are set at the marginal cost[254] of providing the unit of output. These cost-reflective prices incentivise efficiency by encouraging customers to purchase output if and only if the value of it to them exceeds the cost and by encouraging Network Rail to provide the product if and only if the value to customers exceeds the cost[255]. This principle underlies our consideration of access charges in the chapters which follow.

15.8 The principle of cost-reflective pricing may result in total revenue that differs from total costs. Indeed, the sum of revenues from Network Rail's present variable access charges falls far short of its total revenue requirement because it incurs a large proportion of fixed and common costs regardless of how much traffic runs on its network. In Network Rail's case, the difference between variable charges and its total revenue requirement is met by a combination of network grants from the governments and fixed access charges.

15.9 Charges can also be used to take account of costs and benefits that are external to the sector. These are losses and gains to third parties that are not necessarily taken into account by the industry or its customers unless an incentive is introduced to enable them to do so. Examples relevant to the rail industry include the relief of congestion on the road, environmental pollution, and the encouragement of innovation, research and development.

15.10 Environmental issues are an important feature of our duties. Environmental costs may be included in the prices of inputs used in the industry. An example is that the electricity prices that determine train traction electricity charges include the cost of purchasing allowances under the EU emissions trading scheme.

Financial incentives

15.11 If its revenue is limited to be equal to what is necessary to recover its costs, a company that does not face competition no longer has an incentive to control costs and so a separate regulatory mechanism is necessary to give it one. The mechanism for Network Rail is that we incentivise it to outperform our determination, which will benefit customers and funders. The setting of outputs and revenue and the process of

[254] Marginal cost is the increment to cost that results from producing an additional unit of output.

[255] This sort of efficiency, concerned with producing the right thing, is known as 'allocative efficiency' and is distinguished from 'productive efficiency' or producing at least cost.

incentivising cost performance have been discussed at length in earlier parts of this determination but one aspect, the regional efficiency benefit sharing mechanism, represents a new financial incentive for CP5, described in the financial incentives chapter (chapter 19).

15.12 Network Rail's unit charges do not cover all the costs of providing capacity and so we need to consider how it responds to requests for extra capacity. In a more commercial setting, Network Rail would charge prices which are set above its short run costs so that it would profit by selling more of what its customers wanted i.e. the use of network capacity. In the case of Network Rail, it also faces incentives in relation to train service punctuality outputs and so it may actually face a disincentive to make additional capacity available. So there is an existing volume incentive mechanism which is designed to encourage Network Rail to make trade-offs when deciding whether to meet unexpected demand similar to those which a company operating in a more commercial setting would make. We are improving the volume incentive for CP5, and this is described in full later in the financial incentives chapter (chapter 19).

Contractual incentives

15.13 There are well established mechanisms through which important aspects of network management are undertaken through contractual incentives. These take the form of administered charges set to reflect the external costs caused to other units of the network. The possessions and performance regimes chapter (chapter 20) discusses:

(a) the incentives in the 'Schedule 4' possessions regime through which compensation is paid to operators when they are unable to use parts of the network, due to planned restrictions of use, typically because engineering work is being carried out; and

(b) the incentives in the 'Schedule 8' performance regime through which operators are compensated for the costs of delay and cancellations imposed by others, including Network Rail.

15.14 The charges chapter discusses the 'capacity charge' which is levied on train operating companies to compensate Network Rail for the additional Schedule 8 delay payments it is expected to have to make to other operating companies as a result of the additional congestion caused by additional traffic.

16. Access charges

Key messages in this chapter

- This chapter is our draft determination with respect to track access charges and regulated station charges.
- It is our role to set the framework within which Network Rail has responsibility for calculating its track access charges. It has undertaken a major programme of work with extensive consultation and industry engagement.
- In setting the framework for charges, we are seeking to improve the extent to which charges reflect costs. In 2011-12 freight accounted for around 7% of all train km and around 25% of all gross tonne km moved on the network. But in CP4 Network Rail received less than 1% of its revenue from freight. Freight access charges currently cover less than 30% of the costs associated with freight; other users and taxpayers make up the difference.
- The industry currently receives around £4bn per year of public subsidy (most of this payment directly from government in lieu of fixed track access charges that would otherwise be paid by TOCs). By ensuring that a greater proportion of Network Rail's costs are recovered through charges, we could reduce the company's reliance on public funding.
- By making charges more cost reflective we will improve incentives for Network Rail to manage provision of network capacity more efficiently, and on its customers to use that capacity efficiently. It will also improve incentives on Network Rail's customers to work with Network Rail to reduce costs where they can.
- These efficiencies will further improve value for money for funders and users.
- The changes we are making to charges for CP5 are significant but not extensive. In particular we are: accepting new evidence on the variable usage charge so that it better reflects the extent to which use of different vehicles drives cost; ensuring that Network Rail bears more of the risk of traction electricity transmission losses, which it can manage; establishing a new ‘freight specific charge’ so that a greater proportion of the costs that freight generates are recovered from haulage of commodities that can bear such an increase – ESI coal, spent nuclear fuel, and iron ore.

Key messages in this chapter (continued)

- We recognise that changes to charges can significantly affect passenger and freight operators and their customers. In reaching our decisions we have had extensive discussions with stakeholders, have considered these impacts and have taken pragmatic steps to mitigate them.
- For example, our new freight specific charge is at a much lower level than the cap we set in January and will be phased in more gradually – not coming in until 2016 and rising gradually in CP5 to reach only 50% of what would have been its final level if we had fully implemented the charge on the basis of latest cost estimates.
- Further, we have decided not to impose the freight specific charge on biomass in CP5.
- We have concluded that we will not implement the recalibrated capacity charges as part of PR13. We will instead either implement the alternative proposal put forward by freight operators (possibly applying it also to open access passenger operators and/or franchise passenger operators, having regard to their views on this), or approve capacity charge rates that have been calculated using the methodology established in CP4, uprated for inflation.
- We have also concluded on imposing a cap on the increase in the average VUC for freight that is significantly below that which we set in January 2013, and which will be phased in. Passenger services do not face substantial increases in charges, and we have concluded that cost reflective VUC can be implemented for all passenger services from the start of CP5 in full. In our view, it would be beneficial for new franchises to expose TOCs to changes in charges, strengthening their incentives to work with Network Rail to reduce its costs.
- We estimate that average total franchise passenger variable charges and open access charges will each increase by 1% from CP4 to CP5 in real terms, and with consistent levels of traffic and electricity prices.
- We estimate that average total freight charges will increase by 21% from CP4 to the end of CP5 (or 9% from CP4 to the CP5 average), in real terms and with consistent levels of traffic and electricity prices. This equates to an increase in charges of 4% per year, real, in each year of the period.
- All these charges are lower than they would have been without our efficiency challenge to Network Rail, which has resulted in a reduction in some charges of 9% compared to Network Rail's draft price lists.

Key messages in this chapter (continued)

- We will shortly consult on options to allow passenger open access operators greater access to the network in return for some contribution to fixed costs.
- We will do more work in the early part of CP5 to improve our understanding of costs and consider how they might be better reflected in charges (including the capacity charge). We will work with the industry, and also with passenger groups and freight customers, as appropriate, in conducting this review.
- Network Rail will reissue its draft price lists, consistent with our draft determination, on or before 12 July 2013.

Introduction

16.1 In this chapter we conclude on the access charges paid by Network Rail's customers that are within the scope of PR13[256]. They include:

(a) track access charges paid by franchised passenger train operators, open access passenger train operators and charter passenger train operators;

(b) track access charges paid by freight train operators; and

(c) station long term charges paid by the users of franchised stations and the 17 Network Rail 'managed' stations.

16.2 It is important that Network Rail's charges truly reflect the costs they are designed to recover. In this way, charges provide the best possible signals to Network Rail and to its customers about the provision and use of infrastructure services. This in turn drives efficient use of resources, both in terms of existing infrastructure and the provision of new capacity, and incentives to reduce costs where possible.

16.3 In PR13, Network Rail has undertaken a thorough review of the costs which the charges are set to recover, and on that basis calculated the implied charges. We have largely held the structure of charges constant, with two exceptions:

[256] Access charges not within the scope of PR13 are those in access contracts either exempt from regulation (such as the non-stopping Paddington to Heathrow services operated by Heathrow Express) or those that do not contain a contractual reopener permitting a periodic review by ORR of the charges (such as depot access agreements and connection contracts).

16.4 The first is the introduction of a new freight specific charge on certain commodities. In CP4, freight accounted for around 7% of all train kms and 24% of gross tonne kilometres on the network, generating costs of roughly £280m per year. And yet less than 1% of Network Rail's revenue comes from rail freight. While we recognise that there are good reasons for subsidising rail freight, there are some parts of the rail freight sector that could make a greater contribution to the costs they impose on the network. This charge represents a small increase in their contribution and a greater exposure to the costs they generate.

16.5 The second is a set of changes relating to the treatment of the costs of electricity for traction, in particular relating to incentives for on-train metering and for Network Rail to manage electricity transmission losses. These changes will increase Network Rail's exposure to the costs associated with transmission losses, improving incentives to reduce these losses, increasing efficiency and benefitting the environment.

16.6 Furthermore, where Network Rail has provided better evidence in relation to cost drivers, we are implementing changes to existing charges in a way that broadly reflects the relative importance of different factors in driving cost. This will result, for example, in different relativities between the different variable usage charges for different vehicle types.

16.7 By increasing the extent to which Network Rail's charges reflect cost in this way, we improve incentives for efficiency, improve value for money for users and funders, and reduce the reliance of the railway on public subsidy, which is currently running at more than £4bn per year.

16.8 In relation to all these changes and having regard to our statutory duties, we have taken account of the impact, not only on passenger and freight operators but also on their customers. Where appropriate, for example in relation to the freight specific charge, this has caused us to mitigate their impacts, for example by phasing in over a longer period.

16.9 Following PR13, we will conduct an extensive review of the structure of charges in the early stages of CP5 with a view to improving cost reflectivity[257]. Our aim in undertaking this work is to get a better understanding of infrastructure costs and their

[257] We set this out in *Volume incentive consultation*, ORR, December 2012, http://www.rail-reg.gov.uk/pr13/consultations/volume-incentive.php.

drivers, and to identify scope for charges to send better signals for efficient provision and use of network capacity, and for more efficient cost recovery, ultimately improving value for money. We are keen that the work should look at the balance between recovery of costs from network grant, fixed charges and variable charges. Recognising the potential significance of this review for Network Rail, its customers and their customers we intend to work with the industry on it, for example involving the RDG Contractual and Regulatory Reform sub-group.

16.10 This chapter is structured as follows:

(a) background to the access charges framework;

(b) brief overview of the level of charges in CP4;

(c) description of our general approach to assessing Network Rail's charging proposals;

(d) description of how we have taken account of our decisions for efficiency in determining the level of charges;

(e) the method of calculation and charge levels for each of the charges for 'costs directly incurred':

(i) variable usage charge (VUC);

(ii) capacity charge;

(iii) coal spillage charge;

(iv) traction electricity charge; and

(v) electrification asset usage charge (EAUC);

(f) the method of calculation and charge levels for the 'mark-up' which is levied on certain types of freight traffic (in addition to charges for costs directly incurred), via:

(i) the freight only line (FOL) charge; and

(ii) freight specific charge (FSC);

(g) the method of calculation and levels of the fixed track access charges (FTAC) payable by franchised passenger operators;

(h) the method of calculation and charge levels for station long term charge (LTC);

(i) our consultation on charges relating to on-rail competition between passenger services;

(j) issues specific to charter services;

(k) the role of traffic forecasts in these proposals;

(l) implementation issues;

(m) what our conclusions mean for different stakeholders:

(i) franchise passenger services;

(ii) freight services; and

(iii) open access services;

(n) next steps.

16.11 Consistent with the rest of this document, all values are in 2012-13 prices unless otherwise stated. In addition, costs and charges for CP5 are presented at end of CP5 levels of efficiency (which is the basis on which charges for CP5 will be levied) unless otherwise stated.

Background

16.12 Charges provide:

(a) Cost recovery: A mechanism for Network Rail to recover the efficient costs it incurs in providing track and station infrastructure used by train operators;

(b) Signals for efficiency of use: Users make better use of products, including capacity, by responding to signals sent through prices based on cost. Charges provide signals to train operators, their suppliers and funders for the efficient use and development of vehicles and the infrastructure;

(c) Signals for cost efficiency and allocation: Charges allow costs to be allocated. Where charges allocate costs to those who have caused them to be incurred they provide an incentive to reduce those costs; and

(d) Signals for efficient provision of goods and services: Charges send signals to providers as to the goods and services they should provide. In this case, charges could provide an incentive to Network Rail to respond to signals sent by users through prices and their consumption decisions about what they are willing to

pay for and what Network Rail should therefore provide (as long as those charges cover the cost of provision).

16.13 Charges are therefore an important means through which information and incentives can be provided to encourage improvements in efficiency, and therefore the value for money provided by the railway. Where charges are not cost-reflective, the incentives on both providers and users of the infrastructure to act commercially are weakened.

16.14 Under the charging principles set out in EU legislation, transposed into the Railway Infrastructure (Access and Management) Regulations 2005, the track access charges that each operator pays are calculated to reflect the costs that Network Rail incurs as a result of allowing that operator's services to operate on the network. These costs include wear and tear of Network Rail's assets, and also those Schedule 8 costs that vary with traffic that Network Rail recovers through the capacity charge.

16.15 Exceptions to these charging principles are permitted in certain narrowly defined circumstances. One such exception is that of a mark-up, where the charge is above that of the costs directly incurred, which is permitted so that a greater proportion of Network Rail's costs are recovered through charges, provided that certain principles are adhered to, including that the charge does not price market segments off the network. Some freight services have paid mark-ups in CP4, and we are extending this in CP5 so that those freight services that can bear a mark-up because they do not compete with road make a greater contribution to the costs they impose on the infrastructure.

16.16 Station facility owners pay regulated station long term charges to Network Rail to enable it to recover the costs of maintaining, renewing and repairing its stations.

16.17 The FTAC recovers Network Rail's net revenue requirement. This is calculated as Network Rail's total revenue requirement net of Network Rail's variable track access charges, Network Rail's regulated station charges, network grant and other single till income[258]. FTAC is paid by franchised passenger operators only and is determined as an annual charge rather than a charge per unit of traffic.

[258] Network grant and other single till income are covered in other chapters.

Charges in CP4

16.18 As Table 16.1 shows, in 2011-12, around 90% of Network Rail's income came from those charges paid by passenger and freight operators and grant income (in lieu of FTAC that would otherwise have been paid by franchised passenger TOCs) determined as part of PR08. Around 78% came from grant income and FTAC alone, i.e. not varying according to volume

16.19 Of the variable charges, for passenger services the three charges accruing the most income in CP4 have been the VUC, the capacity charge and the charge for using EC4T. In contrast, for freight services, around 70% of income has accrued from the VUC. This is because proportionately fewer freight services use EC4T, and because of the lower capacity charge for freight reflecting, for example, freight services' use of the network at less congested times than passenger services.

Table 16.1: Network Rail Great Britain-wide income from regulated charges and grants 2011-12

(£ million, 2012-13 prices)

Charge	Franchise passenger operators	Freight operators	Open access passenger operators	Total, passenger and freight operators
VUC	154	49	3	207
EAUC	9	0	0	9
Coal spillage charge	0	2	0	2
Freight-only line charge	0	4	0	4
Traction electricity charge	206	5	3	214
Capacity charge	174	4	1	179
Total variable charges	**544**	**64**	**7**	**614**
FTAC	913	0		913
Grant income	4,108			4,108
FTAC and grant income	**5,021**			**5,021**
Station long term charge	145	0	1	146

Charge	Franchise passenger operators	Freight operators	Open access passenger operators	Total, passenger and freight operators
Total regulated charges and grant income	**5,710**	**64**	**7**	**5,781**
Total Network Rail income (includes other single till income)	**6,464**			

Notes:

1. Source: ORR analysis of Network Rail Regulatory Accounts
2. Traction electricity income from open access operators includes that from Heathrow Express and other operators not subject to other regulated variable charges.
3. Numbers may not reconcile due to rounding.

16.20 Table 16.2 lists each of the regulated access charges levied by Network Rail in CP4. The table also shows the units on which each charge is levied, for example kgtm means the charge is levied in terms of pounds or pence per thousand gross tonne mile (kgtm). With the exception of FTAC, the track access charges are not disaggregated geographically, in that the charges for a particular vehicle type, service group and commodity do not vary according to what section of route they are travelling on.

Table 16.2: Regulated access charges in CP4

Type of charge	Basis for charge	Payable in CP4 by	Unit on which charge has been levied
Charges for costs directly incurred			
VUC	Recovers maintenance and renewal costs that vary with traffic	All services	kgtm (freight) Vehicle mile (passenger)
Capacity charge	Recovers Network Rail's Schedule 8 costs that vary with traffic	All franchise passenger, open access passenger and freight services (charter do not currently pay the capacity charge)	Train mile
Coal spillage charge	Recovers the costs of coal spillage	Services that transport coal	kgtm

Type of charge	Basis for charge	Payable in CP4 by	Unit on which charge has been levied
Traction electricity charge	Recovers the costs of providing electricity for traction purposes	Electrically powered services	kWh. For services that are not metered, this is modelled per train mile for multiple units, otherwise per kgtm
Electrification asset usage charge (EAUC)	Recovers maintenance and renewal costs of electrification assets that vary with traffic	Electrically powered services	Vehicle mile (passenger) kgtm (freight)
Mark-ups			
Freight only line (FOL) charge	Recovers the fixed costs of FOLs	Services that transport electricity supply industry coal and spent nuclear fuel	kgtm
Other			
Station long term charge (LTC)	Recovers station building and civils maintenance, repair and renewal costs	Station facilities owner (who levy on services that call at stations)	Billing period
FTAC	Determined on basis of Network Rail's revenue requirement after accounting for the income received from variable track access charges, regulated station charges, other single till income and network grants.	Franchised passenger operators	Billing period

Process for determining the level of charges for CP5

16.21 Network Rail has responsibility for developing charging proposals in line with our charging objectives and guidance, which we set out in annex F of our first consultation[259]. We retain responsibility for the charging framework, i.e. for any

[259] *Our Periodic Review 2013 First Consultation Annexes*, published in May 2011, can be accessed at http://www.rail-reg.gov.uk/pr13/PDF/PR13-first-consultation-annexes.pdf.

changes to policy including the development of new charge proposals, and we also audit and approve the charges that Network Rail has calculated.

16.22 Network Rail has conducted its work calculating track access charges with a high degree of industry engagement. Network Rail has consulted and then concluded on all of its charges, and published its work. For all charges it has engaged closely with the industry throughout PR13. And it has held working groups with respect to particular technical issues, notably with respect to the methodology for allocating variable usage costs to individual vehicles and commodities, and with respect to the capacity charge.

16.23 We have reviewed Network Rail's work and its treatment of points made in response to its consultations. In addition, we have asked the independent reporters to review some of Network Rail's proposals as part of our scrutiny process.

16.24 Table 16.3 lists reports published as part of this process. Network Rail's publications on charges can be found via its PR13 web page[260].

Table 16.3: PR13 Network Rail consultations, studies and reviews on charges

Category of cost or charge	Network Rail consultation	Network Rail conclusions	Network Rail consultancy studies	Independent reporter reviews
1) Variable usage charge (VUC)				
VUC initial cost estimates and freight caps	November 2011	March 2012	N/A	Review of analysis in Network Rail's 'freight cap' consultation, by Arup, March 2012
Suspension factors	March 2012	August 2012	Various including RFCpro User Guide, University of Huddersfield, November 2012	N/A

[260] Network Rail's PR13 web page is at http://www.networkrail.co.uk/publications/delivery-plans/control-period-5/periodic-review-2013/ Network Rail's PR13 closed consultations can be accessed at http://www.networkrail.co.uk/publications/delivery-plans/control-period-5/periodic-review-2013/pr13-closed-consultations/

Category of cost or charge	Network Rail consultation	Network Rail conclusions	Network Rail consultancy studies	Independent reporter reviews
Allocation of the VUC to individual vehicles and commodities	December 2012	April 2013	VTISM[261] analysis to inform the allocation of variable usage costs to individual vehicles, by Serco, December 2012	ORR staff conducted a review
2) Capacity charge				
	July 2012	September 2012 Preliminary conclusions	N/A	N/A
		April 2013 capacity charge conclusions and draft pricelists	Recalibrating the capacity charge for CP5, Arup, May 2013	N/A
3) Traction electricity charge				
Consultation on traction electricity charge and EAUCs in CP5	September 2012	February 2013	N/A	1. EC4T transmission losses estimates review, AMCL, December 2012. 2. EC4T SBP model audit report, by Arup, June 2013
Consultation on charges for losses and regenerative braking for metered operators on the DC network	November 2012	February 2013	N/A	
4) EAUC	September 2012	February 2013 and amended June 2013	N/A	Assessment of EAUC Proposals, by AMCL, June 2013
5) Coal spillage charge	December 2012	April 2013 Addendum – not published at time of writing.	N/A	Review of Network Rail's coal spillage charge, by Arup, April 2013
6) Freight only line charge				

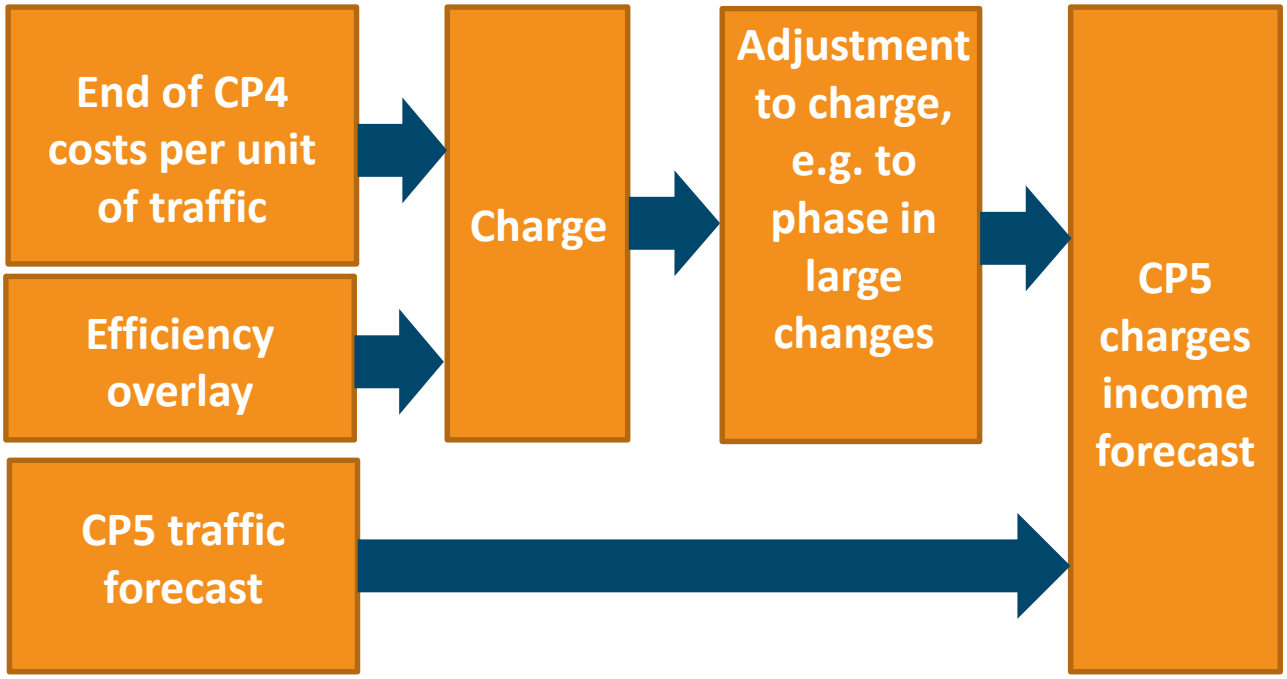
[261] Vehicle Track Interaction Strategic Model, discussed in the section on the VUC.

Category of cost or charge	Network Rail consultation	Network Rail conclusions	Network Rail consultancy studies	Independent reporter reviews
Freight only line charge initial cost estimates (part of Network Rail's consultation on freight caps)	November 2011	March 2012		Review of analysis in Network Rail's 'freight cap' consultation, by Arup, March 2012
Part of a wider consultation focusing on phasing in the freight specific charge	February 2013	April 2013	Estimating freight avoidable costs, by L.E.K, October 2012	
7) Freight specific charge				
	ORR consultation May 2012	ORR conclusions January 2013	Estimating freight avoidable costs, by L.E.K, October 2012	Review of VTISM modelling, Arup, November 2012
Phasing in of the charge and other issues	February 2013	April 2013		
8) FTAC	November 2012	March 2013	N/A	N/A
9) Station LTC	September 2012	January 2013	N/A	Various reporter studies on station costs (refer to relevant chapters).

16.25 In addition to the work undertaken by Network Rail, we have developed two main changes to the charging framework: the introduction of a freight specific charge; and amendments to the traction electricity charge. These are also listed in the above table.

16.26 Figure 16.1 shows how Network Rail's income from charges is calculated, in both the SBP and in our determination. The charge is calculated as a cost per unit of traffic to which an efficiency overlay is applied, so that the charge is equivalent to costs at end-CP5 efficiency. The income is calculated by taking the product of individual charges and their respective traffic forecasts for CP5. These calculations are made in constant prices (2012-13 prices) so do not take account of inflation.

Figure 16.1: Calculation of CP5 income for each charge



16.27 Before setting out our determination with respect to each individual charge, we first explain the efficiency overlays that we have used.

Treatment of efficiency in the estimation of charges

16.28 It is very important that Network Rail manages its assets effectively and efficiently. The decisions we have taken on efficiency for Network Rail's maintenance and renewals expenditure, as described in Chapter 8, are to be reflected in the level of charges that operators pay since charges are set to be cost reflective.

16.29 In determining our approach for CP5, consistent with the wider decisions described in Chapter 8, we have considered the efficiency overlay that should be applied to each charge. This overlay reduces the cost, calculated on the basis of end-of-CP4 costs, by the gains in efficiency we assume in our determination over the relevant period.

16.30 This section describes[262]:

(a) our approach to applying an efficiency overlay to charges in CP4;

[262] Refer to chapter 8 for further information on our decisions on efficiency for both maintenance and renewals expenditure. Chapter 8 further describes the treatment of embedded efficiencies and the methodology we have adopted in making adjustments to Network Rail's baseline.

(b) Network Rail's proposed approach to efficiency and charges in CP5;

(c) our assessment of Network Rail's CP5 proposed approach; and

(d) our determination of the approach to applying an efficiency overlay for each charge in CP5.

Treatment of efficiency in charges for CP4

16.31 In PR08 charges for each year of CP4 were calculated using our determination of long-term efficiency as an overlay. This reflected our assessment of efficiency improvement in CP4 and the further catch-up efficiency estimated for CP5. The VUC, coal spillage charge and EAUC were calculated on this basis.

16.32 The approach taken for the FOL charge was slightly different in that the charge (for the whole of CP4) was adjusted by an overlay that reflected end-of-CP4 efficiency only. This reflected the fact that the charge, distinct from other variable charges, was a mark-up, levied in order to recover some portion of fixed cost.

16.33 An efficiency overlay was not applied to Schedule 8 (performance regime) payment rates, as they are determined with reference to the financial impact of performance on train operators' revenue, and hence was not applied to the capacity charge either. No efficiency overlay was applied to traction electricity in CP4 as it was regarded as a 'non-controllable' cost.

Treatment of efficiency overlay for charges in SBP

16.34 In its SBP, Network Rail calculated charges income on the basis of end of CP5 efficiency overlay. Network Rail's approach in its SBP was to use the combined operations, maintenance and renewals end of CP5 efficiency forecast of 16% to reduce the VUC, the coal spillage charge and the FOL charge by 16%. However, following the submission of its SBP, Network Rail advised us that it had applied the *combined* operations, maintenance and renewals end of CP5 efficiency overlay in error when its intention was to apply a *weighted average* maintenance and renewals efficiency overlay, consistent with the approach in CP4. The weighted average maintenance and renewals efficiency overlay was 15%, one percentage point lower than the combined operations, maintenance and renewals efficiency figure.

16.35 For the largest element of the station long term charge, Network Rail applied a 16.1% adjustment on the same basis. However, it has since advised us that 16.6% should be used on the basis of its view of end of CP5 efficiency for station buildings renewals.

16.36 In its SBP, Network Rail calculated the income it would receive from the electrification asset usage charge (EAUC) using an efficiency adjustment of 18.3%, reflecting its view of end of CP5 efficiency for electrical power and fixed plant (renewals).

16.37 Table 16.4 shows Network Rail's efficiency proposals for its charges.

Table 16.4: Network Rail's proposed efficiency overlays for CP5 charges

Charge	Network Rail SBP efficiency overlay	Network Rail subsequent efficiency overlay
VUC	16.0%	15.0%
EAUC	18.3%	18.3%
Coal spillage charge	16.0%	15.0%
Station LTC – buildings expenditure	16.1%	16.6%
Station LTC – Stations Information and Security Systems (SISS) expenditure	15.0%	15.0%
FOL charge	16.0%	15.0%

Our treatment of the efficiency overlay for charges

16.38 Chapter 8 sets out our analysis of efficiencies available in CP5.

16.39 In determining our view of the level of income by charge, we have first calculated Network Rail's pre-efficient level of income (the "Network Rail baseline") by removing the efficiency assumed in its SBP and the efficiencies associated with Network Rail's CP5 asset policies. We have then made certain adjustments to Network Rail's baseline, consistent with our adjustments to pre-efficient expenditure (as set out in chapter 8). We then apply our view of efficiency for CP5.

16.40 We have applied our end of CP5 efficiency assumption to charges. We think that it is important that the charges are adjusted for efficiency in a way that is cost reflective. Table 16.5 shows our view of the end of CP5 level of efficiency that should be applied to each charge, on the basis of our comprehensive review of the evidence. These efficiencies are applied in each year of CP5.

Table 16.5: Our determination of efficiency overlays for CP5 charges[263]

Charge	ORR adjustment to pre-efficient expenditure	ORR efficiency overlay	Efficiency type
VUC (where not capped)	-4.4%	19.1%	weighted maintenance and renewals
EAUC	+8%	29.5%	electrical power and fixed plant maintenance and renewal
Coal spillage charge	-4.4%	19.1%	weighted maintenance and renewals
Station LTC – buildings expenditure	0% for managed stations and -6.3% to -13.6% for franchised stations	19.2% for managed stations and 23.3% for franchised stations	buildings – managed and franchised stations
Station LTC – Stations Information and Security Systems (SISS) expenditure	0.3% to -13.2%	16.2%	SISS expenditure – managed and franchised stations
Freight only line charge/Freight specific charge (where not capped)	-4.4%	19.1%	weighted maintenance and renewals

Variable usage charge

16.41 The VUC is set to equal the operating, maintenance and renewal costs that vary with traffic. In CP4, the VUC made up more than 75% of Network Rail's track access charges income from rail freight , and around 30% of variable track access charges from passenger traffic

16.42 In practice, rail infrastructure operating costs are widely understood not to vary materially with traffic, and therefore the charge was set in CP4 to recover variable maintenance and renewal costs only. Network Rail has estimated that around 85% of these variable usage costs (i.e. the costs recovered through the VUC) consist of track

[263] These are applied so that , for example, the adjustment for the EAUC is an increase of 8% and then reduction of 29.5% (approximate net impact a reduction of 21.5%, but they are applied as a product rather than a sum).

wear and tear, with the remainder consisting of civil costs and signalling. The charge does not reflect the costs of providing or changing the capability or capacity of the network.

16.43 Not all costs that vary with traffic are recovered through the VUC. The VUC recovers costs that change with marginal changes in traffic, whereas some costs change with larger increments and are not recovered through standard variable charges (though may be recovered through mark-ups). Some costs relate to subsets of traffic. In particular, as we explain later, variable costs associated with electrification assets are charged only to electrified vehicles through the EAUC; and costs associated with coal spillage are recovered through the coal spillage charge, which is only levied on coal traffic. The capacity charge is necessarily a separate charge because it is levied per train mile, rather than per vehicle mile or kgtm, reflecting the costs associated with increased congestion on the network.

16.44 The VUC is differentiated by vehicle class. This differentiation reflects the significant variation in infrastructure wear and tear costs associated with different vehicle characteristics, for example vehicle operating speed and axle weight. In the case of freight, the charge is further disaggregated by commodity type, reflecting the different axle loads associated with different commodities. The rates are averaged across the network as a whole, resulting in a single Great Britain-wide price for each permutation of vehicle type and commodity.

16.45 We consulted on geographic disaggregation of the VUC, but decided as set out in our January 2013 conclusions document[264] not to pursue this approach for CP5, reflecting concerns raised by the industry about the complexity this could introduce and the extent to which this would undermine rail freight's ability to compete with road. We will include the question of how cost drivers vary with geography and how this should be reflected in charging in our wider review of the structure of charges in the initial part of CP5.

Calculating the charge in CP5

16.46 Network Rail has used broadly the same approach for calculating the VUC in PR13 as that used in PR08. As with PR08 its recalibration of the charge VUC has comprised two stages:

[264] http://www.rail-reg.gov.uk/pr13/consultations/freight-charges.php.

(a) estimating variable usage costs for an average vehicle; and

(b) apportioning total variable usage costs between individual vehicles (or vehicles and commodities in the case of freight).

16.47 The first stage has historically been referred to as calculating total variable usage costs, and indeed it is the basis on which revenue for the VUC can be forecast. It is, however a calculation of the costs associated with a small change in traffic, measured as a rate per gross tonne km (or mile)[265]. The rate is then multiplied by total traffic across the network. This calculation would result in a good estimate of total variable usage costs if the relationship between variable usage costs and traffic were linear, but research has suggested that this may not be the case. In particular, as part of work estimating freight avoidable costs, Network Rail has estimated that the total variable usage track costs associated with freight to be substantially more than the costs recovered through the VUC, i.e. that the VUC under-recovers freight's variable costs[266]. We consider this methodology for calculating the charge (i.e. calculating the costs for a small change in traffic) is consistent with the Access and Management Regulations which set the principles which must be followed when setting access charges. It is relevant, however, in respect to equivalent discussions relating to the capacity charge where some stakeholders have expressed concern that an over recovery of costs is occurring.

Estimating variable usage costs for the average vehicle

16.48 Network Rail estimated the costs for a small change in traffic for an average vehicle using broadly the same methodology as that which it used in PR08.

16.49 Network Rail used a 'bottom-up' approach to estimating track variable usage costs. In order to derive these bottom-up estimates, Network Rail used the Vehicle Track Interaction Strategic Model (VTISM), which was developed for the cross-industry

[265] Network Rail found its estimates of increases in costs per unit of traffic to be very similar irrespective of whether it tested a 10% or 20% increase in traffic, and it has estimated the costs on that basis.

[266] The reporter Arup reviewed this work (*(November 2012) Review of Network Rail VTISM modelling and allocation to market segments for Freight Avoidable Costs*), and concluded that the total variable usage track costs associated with freight would be in the range £144m to £210m a year 35 average traffic, in 2011-12 prices and end of CP4 efficiency, of which £70m may be recovered by the variable usage charge. L.E.K. has subsequently re-estimated so that, when we convert to end-CP5 efficiency and 2012-13 prices and adjust to 2013-14 traffic, amounts to £89m to £128mm a year for all variable usage costs (not just track), excluding the costs associated with the Serco research. This compared to freight revenue from the variable usage charge in CP4 of less than £50m a year (and a capacity charge of less than £5m a year).

Vehicle/Track Systems Interface Committee (V/T SIC). VTISM directly related rolling stock and track characteristics to track damage, and thus to renewal and heavy maintenance requirements. VTISM uses engineering principles, embodied in numerical relationships, to predict track degradation and the remedial effects of heavy maintenance and renewal.

16.50 Network Rail had calibrated VTISM for its asset policies over the next 35 years. It tested track costs under current traffic levels and under incremental uniform increases in traffic levels across the network. Network Rail equated the resulting difference in cost per unit of traffic to be the track variable usage costs for the average vehicle.

16.51 For other variable usage costs (amounting to around 14% of total variable usage costs), Network Rail has taken a "top-down" approach. In particular, it disaggregated civils and signalling costs into a number of cost categories and, using a mixture of empirical evidence and engineering judgement, estimated the percentage of each cost that varied with traffic.

16.52 Network Rail consulted on its work as part of its freight caps consultation in November 2011 and concluded in March 2012. The independent reporter Arup reviewed its work and made a number of recommendations. As a result of this, Network Rail refined some small aspects of its estimates and provided more evidence to us for the basis of its assumptions. This evidence is published on its website.

16.53 We concluded that we were content with its approach as part of our January 2013 conclusions on track access charges. On the basis of this work, in our January 2013 conclusions we set a cap on the average VUC for freight. Our January 2013 document, and our earlier May 2012 consultation on the same issue, set out the technical issues and sources of evidence in some detail[267].

16.54 Subsequent to our conclusion, Network Rail updated its estimates as part of its SBP (our cap was based on earlier unit cost data). Since then, Network Rail has made some minor changes to its methodology. In particular, it reduced the cost estimate to remove some items of cost that would have otherwise been doubly recovered through both this charge and the coal spillage charge.

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[267] *Our conclusion on the variable usage charge and on a freight-specific charge*, published January 2013, can be accessed at http://www.rail-reg.gov.uk/pr13/PDF/freight-conclusions-jan-2013.pdf.

Our January 2013 decision on capping the VUC

16.55 The rail freight industry asked us for early assurance of the scale of track access charges in CP5. We agreed that this was appropriate, noting the uncertainty to the industry associated with our consultation on a new freight charge (the freight specific charge). In particular, we agreed to set a cap on the average freight VUC and we committed to our PR13 determination resulting in the average charge at or below that cap.

16.56 In our January 2013 document[268] we concluded on a cap on the VUC of £1.68 per kgtkm in 2011-12 prices for freight services. This was 5% to 7% higher than the CP4 charge, before taking account of expected improvements to efficiency, and adding a 15% confidence interval to account for uncertainty. It represented a figure that we were confident the final average VUC would not exceed. We noted that it was possible that charges would be higher than they were in CP4, but they that would not exceed the cap that we set out in that document. Our conclusion was widely interpreted as meaning a 23% average increase in the freight VUC (product of 7% and 15% increase, allowing for rounding); this interpretation was a worst case scenario and took no account of our efficiency challenge for CP5[269].

Allocating costs to individual vehicles

16.57 Network Rail's cost estimates were then allocated between each vehicle operating on the network. The allocation was achieved, as was the case in PR08, based on the levels of damage caused by rail vehicles through vertical track forces, horizontal track forces, and damage to other rail infrastructure, in particular civils and signalling.

16.58 In early 2012 Network Rail established a working group of industry representatives to decide the scope of work for improving the methodology in this area. Collaborating with the industry group, it then prepared a specification for some of the work and appointed consultants to carry it out. The remainder of the work (in particular, relating to horizontal track forces) it carried out in-house.

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[268] *Our conclusion on the variable usage charge and on a freight-specific charge*, published January 2013, can be accessed at http://www.rail-reg.gov.uk/pr13/PDF/freight-conclusions-jan-2013.pdf.

[269] Both the CP4 and CP5 charge are being set on the basis of Network Rail's efficiency for end of CP5; but our determinations of what that might be, in PR08 and PR13 respectively, differ.

Allocating vertical track damage costs to individual vehicles

16.59 Network Rail appointed Serco Technical Services (Serco) to undertake a study using VTISM to inform the allocation of track damage from vehicle forecasts between individual vehicle classes and commodities on a national average basis. Track damage from vertical forces amounts to around 70% of all track variable usage costs. Network Rail also asked Serco to review the allocation of civils and signalling costs.

16.60 Serco proposed a revised approach for apportioning vertical track costs to individual vehicles. Serco's analysis showed that relative to Network Rail's PR08 allocation methodology, the track damage associated with vertical forces resulting from heavy axle loads was higher and that track was less sensitive to vehicle speed[270]. Network Rail estimated that applying this research would increase the VUC for certain laden freight wagons, particularly bulk wagons, between 50% and 100%.

16.61 Network Rail explained in its April 2013 conclusions on the allocation of the VUC[271] that it considered the work carried out by Serco was a robust piece of analysis that represents a step-change improvement in the understanding of the drivers of vertical track damage. However, it stated that "following careful consideration of consultation responses, we consider that changes to charges of this scale would be inappropriate to introduce in CP5. The primary reason for our conclusion in this regard is because of the combined effect that these price changes would have with ORR's new FSC…we are proposing that, as part of the wider charges review that the industry has committed to in early CP5 to inform CP6, the revised equivalent track damage equation developed by Serco should be adopted from the start of CP6."

Allocating horizontal track damage to individual vehicles

16.62 Network Rail estimated that horizontal track variable usage costs make up around 30% of total track variable usage costs. For CP5 Network Rail carried out work to update the CP4 methodology in order to improve the accuracy of the apportionment of horizontal track variable usage costs. Its revised approach incorporated a new damage calculation methodology and parameters.

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[270] Serco's VTISM analysis to inform the allocation of variable usage costs to individual vehicles, published in December 2012, can be accessed at http://www.networkrail.co.uk/WorkArea/DownloadAsset.aspx?id=30064784406.

[271] The Network Rail conclusions document is available at http://www.networkrail.co.uk/publications/delivery-plans/control-period-5/periodic-review-2013/pr13-closed-consultations/.

16.63 Network Rail stated in its April 2013 conclusions document that it considered the revised methodology was robust and represented a significant improvement over PR08. But in the light of its conclusion that the adoption of the findings from Serco to allocate the vertical track damage costs should be deferred until CP6, Network Rail argued in its April 2013 conclusions that that it would inappropriate to introduce the revised methodology.

Allocating other variable usage costs to individual vehicles

16.64 Network Rail has estimated that civils and signalling variable usage costs make up around 10% and 5% of total variable usage costs, respectively. The Serco study also recommended changes to the methodologies for apportioning other variable usage costs to individual vehicles. The recommendations were:

(a) to use the revised Serco equivalent track damage equation for apportioning variable usage costs for embankments, culverts and masonry underbridges;

(b) to use the civils methodology for apportioning variable usage costs for metallic underbridges, but with a modification to one of the parameters (the modified axle load exponent); and

(c) to apportion 50% of the signalling costs on the basis of vehicle mileage, and the other 50% on the basis of the (revised) equivalent track damage equation (in CP4 all signalling costs were allocated on the basis of the equivalent track damage equation).

16.65 In its April 2013 conclusions, Network Rail decided not to implement the revised methodology in CP5, instead retaining the CP4 methodology, on the basis that doing this was consistent with its decision not to implement the revised methodologies for apportioning track variable costs.

Suspension bands

16.66 In PR08, suspension factors took the form of discounts or premia applied to the VUC for each freight vehicle on the basis of descriptions of bogie type. The aim of this was to provide a discount for those vehicles which used 'track friendly' bogies[272] and hence an incentive for their use. In CP4, Network Rail conducted work and concluded on a new approach to determine suspension factors. The new approach uses a metric

[272] A bogie is a framework connected to the underside of the vehicle to which the wheels are attached.

(the ride force count or RFC) rather than qualitative descriptions for calculating the impact of suspensions on track damage.

16.67 We confirmed our acceptance of this approach first by letter[273], where we set out the conclusions in some detail, and then as part of our January 2013 conclusions on track access charges. The new approach will apply to vehicles which start running on the network during CP5 and vehicles that have been opted in by a party that has provided the requisite data on vehicle characteristics to Network Rail as part of PR13.

Network Rail's SBP forecast

16.68 Network Rail forecast VUC income for CP5 after it had concluded on its methodology for calculating total variable usage costs but before it had concluded on its methodology for allocating costs to individual vehicles. Network Rail's forecasts used an average (passenger and freight) uplift factor in order to estimate the level of CP5 VUC income for passenger and freight. They are presented in Table 16.6.

Table 16.6: Network Rail's SBP estimated VUC income for CP5

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Great Britain						
Franchised passenger	186.5	187.4	188.3	191	191.9	945.1
Freight	63.4	65.1	69.2	71.4	73.9	343.0
Open access passenger	3.0	3.0	3.0	3.0	3.1	15.1
England & Wales						
Franchised passenger	172.1	172.9	173.7	176.2	177.1	872.0
Freight	57.4	59.0	62.8	64.9	67.2	311.3

[273] Letter of 24 September 2012, VUC – Calculating suspension factors for CP5 for freight vehicles, http://www.rail-reg.gov.uk/pr13/PDF/vuc-suspension-bands-240912.pdf

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Open access passenger	3.0	3.0	3.0	3.0	3.1	15.1
Scotland						
Franchised passenger	14.4	14.5	14.5	14.7	14.8	72.9
Freight	6	6.2	6.3	6.5	6.7	31.7
Open access passenger	0.0	0.0	0.0	0.0	0.0	0.0

Note: numbers may not reconcile due to rounding.

Treatment of the Serco analysis in allocating variable usage costs to individual vehicles

16.69 We were supportive of the Serco work, and its contribution to a better understanding of cost drivers. We were keen to understand the significance and robustness of the Serco work. We conducted a review using a multi-disciplinary team, and have prepared a paper setting out the process we followed and the content of our review[274]. The Serco research into vertical track damage was intended to replace a quantitative relationship between vehicle characteristics and vertical track damage that was in excess of ten years old. We agreed with Network Rail's view that the research was robust and represented a step change improvement in the measurement of vertical track damage. Table 16.7 illustrates how the change would bring the measurement of vertical track damage with respect to axle load into line with research conducted elsewhere. The exponent determines the relationship between axle load and cost such that, all else being equal, cost per gross tonne mile is proportional to axle load to the power of the exponent; an exponent of 1 means that a vehicle with double the axle load causes twice the amount of damage.

[274] This will be made available shortly after we publish our draft determination, at http://www.rail-reg.gov.uk/pr13/consultations/draft-determination.php.

Table 16.7: Summary of axle load exponents

	Exponent	Exponent including gross tonnage
VUC CP4	0.49	1.49
Serco analysis for CP5	1.13	2.13
Railway Group Standards EMGTPA	1.00	2.00
Öberg and Andersson	Up to 3.0	Up to 4.0
UIC Code 714	1.00	2.00

Source: TTCI research on VUC for CP4[275]; Serco analysis for CP5.

16.70 We wrote to Network Rail in April 2013[276] stating that without clear reasoning to the contrary, we consider disregarding research that improves the cost reflectivity of charges to be inconsistent with the charging objectives that we had set, and doing so inhibited us from being able to assess the most appropriate charging package for CP5. We asked Network Rail to recalculate the VUC using the PR13 research findings on apportioning costs to individual vehicles, where it considered that to do so – taking account of data constraints etc – improved the cost reflectivity of the charges. Network Rail replied with revised estimates of the VUC[277]. In these revised estimates, Network Rail has:

(a) used the Serco allocation methodology for estimating vertical track forces;

(b) retained the CP4 methodology for estimating horizontal track forces. Network Rail has indicated that it has had considerable difficulty obtaining the necessary vehicle data from train operators and vehicle owners. It therefore concluded that it was impractical to implement this change at this time; and

(c) partially implemented the Serco methodology with respect to civil and signalling costs.

[275] See Table 4 of *TTCI (March 2008) Methodology to Calculate Variable Usage Charges for Control Period 4*, UK NR Report No. 08-002, http://www.networkrail.co.uk/StrategicBusinessPlan2008/TTCI_(UK)_variable_charges_methodology.pdf.

[276] Our letter can be found at http://www.rail-reg.gov.uk/pr13/consultations/freight-charges.php.

[277] http://www.networkrail.co.uk/NetworkRailresponsetoORRletter.pdf.

16.71 Network Rail set out the impact of the Serco methodology on the VUC in its letter, and a summary of this analysis is shown in Table 16.8.

Table 16.8: Network Rail calculation of average VUC (2012-13 prices, end CP5 efficiency)

Average charge	Freight (£/kgtm)	Passenger (p/vehicle mile)
Network Rail April 2013 conclusions (no Serco)	1.80	11.6
Network Rail May 2013 with Serco	2.51	10.2
Variance	39%	-12%

Source: Network Rail letter to ORR, 3 May 2013, http://www.networkrail.co.uk/NetworkRailresponsetoORRletter.pdf.

Our determination of variable usage costs

16.72 We set out our determination of the variable usage costs in this section, and the VUC, and associated forecast Network Rail income, in the next section. The two do not necessarily equate because, for example, certain large changes to charges will be phased in.

16.73 We set out in our January conclusions that we are content with Network Rail's methodology for estimating the VUC for the average vehicle, and we set a cap on the charge on this basis.

16.74 The average VUC contained within the SBP was higher than that in Network Rail's March 2012 freight cap conclusions, reflecting some higher unit costs. These are subject to our determination for efficiency, as set out earlier in this chapter (paragraph 16.38 onwards).

16.75 We have also reviewed the Serco work with respect to vertical track damage carefully and consider its findings to be a significant improvement in the allocation of track costs to individual vehicles. Therefore we are content to accept this new methodology for calculating variable usage costs (although we have taken into account the potential effects of its immediate introduction, and are mitigating these in our decision on how changes to the VUC should be implemented)

16.76 Estimates of average variable usage costs per unit of traffic are set out in Table 16.9. These are costs rather than charges but are the basis on which the VUC is set, and

the average VUC for CP4 is shown for comparison. We have adjusted estimates from previous reports so that they are expressed with consistent units, prices and efficiencies[278].

Table 16.9: Weighted average variable usage costs

Weighted average cost (2012-13 prices)	Freight (£/kgtm)	Passenger (p/vehicle mile)	All traffic (£/kgtm)
CP4 weighted average actual charge			
Weighted average 2013-14 (source: SBP, 2013-14 forecast traffic)	1.76	9.36	1.92
CP5 weighted average estimated cost			
Network Rail March 2012 conclusions (based on PR08 determined efficiency)	2.02	-	2.16
ORR January 2013 cap (based on PR08 determined efficiency)[279]	2.32	-	-
Network Rail SBP (2014-15 forecast traffic)	2.05	10.91	2.23
Network Rail April 2013 conclusions (no Serco)	1.80	11.59	-
Network Rail May 2013 with Serco	2.51	10.24	-

Source: ORR calculations; Network Rail March 2012 freight cap conclusions; SBP; Network Rail letter to ORR, 3 May 2013, [1] http://www.networkrail.co.uk/NetworkRailresponsetoORRletter.pdf.

16.77 Table 16.10 shows Network Rail's estimates of how the Serco research impacts on estimates of variable usage costs for certain key freight commodities.

[278] Network Rail has calculated the average cost by weighting costs for individual vehicles by the amount of traffic (and hence Network Rail income) associated with that vehicle. The choice of year used to as the basis of traffic for weighting the charge does vary between some measures. This introduces some inconsistency between measures, but the effect is small.

[279] This is the £1.68 per kgtkm referred to early in the section with adjustment for prices and for PR08 efficiency and conversion from km to per mile.

Table 16.10: Network Rail's estimates of the impact of implementing Serco research on estimates of VUC for certain key commodities

	Increase in VUC resulting from implementing Serco research
Industrial Minerals	71%
Coal ESI	71%
Construction Materials	55%
Iron Ore	52%
Steel	42%
Biomass	33%
Domestic Intermodal	1%
European Intermodal	1%

Source: Network Rail letter to ORR, 3 May 2013, http://www.networkrail.co.uk/NetworkRailresponsetoORRletter.pdf.

Our determination of VUC

16.78 As we have set out, we agree with Network Rail's assessment that the Serco research, supported by benchmarking from other sources, is a robust piece of analysis that represents a step-change improvement in the understanding of the drivers of vertical track damage. We think that this analysis should be reflected in charges because it sends the right price signals to operators, customers, and others in the value chain regarding choice of vehicle and use of the infrastructure.

16.79 We are also very conscious that implementing this new research evidence, as set out above, would result in very significant increases in the VUC for some commodities. We have listened carefully to the rail freight industry's representations on this. We understand that many rail freight markets are highly competitive, not least with road haulage, and that it would take the industry and its customers some time to adjust to such changes in a way that is efficient.

16.80 We have reached our decision on the VUC with these representations in mind but also by considering the cumulative effect of the changes to all charges on operators

and their customers. In reaching our decision we have applied our statutory duties and used our judgment to apply an appropriate amount of weight to each of them.

16.81 We have concluded that:

(a) the new rates for the VUC for all passenger traffic will be implemented in full from the start of CP5. This is because these result in a decrease in the average VUC charge for passenger operators and we consider it appropriate that passenger operators benefit from the new evidence on cost drivers as soon as possible;

(b) the new rates for the VUC for freight traffic will be implemented subject to a cap on the average VUC that is lower than the cap we concluded on in our January 2013 conclusions. We consider that this is necessary to reflect the balance of our statutory duties and conclude that the cap should be 10%[280]. In balancing our statutory duties we also think that the capped average increase to the VUC for freight traffic should be phased in during CP5 on the same profile as the phasing for freight specific charge; 0% in years 1 and 2, 20% of the full charge in year 3, 60% in year 4 and 100% in year 5. This results in an average increase in the VUC in real terms of 3.6% for CP5 overall.

(c) the 10% cap referred to in (b) above should be implemented in a way that is cost reflective and does not unduly discriminate. We consider this is best achieved by first calculating the increase for each freight VUC charge as if a cap was not applied, then adjusting the increase to reflect the 10% cap in a way that is proportionate to the increase for that particular charge as compared with the average increase for all VUC freight charges. For example, if uncapped freight VUC charges were to increase on average by 30%, then to meet the 10% cap, the individual charges would increase by a third of their uncapped increase. In this way, the relativities between the different VUCs for different vehicle types better reflect the relativities in the extent to which different vehicle types drive cost.

16.82 We have made our decision with reference to cumulative changes to all track access charges, set in the context of the overall PR13 package, which we expect to deliver many important improvements in the services rail freight can provide its customers.

[280] For a constant mix of traffic, based on the last full year for which suitable traffic data are readily available (which may be 2011-12 or 2012-13).

We set out the cumulative change in charges for different types of traffic in paragraph 16.379 onwards.

16.83 Table 16.11 shows our determination of Network Rail's income from the VUC. Table 16.12 shows our estimate[281] of the weighted average VUC for franchise passenger, open access passenger and freight services, consistent with our determination.

16.84 Our decision to cap the increase in the VUC for freight means that the forecast VUC income is below that which it would be if the cost reflective charges were introduced in full, with a commensurate increase in FTAC (or grants).

Table 16.11: Our determination of forecast VUC income for CP5

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total CP5
Great Britain						
Franchised passenger	166.3	167.0	167.7	170.0	170.8	841.8
Freight	54.5	56.1	60.9	65.5	70.6	307.7
Open access passenger	1.9	1.9	1.9	1.9	1.9	9.5
England & Wales						
Franchised passenger	153.4	154.1	154.7	156.9	157.6	776.7
Freight	49.3	50.8	55.3	59.5	64.2	279.1
Open access passenger	1.9	1.9	1.9	1.9	1.9	9.5
Scotland						
Franchised passenger	12.9	12.9	13.0	13.1	13.2	65.1
Freight	5.2	5.3	5.6	6.0	6.5	28.6

[281] These are broad estimates based on aggregate data. Following publication of our draft determination, Network Rail will calculate prices for individual vehicles and recalculate the average as part of this. The average will depend on mix of vehicles used.

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total CP5
Open access passenger	0.0	0.0	0.0	0.0	0.0	0.0

Note: numbers may not reconcile due to rounding.

Table 16.12: ORR conclusions: estimated weighted average VUC

Weighted average charge (2012-13 prices)	Freight (£/kgtm)	Franchise passenger (p/vehicle mile)	Open access passenger (p/vehicle mile)
CP4 weighted average actual charge			
Weighted average 2013-14 (source: SBP, 2013-14 forecast traffic)	1.76	9.36	13.28
CP5 weighted average estimated charge – ORR conclusions			
2014-15	1.76	9.32	13
2015-16	1.76	9.32	13
2016-17	1.80	9.32	13
2017-18	1.87	9.32	13
2018-19	1.94	9.32	13

Notes:

1. Source: ORR calculations using SBP and Network Rail letter to ORR, 3 May 2013, adjusted for our determination on efficiency.
2. The average freight CP5 charge is calculated using 2013-14 forecast traffic, whereas the passenger charges are calculated using 2014-15 traffic.
3. Due to data constraints, we estimate the open access charge to two significant figures only.

Other matters relating to the VUC

16.85 In this section we set out our conclusions on other policies related to the VUC on which Network Rail consulted.

Temporary default rates

16.86 In CP4, if track access charges of a freight vehicle have not been approved by ORR by the time that the vehicle has started running on the network, Network Rail instead

has levied a default rate as an interim measure[282]. There has been no equivalent in the passenger contracts which have required a specific amendment to add an interim charge for each new vehicle. There have been several vehicles for which default or interim rates have been levied in CP4, where Network Rail has not known all the vehicle characteristics needed to calculate the VUC. When the correct rate is eventually approved, Network Rail has re-charged all journeys during the control period (including those already charged at the default or interim rate) at the approved rate.

16.87 Network Rail has concluded, in its VUC April 2013 conclusions, on making the following changes to this procedure:

(a) applying a default rate to all passenger and freight vehicles;

(b) charging a default rate for the VUC only, on the presumption that other charges, which in most cases are flat rates, would be readily calculable;

(c) introducing default rate bands (e.g. locomotive or laden wagon), where the respective rate for each of these bands is the highest relevant rate on the CP5 price list.

16.88 As before, when the correct rate is eventually approved, Network Rail would re-charge all journeys during the control period previously charged at the default rate by using the new approved rate. Income already received at the default rate would be refunded (i.e. the net impact on operators will be the difference between the default and ORR new approved rate).

16.89 Network Rail has argued that the default rates should be the highest rather than average rates so that operators (and others such as rolling stock manufacturers) are incentivised to provide the correct vehicle characteristics more quickly. The process set out in the track access contracts mean that correct rates should ordinarily be calculated and approved in good time. Provided that this process is adhered to, major delays in calculating the rate would primarily be as a result of lack of information regarding a particular vehicle characteristic, which operators are best placed to

[282] This is set out in paragraph 2.2 of Schedule 7 of the track access contract, the default rate being £1.82 per kgtm.

provide. On this basis, we agree with Network Rail's conclusions to set the default rates at high levels.

16.90 Network Rail has committed, prior to commencement of CP5, to issuing guidance to stakeholders setting out the information required and details of the end-to-end process for calculating VUC rates, and to strive to work collaboratively with key stakeholders when developing this guidance. We think that such guidance is a good initiative which will be an important complementary measure to that of having the default rate.

16.91 We consider that the other changes that Network Rail has proposed make this provision more logical and equitable across categories of vehicle, and we welcome them. We will consult on the contractual changes including those would implement these conclusions on 12 July 2013.

Rates for modified vehicles

16.92 Network Rail has concluded that where a vehicle is modified mid-control period, the VUC for that vehicle should be adjusted accordingly (to reflect the changed characteristics of the vehicle). We are pleased that Network Rail has set out its intention to agree to amendments to its track access contracts on this basis: we have previously set out our support for changes to the VUC to reflect modifications to a vehicle. This form of cost reflective charging incentivises operators to undertake such modifications to reduce Network Rail's costs.

Circumstances in which an individual charge might be changed during CP5

16.93 Network Rail has consulted on and concluded on its proposal that, with the exception of vehicles that have been subject to modification, VUC rates for individual vehicles will be fixed ("locked down") for CP5. It has cited, in particular, that the industry has made reasonable endeavours to set VUC rates using a robust list of vehicle characteristics. It has set out this process in its conclusions, and we encourage operators, even at this late stage in PR13, to check that they are content with the parameters that Network Rail has used. As we have already set out, Network Rail has also prepared the methodology and calculated charges with extensive industry engagement and with careful review from us and / or our independent reporter.

16.94 In CP4, the passenger operators' model contract (but not the freight model contract) has allowed for changes to the VUC and traction electricity modelled rates in

circumstances of “manifest error” (paragraph 9.2 of Schedule 7). Given that the charges have been calculated and approved on the basis of extensive industry engagement and audit, we will remove the “manifest error” provision in the passenger contract. The PR13 process, with extensive industry engagement and audit, should ensure that the charges are compliant with the Access and Management Regulations.

Capacity charge

16.95 The capacity charge is set to reflect costs directly incurred, which means the costs that vary with traffic. Under the performance regime (Schedule 8 of the track access contract, as set out in chapter 20 of this document) Network Rail is liable for train lateness or delays and cancellations that are not the fault of other operators, in particular delays caused by Network Rail or due to other factors such as the weather. The scale of Network Rail’s Schedule 8 payments varies with traffic, however, as the volume of traffic affects Network Rail’s ability to manage the knock-on delays resulting from incidents; this variation in Schedule 8 payments is a cost directly incurred that is recovered through the capacity charge.

The capacity charge in CP4

16.96 The capacity charge was established as part of the Access Charges Review 2000. It was calculated by applying an estimated mathematical relationship to capacity utilisation (measured by the so-called Capacity Utilisation Index or CUI) and traffic volume-related delays for which Network Rail is liable (so-called Congestion-Related Reactionary Delays or CRRD). The CUI varies with traffic, and the associated change in CRRD and hence Schedule 8 payments were calculated using this relationship.

16.97 The capacity charges we determined in PR08 were derived from CUI and CRRD data compiled for the Access Charge Review 2000. The capacity charge for franchise passenger services used Schedule 8 rates consistent with those applied in CP4, whereas the capacity charge for freight services was uplifted in PR08 only for inflation.

16.98 In CP4, the capacity charge for passenger services has been levied by service group, whereas the freight capacity charge has been a flat rate for the entire network. Both charges have been subject to a weekend discount to reflect lower weekend traffic volumes.

Calculating the charge in PR13

16.99 In addition to the ORR-led recalibration of Schedule 8 rates, Network Rail has undertaken a recalibration of the capacity charge for PR13. We considered this important in the calculation of the capacity charge, and also because we consider that having an updated understanding of capacity utilisation and its relationship with delay across the network will be valuable in itself. The industry can use this updated information in work to develop charges beyond PR13. It is also a useful metric to inform ongoing work to better understand Network Rail's performance with respect to its role as a system operator.

16.100 Network Rail commissioned Arup with Imperial College to undertake the recalibration. The consultants carried out the recalibration in the following stages:

(a) they developed a dataset for 6,688 individual components of the network, referred to as constant traffic route sections, and 24 time bands across the week. They calculated the CUI (using timetable data) and the CRRD (using Schedule 8 data) for each route section and time band;

(b) they estimated the impact of capacity utilisation on delay by testing statistics relationships between the CUI and CRRD;

(c) they estimated the impact of a small change in capacity utilisation (for example, an additional train, "CUI+1") on delay on each route section during each time band, by applying the relationship between CUI and CRRD that they established;

(d) they calculated the financial cost to Network Rail of the additional delay by applying the weighted average Schedule 8 payment rate, for each route section and time band; and

(e) they aggregated the financial costs by service code, weighted by train miles, in order to estimate charges.

16.101 Arup also reviewed whether certain aspects of the CP4 capacity charging regime remained valid for CP5, including reduced charges at weekends to reflect lower weekend traffic volumes and reduced freight charges to reflect Network Rail's ability to re-route some freight trains in the event of disruption to the network.

16.102 Arup calculated substantially higher capacity charges, reflecting:

(a) significantly higher Schedule 8 payment rates for CP5 (reflecting greater associated revenue per train and other factors);

(b) higher capacity utilisation across the network on average, resulting in an increased number of capacity-related reactionary delays; and

(c) a higher proportion of freight services using more congested high value parts of the network (for example as a result of a shift from bulk to container traffic).

16.103 The recalibration of the capacity charge would, if implemented, result in very large percentage increases in the charge for freight (of the order of 400%) and some passenger operators e.g. open access (where the increase was in excess of 1,000%). Some fluctuations in individual charges relate to Network Rail's conclusion to levy the charge on passenger services at a more disaggregate level, on the basis that that was more cost reflective[283].

Network Rail's income forecasts

16.104 Network Rail's SBP was published before the recalibration of Schedule 8 and the capacity charge had been completed. Because of this, Network Rail estimated the capacity charge income forecasts for CP5 for its SBP using CP4 capacity charge rates (uplifted for inflation). Its estimates are shown in Table 16.13.

Table 16.13: Network Rail's SBP estimated capacity charge income for CP5

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Great Britain						
Franchised passenger	174.4	174.8	175.1	175.5	175.9	875.7
Freight	4.5	4.6	4.9	5.1	5.3	24.4
Open access passenger	1.1	1.1	1.1	1.1	1.1	5.5
England & Wales						
Franchised passenger	168.8	169.2	169.6	169.9	170.3	847.8

[283] In CP4, the capacity charge is levied by service group for passenger services. Network Rail concluded that for CP5 the capacity charge would be levied by service code, where each service group consists of a number of service codes.

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Freight	4.1	4.2	4.5	4.6	4.8	22.2
Open access passenger	1.1	1.1	1.1	1.1	1.1	5.5
Scotland						
Franchised passenger	5.5	5.6	5.6	5.6	5.6	27.9
Freight	0.4	0.4	0.4	0.5	0.5	2.2
Open access passenger	0.0	0.0	0.0	0.0	0.0	0

Note: numbers may not reconcile due to rounding.

16.105 In April 2013 Network Rail produced updated income forecasts incorporating the methodology developed by Arup and the draft CP5 Schedule 8 Network Rail payment rates (chapter 20 gives a precise description of these). Table 16.14 compares forecast capacity charge income for CP5 using the two sets of rates.

Table 16.14: Estimates of Network Rail's capacity charge income for Great Britain

£m, CP5 total (2012-13 prices)	Income by levying CP4 CC rates	Income by levying Arup rates
Franchised passenger	520	2,262
Freight	197	562
Open access passenger	186	513

Stakeholders' views on the capacity charge and possible alternatives

Challenges on the principle of and methodology used to calculate the capacity charge

16.106 Prior to the introduction of the capacity charge, Network Rail recovered the additional Schedule 8 costs of additional services on the network through negotiated bespoke arrangements. The capacity charge, calculated by formula, removed the considerable administrative costs associated with such arrangements.

16.107 Certain stakeholders, however, have expressed concern about the capacity charge. Some of these concerns related to its design, whereas others relate to the increased

cost it imposed on operators, relative to the bespoke system, because it has been charged to all traffic rather than, under the previous arrangements, being charged just to additional traffic.

16.108 For example, freight operators have argued that they should not pay the capacity charge on forecast traffic levels; rather they should only pay the capacity charge on traffic above forecast. This is because Schedule 8 is a benchmarked regime. In particular, reactionary delay associated with existing traffic is reflected in Network Rail Schedule 8 benchmarks, meaning that Network Rail does not incur net costs associated with existing traffic levels.

16.109 Certain freight operators have argued both as part of PR08 and PR13 that the capacity charge is unacceptable in its current form because it over recovers in that it raises revenue in excess of the total costs associated with increases in traffic, and rather it should be levied only on traffic above that forecast in our determination. We discuss the over and under recovery of costs with respect to of variable charges in the VUC section, and address this point there.

Alternative approach

16.110 In April 2013, the Rail Freight Operators' Association (RFOA) submitted an alternative approach for calculating a capacity charge for freight operators[284].

16.111 The suggested approach is based on reviewing the difference between actual and benchmarked level of traffic on a periodic basis. It would start from establishing a mileage based baseline consistent with Schedule 8 and our PR13 determination. Actual mileage would then be monitored against this baseline. Where mileage exceeds the baseline a per mile capacity charge would be levied. The charge would be levied periodically e.g. annually, via a wash up process. There would only be a payment if the calculation were positive i.e. if mileage exceeded the baseline.

16.112 In terms of financial flows, this change would mean that Network Rail would receive substantially less funds from this alternative than it would from a capacity charge because the expected revenue associated with this mechanism would be close to zero. Any net change in total forecast variable charges revenue would be offset by a change to the revenue Network Rail received from FTAC. Just as we have with the

[284] This letter will be published at http://www.rail-reg.gov.uk/pr13/Publications/key-publications-by-stakeholders.php .

volume incentive, we would need to calculate the baseline of freight traffic carefully in making these adjustments.

16.113 There is less merit in this approach for passenger operators (which are currently held harmless by franchise agreements) but the capacity charge could in principle be levied on them in the same way.

16.114 As we understand it, such an approach would allow Network Rail to recover its changes to Schedule 8 costs associated with traffic diverging from the forecast. It would be a blunter incentive than the capacity charge because it would apply to all freight operators on an equivalent basis, irrespective of the identity of the operator that had made particular service changes.

16.115 We think that RFOA's submission is a useful proposal and are open to suggestions as to how Network Rail could recover its directly incurred costs in a way that is consistent with our obligations under EU law and with our own regulatory policies.

16.116 We also received a representation from an open access passenger operator supporting the proposals and asking that it should also be applied to them.

16.117 Alongside this draft determination we are considering the proposal further, and seek views on the merits of introducing this mechanism as a substitute to retaining the existing capacity charge in CP5. We also seek views on whether this mechanism should be adopted only for freight operators or also for passenger open access and/or franchised passenger operators and on what the implications of its adoption for these operators would be.

Our assessment of Network Rail's recalibration of the capacity charge

16.118 Network Rail and Arup carried out their review and recalibration of the capacity charge with extensive industry engagement, including a capacity charge working group. Through the working group, the methodology developed has been subject to extensive scrutiny. In addition to Arup's quality assurance, both Network Rail and we have conducted high-level sense checks of the calculations. Our view on the basis of this fairly high level engagement is that the work appears to have been carried out well and to be robust. As the recalibration has been carried out by independent consultants, Arup, with appropriate quality assurance, we were not intending to conduct a detailed audit of the work. Given the scale of the increases in the

recalibrated rates, however, we recognise that were the rates to be introduced a more detailed review and audit would be necessary.

16.119 We recognise that the capacity charge is a contentious area for freight and open access operators. We do not necessarily accept the arguments they have made against the capacity charge and believe it is important to provide incentives for Network Rail and operators in relation to the making available of capacity and its use, particularly where there is congestion. However, we do recognise that the pattern of use of the network is now very different from when the capacity charge was introduced and are concerned that further work is needed to establish whether the charge is the best way fully to reflect the value of capacity or the costs generated in its allocation and usage.

16.120 As part of our major review of charges for CP6, in which we will work closely with the industry including RDG, we are planning an extensive review of the way that charges reflect cost and in doing so incentivise efficient allocation, use and expansion of capacity. We may therefore substantially change the design or role of the capacity charge in future.

16.121 The changes arising from the Arup review are very material and we are conscious that it is undesirable for track access charges to fluctuate significantly from one periodic review to the next from the perspective of industry investment and planning.

16.122 In light of the above, we have concluded that we will not implement the recalibrated capacity charges as part of PR13. We will instead either implement the alternative proposal put forward by freight operators (possibly applying it also to open access passenger operators and/or franchise passenger operators, having regard to their views on this), or approve capacity charge rates that have been calculated using the methodology established in CP4, uprated for inflation.

16.123 If we adopt the latter approach, we expect some of the capacity charges to change as we take the opportunity to address certain anomalies identified during the course of CP4, including updating charter operators' contracts to incorporate a Schedule 8 benchmark and capacity charge. (We discuss this later in this chapter, in the section on charter traffic.)

16.124 We recognise that by setting the capacity charge below the marginal Schedule 8 cost associated with a change in traffic, we are potentially disincentivising Network Rail to

accommodate extra traffic. However, in our judgement this is preferable to introducing the recalibrated rates, given the issues set out above. We consider, however, that the volume incentive serves to offset this effect. The reduction in charges revenue associated with this decision will result in a commensurate increase in FTAC levied on franchise passenger operators.

16.125 As indicated above, we asked for Network Rail to undertake the recalibration of the charge for a number of reasons. Although the recalibration will not be implemented in CP5, we expect that the work that has been undertaken, in particular the recalibration of the capacity utilisation index disaggregated across sections of the network and by time of day and week, and an updated understanding of the relationship between this utilisation and delay, to be a major source of empirical evidence in our and the industry's work reviewing charges for CP6.

16.126 Table 16.15 shows our income forecast for the capacity charge. This income forecast is the same as the Network Rail SBP income forecast, which also used CP4 capacity charge rates.

Table 16.15: Our forecast of capacity charge income for CP5

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Great Britain						
Franchised passenger	174.4	174.8	175.1	175.5	175.9	875.7
Freight	4.5	4.6	4.9	5.1	5.3	24.4
Open access passenger	1.1	1.1	1.1	1.1	1.1	5.5
England & Wales						
Franchised passenger	168.8	169.2	169.6	169.9	170.3	847.8
Freight	4.1	4.2	4.5	4.6	4.8	22.2
Open access passenger	1.1	1.1	1.1	1.1	1.1	5.5

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Scotland						
Franchised passenger	5.5	5.6	5.6	5.6	5.6	27.9
Freight	0.4	0.4	0.4	0.5	0.5	2.2
Open access passenger	0.0	0.0	0.0	0.0	0.0	0

Note: numbers may not reconcile due to rounding.

Coal spillage charge

16.127 The coal spillage charge and coal spillage reduction investment charge (CSRIC) were introduced as part of PR08. Prior to CP4, these costs were recovered through a 20% uplift on the VUC for vehicles transporting coal. The charges have been levied on freight operators carrying coal and were designed to:

(a) reflect the cost to Network Rail of spilt coal on the network; and

(b) incentivise freight operators, the coal industry and supply chain to reduce the level of coal spillage on the network.

16.128 The costs attributed to coal spillage consist of the clean-up and delay costs of point failures, clean-up to reduce the frequency of points failures and the reduced service life for track affected.

16.129 Currently spillage is not a material problem for other commodities and so there are no analogous charges. We consider it is appropriate to levy a distinct charge for coal spillage, rather than incorporate it in the VUC, so that there is greater transparency regarding this industry cost.

Charges for coal spillage in CP4

16.130 In CP4 the coal spillage charge recovered costs associated with coal spillage on the network, whereas the CSRIC revenue was used to fund investment in equipment at coal terminals to reduce such coal spillage.

16.131 For CP4, we incorporated an annual review mechanism into track access contracts for both the coal spillage charge and the CSRIC. The purpose of this review

mechanism was to incentivise operators more effectively to reduce coal spillage. This mechanism adjusted the coal spillage charge annually in proportion to the number of points failures in the preceding year where coal spillage was recorded as being a contributory factor to the failure ("relevant points failures"). This is set out in Table 16.16. Although the number of relevant points failures fell sharply in the first two years of CP4, thus reducing the charge for 2010-11 and 2011-12, in the third year a substantial increase was recorded.

Table 16.16: Coal spillage charge for each year of CP4 (2012-13 prices)

Year	Relevant points failures[285]	Coal spillage charge (p/kgtm)	Coal spillage reduction investment charge (p/kgtm)	Combined charges (p/kgtm)
2009-10	203	29.06	2.75	31.81
2010-11	154	22.05	2.75	24.80
2011-12	150	21.47	-	21.47
2012-13	231	25.27	-	25.27

16.132 The CSIRC was discontinued from April 2011 on the basis that surplus unspent funds had accrued, at that point, as a result of the charge.

Network Rail's calculation of the charges in PR13

Coal spillage charge

16.133 The coal spillage charge methodology was originally derived from a detailed assessment conducted by the independent reporter Halcrow as part of PR08. Network Rail consulted on its proposed coal spillage cost estimates in December 2012[286]. In its consultation it proposed retaining much of the PR08 methodology for estimating coal spillage costs.

16.134 Network Rail's consultation document detailed the methodology used to estimate the impact of coal spillage and the assumptions used to estimate each cost category and

[285] Based on the recorded number of relevant points failures from the previous financial year, except for 2009-10 where it was based on the number of recorded points failures occurring in 2007-08.

[286] *Network Rail's consultation on the Coal Spillage Charge and the CSRIC*, published in December 2012, can be accessed at http://www.networkrail.co.uk/WorkArea/DownloadAsset.aspx?id=30064784388.

subsequent coal spillage charge. The cost categories it used are shown in Table 16.17.

Table 16.17: Coal spillage cost categories and metrics

Cost category	Metrics applied to calculate costs
Preventative intervention to reduce the frequency of points failures from coal spillage	Frequency of CP4 interventions; deployment costs
Clean-up costs associated with points failures	Relevant points failures recorded in CP4
Delays due to points failures (Schedule 8 performance regime costs)	Relevant delay costs in CP4
The costs associated with the reduced service life of plain line track	Length of affected track miles taken from Halcrow recommendations and adjusted in the conclusions to take account of investment
The costs associated with the reduced service life of point ends	Number of affected point ends calculated based on affected track miles per loading and unloading site

16.135 In its December 2012 consultation, Network Rail's estimates of coal spillage costs were substantially higher than those that we determined in PR08. This was principally due to:

(a) the list of coal loading/unloading locations in PR08 appearing to have been substantially incomplete. Freight operators were consulted on the list of locations in PR013 (as they were for PR08), which had increased from 23 in PR08 to 38 in PR13. This substantially increases the estimate of coal spillage costs associated with reduced track service life; and

(b) some costs relating to preventative clean-up were omitted in PR08. The PR08 estimate did not include the costs associated with manual interventions to clean coal spillage off the network. Network Rail's PR13 estimates included these costs, and also the costs of Tube Cube[287], reflecting CP4 experience.

16.136 Freight operators and the Rail Freight Group (RFG) were concerned that the coal spillage charge on which Network Rail had consulted had increased considerably

[287] A road-rail vehicle attachment for cleaning ballast, introduced in CP4.

since PR08, despite investment undertaken during CP4 to reduce coal spillage on the network.

16.137 Operators also argued that Network Rail had provided insufficient evidence to support its cost estimates and assumptions, and that they were disappointed in the lack of progress made in understanding the costs associated with coal spillage.

16.138 We commissioned the independent reporter Arup to review Network Rail's methodology and estimates[288]. The reporter made a number of points including:

(a) confirmation, with photographic evidence, that coal spillage remained a significant issue on the network, despite the investment in CP4;

(b) a detailed review of the evidence and data available, and recommendations to improve recording of coal spillage incidents;

(c) support for Network Rail's proposal to include the new preventative clean-up categories in Network Rail's cost estimates; and

(d) recommendations regarding increasing the efficiency of the deployment of some clean-up interventions.

16.139 The reporter also investigated the impact of investment on coal spillage. During CP4, coal wagon rave cleaners had been installed at 7 out of 38 coal loading and unloading locations. The cleaners were designed to brush coal off the raves of wagons, reducing coal spillage onto the network outside the terminals. Network Rail's methodology did not directly take the impact of this investment into account, and hence the reporter considered that these costs were overstated. The reporter recommended certain changes to the methodology which had the result of reducing the estimated impact of coal spillage on track service life by 75% at locations fitted with coal wagon rave cleaners, and banded the costs associated with different point ends depending on their traffic levels.

16.140 Network Rail accepted the changes proposed by the reporter and made other changes to take account of consultation responses. It published updated coal spillage

[288] Arup's review of the Coal Spillage Charge (April 2013) can be accessed at http://www.rail-reg.gov.uk/pr13/publications/consultants-reports.php

charge estimates in its April 2013 conclusion document[289]. The net effect of these revised estimates was a reduction in the coal spillage charge from 64.97 pence per kgtm, as proposed in Network Rail's consultation document, to 52.78 pence per kgtm (2012-13 prices).

16.141 However, following the reporter review, a stakeholder argued that Network Rail's methodology for estimating track renewal costs at point ends contained substantial double counting of track costs. In May 2013 Network Rail revisited its estimates to address these concerns. Network Rail revised the affected mileages associated with each coal loading and unloading location and in some cases proposed a reduction in track mileage affected by coal spillage to reflect this double counting issue. This amendment reduced Network Rail's estimate of the coal spillage charge further to 43.12 pence per kgtm. This compares to a charge of 31.81 pence per kgtm in CP4.

16.142 Table 16.18 shows the coal spillage cost estimates of PR08, Network Rail's consultation and its conclusions. All costs are shown at end of CP5 efficiency, which, as explained in the discussion on the efficiency overlay, was the basis of the charge for CP4, and will also be for CP5.

Table 16.18: Coal spillage costs and charges

Cost category	PR08	Network Rail December 2012 consultation	Network Rail May 2013 updated conclusions
Coal spillage costs (£million a year)			
Cost of clean-up and delay minutes	0.21	0.11	0.11
Preventative intervention to reduce the frequency of points failures from coal spillage (Cost of Rail Vac & Tube Cube & Manual interventions on points failures)	0.57	1.58	1.14
Cost of point end service life reductions	1.03	1.79	0.99
Cost of Plain Line service life reductions	1.08	1.46	1.04
Total	**2.88**	**4.95**	**3.28**

[289] Network Rail's conclusions on the Coal Spillage Charge and the Coal Spillage Reduction Investment Charge, published in April 2013, can be accessed at http://www.networkrail.co.uk/CSC-and-CSRIC-conclusions.pdf.

Cost category	PR08	Network Rail December 2012 consultation	Network Rail May 2013 updated conclusions
Coal spillage charges (pence per kgtm)			
Coal spillage charge	29.06	64.97	43.12
CSRIC	2.75	-	-
Total coal spillage charges	31.81	64.97	43.12

Note: numbers may not reconcile due to rounding.

CSRIC and the annual review mechanism

16.143 In its April 2013 conclusions, Network Rail concluded that it would discontinue the CSRIC in CP5, subject to our approval. It did this on the basis that there were surplus funds available from the CP4 charges for future investment, and that cleaning equipment had already been installed at the busiest coal loading locations (e.g. Port of Immingham)[290]. The majority of respondents to Network Rail's consultation agreed with this change.

16.144 Network Rail also argued for the removal of the annual review mechanism of the coal spillage charge for CP5, on the basis that it was flawed and imposed a disproportionate administrative burden on the industry. A number of respondents disagreed with Network Rail's proposal, suggesting that it would remove an important incentive for operators to implement measures aimed at reducing coal spillage on the network.

Network Rail's SBP forecast

16.145 Network Rail's SBP was released during its consultation on the coal spillage charge, and hence did not reflect its final conclusions on the level of the charge. Its SBP income forecasts for the coal spillage charge are shown in Table 16.19.

[290] Network Rail recorded in its April 2013 conclusions on the coal spillage charge that the total fund receipts from the CSRIC were c. £295,000, and had been used to fund to that date 10 schemes at a cost of c. £250,000.

Table 16.19: Network Rail's SBP estimated coal spillage charge income for CP5

£m	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Great Britain						
Coal spillage charge income	4.9	4.9	4.9	4.9	4.9	24.5
England & Wales						
Coal spillage charge income	3.9	3.9	3.9	3.9	3.9	19.5
Scotland						
Coal spillage charge income	1.0	1.0	1.0	1.0	1.0	5.0

Note: numbers may not reconcile due to rounding.

Our determination of coal spillage charges income

Coal spillage charge

16.146 The coal spillage charge is set to reflect the costs of spilt coal on the network. It allows Network Rail to recover these costs and incentivises the coal supply chain, including freight operators, to reduce the level of coal spillage. We continue to think it appropriate to have a separate charge for this cost item, as the associated transparency should help incentivise the coal industry to reduce these costs, reduce its impact on the network, improving efficiency and the service received by users.

16.147 Network Rail's revised May 2013 estimates of the coal spillage charge have fallen considerably since its December 2012 consultation. This reflects changes Network Rail has made following recommendations made in the independent reporter's review, and extensive input from stakeholders. We consider that the changes Network Rail has made represent a substantial improvement on its December 2012 estimates. Notably:

(a) the cost estimates should take account of the impact of investment to reduce coal spillage on asset service life, and, incorporating recommendations from the reporter, they now do so; and

(b) stakeholders have worked with Network Rail to remove incidents of double counting track costs where loading or unloading sites were located in close

proximity – an issue that was not picked up by the reporter and on which freight operators are well placed to advise.

16.148 We also think that the methodology represents an improvement on that developed for PR08, which omitted some important costs associated with respect to manual interventions and particular loading and unloading locations.

16.149 A number of stakeholders have argued strongly that the methodology is subjective and insufficiently evidence-based. This particularly relates to the estimates of the impact of coal spillage on plain line and point end service life. This methodology was established by the reporter Halcrow in PR08 and was based on a detailed assessment of the incidence of coal spillage on track in relation to loading and unloading points. In PR13 the reporter used expert judgement to recommend changes to this approach to take account of investment in rave cleaners and to reflect the fact that the investment has tended to occur on busier routes. While we recognise that more detailed empirical research may increase the accuracy of these estimates, we consider the work conducted in both PR08 and PR13 to be proportionate to the scale of the charge.

16.150 We are concerned, however, about what appears to be missed opportunities to record incidents of coal spillage, and we are asking Network Rail to improve its records of such incidents in CP5.

16.151 We conclude that we accept Network Rail's revised May 2013 methodology for estimating the coal spillage charge, and its associated estimate, subject to adjustment to reflect our determination of Network Rail's efficiency.

16.152 Table 16.20 presents our forecast of coal spillage charge income for CP5, derived from Network Rail's SBP traffic forecasts. Our estimate uses Network Rail's May 2013 coal spillage charge which we have adjusted to account for our determination of Network Rail's efficiency, as set out in the relevant section of this chapter (paragraph 16.38 onwards). This results in a coal spillage charge of around £0.39 per kgtm, compared to Network Rail's December 2013 consultation estimate of £0.65, PR08 determined coal spillage charges of £0.32, and coal spillage charge in 2012-13 (adjusted under the annual review mechanism) of £0.25.

Table 16.20: Our determination of the coal spillage charge income for CP5

£m	2014-15	2015-16	2016-17	2017-18	2018-19	Total CP5
Great Britain						
Coal spillage charge income	3.0	3.0	3.0	3.0	3.0	14.9
England & Wales						
Coal spillage charge income	2.4	2.4	2.4	2.4	2.4	11.8
Scotland						
Coal spillage charge income	0.6	0.6	0.6	0.6	0.6	3.2

Note: numbers may not reconcile due to rounding.

CSRIC and the annual review mechanism

16.153 Network Rail has argued for the removal of the annual review mechanism and the removal of the CSRIC in CP6. We have reviewed its reasoning and that of respondents to its consultation carefully.

16.154 We are concerned in general to reduce administrative burden associated with contractual mechanisms[291], and with this in mind we agree with Network Rail that the CP4 annual review mechanism imposed disproportionate administrative costs to the industry, and have concluded on that basis to remove the mechanism for CP5. We plan to revisit this decision in the next access charges review (PR18), with a view to introducing an equivalent mechanism that takes account of traffic volumes and that is less administratively burdensome if we consider investment in cost-effective mechanisms to reduce coal spillage during CP5 has been insufficient.

16.155 We agree with Network Rail's conclusion to roll any remaining CSRIC funds into CP5, and to suspend the CSIRC during CP5. As with the annual review mechanism, we will revisit this decision in the next access charges review, recognising that both mechanisms provide incentives to reduce costs of coal spillage.

[291] See our consultation "reform of access contractual arrangements" (January 2012), www.rail-reg.gov.uk/server/show/ConWebDoc.10809

Next steps

16.156 We agree with the reporter's observation that in CP4 there was little systematic recording of evidence relating to volumes of work and costs directly attributable to coal spillage. We support its recommendation that steps be put in place by Network Rail to improve recording of such evidence during CP5.

16.157 We also note the reporter's recommendation that within Network Rail, a lead route be selected to treat coal spillage with machinery intervention methods in order to establish good practice to reduce unit cost and improve efficiency.

16.158 Both the annual review mechanism and CSRIC were designed to incentivise efficient investment to reduce coal spillage. We are alert to the industry's concern that their removal may result in the perpetuation of inefficiently high levels of coal spillage. We will therefore ask Network Rail to revisit both policies as preparation for PR18. It may be possible, for example, to reduce substantially the administrative costs associated with an annual review mechanism.

16.159 We expect operators and the wider coal supply chain to continue to make cost-effective investment to reduce the amount of coal spillage on the network. Such investment has reduced the coal spillage charge for CP5 from Network Rail's original estimate.

Charges for electric current for traction

16.160 Network Rail is the single biggest user of electricity in the UK. By the end of CP5, it expects electricity consumption to have increased by around 25% on current levels. As Chapter 6 describes, Network Rail recovers the vast majority of its traction electricity costs from train operators who require electricity to run their electrified train services. These costs are recovered through the traction electricity charge.

16.161 Electric current for traction (EC4T) can take four key forms:

(a) electricity consumed by trains;

(b) electricity consumed for non-traction purposes by Network Rail and other parties (e.g. London Underground Ltd);

(c) electricity lost in transmission through the infrastructure (i.e. third rail or overhead line equipment); and

(d) electricity generated through trains' regenerative braking (to return the energy from braking to the electrification system).

Calculating the charge in CP4

16.162 Currently around 25% of EC4T consumption is charged on the basis of consumption recorded by on-train meters (OTM). Metered regenerated energy has been netted off the energy charged. Operators pay an uplift on metered consumption net of regenerated energy to recover estimated transmission losses, referred to as the distribution systems losses factor (DSLF).

16.163 Until April 2010, all electrified train services were charged on the basis of modelled (i.e. unmetered) electricity consumption rates (taking the form of kWh per train mile or gross tonne mile), and around 75% of all EC4T is still charged in this way. Modelled services with regenerative braking have been charged at a discounted rate. Under this system, modelled and actual consumption have been reconciled through a year-end wash-up referred to as the volume wash-up. Transmission losses have been charged for implicitly through the modelled rate and volume wash-up; they have not been charged for explicitly. This volume wash-up reconciliation has occurred at the level of the electricity supply tariff area (ESTA). ESTAs are defined in Schedule 7 of the track access contracts. Network Rail's consumption amounts to around 3% of all EC4T and is also subject to the volume wash-up.

16.164 Track access charges, including EC4T charges, are contractualised in Schedule 7 of the track access contract. For metered operators, this is supplemented by the EC4T metering rules[292], which apply to all services billed through OTM. Currently, most aspects of the EC4T metering rules can be changed through an industry-led change process involving consultation, majority endorsement and our approval.

16.165 There are industry processes for procuring electricity. The reconciliation of electricity prices (i.e. £ per kWh) is in the track access contract and therefore falls within scope of PR13.

[292] The EC4T metering rules are at: http://www.networkrail.co.uk/using-our-network/on-train-metering/

Network Rail's SBP forecast

16.166 In its SBP, Network Rail made a number of forecasts in order to estimate the level of future income from the traction electricity charge. Network Rail's key forecasts included:

(a) using market projections of the electricity price for 2014-15 and 2011 DECC projections for each year of CP5 thereafter;

(b) estimating future electric traffic km by using actual 2011-12 data and making growth assumptions based on forecast increased electric traffic; and

(c) estimating the future rate of electricity consumption based on actual 2011-12 data.

16.167 Given these supporting forecasts, Network Rail has projected traction electricity charges in the first year of CP5 of £229m rising to £551m in the final year of CP5. This increase is largely due to a forecast increase in electricity prices[293]. As described above, in its SBP, Network Rail used market prices for 2014-15 and then October 2011 DECC forecasts for the periods 2015-16 to 2018-19. Also, the amount of electricity used by the railway network is rising due to an increase in the size of the electrified network. Network Rail used 2011-12 traffic and electricity consumption data from its Track Access Billing System (TABS) and applied a series of adjustments before applying the forecast electricity cost per kWh to forecast traffic to produce electric traction cost forecasts by route. Table 16.21 shows Network Rail's income estimate.

Table 16.21: Network Rail's SBP estimated traction electricity charge income for CP5

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Great Britain						
Franchised passenger	229.3	446.1	459.2	495.1	551.0	2,180.7
Freight	6.2	12.7	13.9	15.1	16.2	64.1

[293] Network Rail (2013), Strategic Business Plan for England Wales and Strategic Business Plan for Scotland, pages 54 and page 55 respectively, January 2013, http://www.networkrail.co.uk/publications/strategic-business-plan-for-cp5/

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Open access passenger	3.7	7.1	7.2	7.3	7.3	32.6
England & Wales						
Franchised passenger	215.0	415.5	427.0	462.0	516.7	2,036.2
Freight	5.7	11.6	12.7	13.8	14.8	58.6
Open access passenger	3.7	7.1	7.2	7.3	7.3	32.6
Scotland						
Franchised passenger	14.4	31.6	32.2	33.0	34.3	145.5
Freight	0.5	1.1	1.2	1.3	1.4	5.5
Open access passenger	0	0	0	0	0	0

Note: numbers may not reconcile due to rounding.

16.168 There is significant uncertainty in forecast future energy prices and hence this could impact the actual income level. Crucially, if Network Rail's actual expenditure changes (due to changes in energy prices or indeed other factors) then under the charging arrangements, this will be reflected directly in the charge levels. For example, if Network Rail's electricity costs fall then charges paid by operators will reduce by a commensurate amount, and the converse will apply if electricity costs rise. Therefore, Network Rail's net revenue requirement is unaffected if actual income is ultimately different from the level that we determine. In terms of Network Rail's own use of traction electricity, it will gain or lose if electricity costs in CP5 are lower or higher than we have assumed in our determination.

Our assessment of Network Rail's SBP forecast

16.169 We are content with the general approach taken by Network Rail in calculating EC4T charges income. However, its forecast costs and charges are underpinned by DECC projections from 2011. More recent DECC data from October 2012 are available and should be used (accepting that the DECC projections have a large degree of uncertainty).

16.170 On the basis of these updated DECC projections, Table 16.22 shows our determination for traction electricity charges income. The increase from CP4 is due to higher forecast electricity prices (though lower than that used in the Network Rail SBP) and increased levels of electrified traffic mileage.

Table 16.22: Our determination of estimated traction electricity charge income for CP5

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total CP5
Great Britain						
Franchised passenger	229.3	320.5	350.5	370.9	422.4	1,693.7
Freight	6.2	9.1	10.6	11.3	12.4	49.7
Open access passenger	3.7	5.1	5.5	5.5	5.6	25.3
England & Wales						
Franchised passenger	215.0	297.8	325.9	346.2	396.1	1,581.0
Freight	5.7	8.3	9.7	10.3	11.3	45.4
Open access passenger	3.7	5.1	5.5	5.5	5.6	25.3
Scotland						
Franchised passenger	14.4	22.7	24.6	24.7	26.3	112.7
Freight	0.5	0.8	0.9	1.0	1.1	4.3
Open access passenger	0	0	0	0	0	0

Note: numbers may not reconcile due to rounding.

EC4T charges for CP5

Network Rail's conclusions and our determination

16.171 As part of its PR13 work on setting charges, in September 2012, Network Rail published a consultation on traction electricity & electrification asset usage charges (which covered AC losses) and in November 2012 it published another consultation which covered DC losses[294].

[294] Network Rail (2012). Consultation on charging for losses and regenerative braking for metered operators on the DC network, November 2012, http://www.networkrail.co.uk/WorkArea/DownloadAsset.aspx?id=30064784066

16.172 We welcome the level of engagement shown by the industry. We have noted the responses provided, and fully considered these industry views. We set out Network Rail's main conclusions from February 2013[295], which concluded on both its consultations, and our determination in Table 16.23[296].

16.173 Network Rail also concluded on a number of items which we wished to consult on further as part of our April 2013 consultation on EC4T, in particular in relation to the DSLF (the transmission losses uplift). These policies are not shown in Table 16.23 and instead we discuss these in the next section.

Table 16.23: Network Rail's EC4T conclusions and our determination

Network Rail's conclusions	Our determination
To retain current modelled consumption rates for all operators.	We confirm that modelled consumption rates will not change for CP5.
To make metered billing mandatory for all new electric rolling stock.	This is not a decision for PR13 per se and we will consider its merits and implementation issues further.
To discontinue the Transitional Risk Sharing Mechanism (TRSM)[297].	We confirm this. The mechanism was designed to apply during CP4 only.
To retain the CP4 regenerative braking discounts for modelled operators. To introduce provisions to the EC4T metering rules to allow Network Rail to verify that regenerative braking is being used correctly	We support verification that regenerative braking is being used correctly. Our understanding is that the evidence (from metered services) regarding the rates for regenerative braking is contingent on the assumption that regenerative braking has no associated losses. In the absence of better evidence, we confirm the discounts that Network Rail has proposed, but require that Network Rail carry out more work understanding losses associated with regenerative braking, for implementation as part of PR18.
That freight operators are charged on the basis of the actual electricity costs rather than an index.	We confirm this.

[295] *Traction Electricity and Electrification Asset Usage Charges in CP5 – Conclusions of Network Rail's Consultation*, Network Rail, February 2013, available at http://www.networkrail.co.uk/WorkArea/DownloadAsset.aspx?id=30064784907

[296] The electrification asset usage charge is covered in the relevant section of this chapter.

[297] This temporary mechanism was introduced in CP4 to offer protection to modelled operators who were concerned about the impact of OTM on their modelled bills.

Network Rail's conclusions	Our determination
Change the cost wash-up formula to better reflect tariff structure including the EC4T delivery charge.	We support this, and recognise it as an important complementary measure to freight operators' move to market prices, given that they should benefit from lower off peak prices.
Moving the volume and cost year-end wash-ups and definitions of ESTAs from Schedule 7 to the EC4T metering rules[298], which would be renamed the 'Traction Electricity Rules'.	We confirm this. The rules will apply to all operators using EC4T.

16.174 Network Rail is currently consulting on charges for charter services, including EC4T charges. These are discussed in the charter section of this chapter.

Our consultation and conclusions on EC4T charges for CP5

16.175 We issued a consultation in April 2013[299]. We consulted on the charges for transmission losses, which Network Rail had previously consulted on. We also consulted on changes to the volume wash-up. We explained that we had concluded not to require an uplift to be levied on modelled services to incentivise metering.

16.176 We are grateful for the level of engagement shown by the industry. We have noted the responses provided and considered these in our conclusions[300] . We set out our conclusions, in the same order as the questions we asked in our consultation, in this section.

Process for setting the DSLF (question 1)

16.177 We consulted on whether to amend the traction electricity rules so that any decision to amend the AC and DC DSLF for metered operators would be restricted to ORR, and take place as part of an access charges review. We received a wide variety of responses to this point. There was some support, for example from ATOC, for retaining the current or similar change provision (so that in principle the DSLF could be changed through a majority-endorsed proposal). While several respondents

[298] Further information on the metering rules can be found here http://www.networkrail.co.uk/using-our-network/on-train-metering/

[299] ORR (2013), Consultation on electricity for traction charges for control period 5 (CP5), April 2013, http://www.rail-reg.gov.uk/pr13/PDF/ec4t-consultation-apr-2013.pdf

[300] We will publish the responses to our consultation shortly after the publication of this draft determination at the same web link as our consultation.

supported retaining the same DSLF for the entire control period, others argued strongly for one or more reopeners in various forms.

16.178 The calculation of the DSLF is highly complex and requires an impartial examination of the evidence, and we conclude that this is best achieved by restricting any such amendments to those proposed by ORR. We will do this in accordance with our existing right to modify the rules (set out in the rules at paragraph 11.21 and following). We consider that restricting the right to modify the DSLF in this way reduces uncertainty (by removing the possibility of a succession of operator- or Network Rail-led proposals to change DSLF in individual or all ESTAs) thereby promoting metered billing. This amendment to the rules adds greater certainty versus the CP4 position, while retaining some flexibility, thereby addressing some of the concerns that stakeholders raised.

Our conclusions on the DSLF (question 2)

16.179 We confirm that we will set the DSLF as part of PR13 by ESTA (differentiating between AC and DC). Network Rail argued for a single AC DSLF network wide, on the basis that estimates by ESTA were not sufficiently robust for billing purposes. Our understanding is the differences in estimates by ESTA are based on sound engineering rationale (rather than measurement error), and therefore disaggregated rates should inherently be more cost-reflective than a single aggregate rate. We do not think that this introduces billing complexity over and above that inherent in electricity prices.

16.180 A modified change process will apply to the definition of ESTAs, so that a proposal is subject to vote by Network Rail and all operators (not just those with metered billing, as is the case for other aspects of the rules). Our presumption will be that major new pieces of electrified infrastructure will be established as one or more new ESTAs for CP5 (with ESTA definitions revisited as part of PR18), unless there are sound engineering or practical reasons to conclude otherwise. We are asking Network Rail to improve its evidence on transmission losses associated with regenerative braking, to inform the setting of the DSLF for any new ESTA created in CP5 and for PR18.

16.181 We confirm that we will approve changes to the traction electricity rules so that the DSLF is applied with respect to the gross metered consumption, rather than metered consumption net of metered regenerative braking, as it is currently. Our original proposal was widely endorsed in consultation responses, though both Network Rail

and ATOC highlighted that it would require some changes to the billing system for metered services. (We do not see that it requires any changes to billing for modelled services.) This change in approach better reflects the interaction between regenerated energy and electrical losses.

16.182 We conclude that we will set the DSLF by ESTA for CP5 on the basis of Network Rail's median estimates in its February 2013 conclusions. These are set out in Table 16.24. The definition of ESTAs to which this table applies was set out in annex B of our April 2013 consultation.

Table 16.24: ORR approved DSLF, for application from 1 April 2013

ESTA letters	ORR confirmed DSLF (to be applied on gross metered consumption)
D, F	4.89%
A,B,C,E,I,J,N,S	4.23%
G,H,Q,V	3.86%
O,P,R	3.21%
T	3.41%
M	11.56%
U	17.01%

Note: the ESTAs are as defined in annex B of our April 2013 consultation on electricity for traction charges.

Exposing Network Rail to the volume wash-up (questions 3, 4 and 5)

16.183 We confirm that metered services will be exempt from the volume wash-up even in ESTAs where more than 90% of consumption is metered. There was broad support for this proposal. We consider that this reform may support a business case for OTM. By allocating Network Rail a share of the volume wash-up, the risk to modelled operators of the DSLF being set too low is mitigated.

16.184 We confirm the formulation for Network Rail to share the volume wash-up in each ESTA on which we consulted. In this, Network Rail's share of the wash-up, over and above that associated with its own use, reflects the proportion of costs for which it has control through its management of transmission losses. We illustrated how this might work with some examples in our April 2013 consultation, and we will specify how we propose to contractualise this in our 12 July 2013 consultation on implementation.

16.185 We take the proportion of costs for which Network Rail has control to be equal to the total estimated level of losses in each ESTA (which is the total consumption, gross of losses x DSLF / {1+DSLF}). This is shown in Table 16.25. This formulation, as a function of the DSLF, would apply for the whole of CP5. This is a pragmatic proposal, reflecting the difficulty in calibrating the incentives in the context where most of the electricity consumed is not metered.

Table 16.25: Percentage of gross electricity imputed as being within the control of Network Rail for the purpose of allocating the volume wash-up in CP5

ESTA letters	Network Rail share
D, F	4.66%
A,B,C,E,I,J,N,S	4.06%
G,H,Q,V	3.72%
O,P,R	3.11%
T	3.30%
M	10.36%
U	14.54%

Note: the ESTAs are as defined in annex B of our April 2013 consultation on electricity for traction charges.

16.186 This reform reflects our view on the proportion of costs for which Network Rail has control through its management of electrical losses. This proposal had widespread support from operators. We understand Network Rail's concerns on this reform, particularly around the reduced incentives properties with respect to OTM. However, we consider that these risks are outweighed by the benefits such as increased focus on managing electricity consumption (including that of third parties) and transmission losses, greater certainty for metered operators and mitigated risk for modelled operators.

Partial fleet metering (PFM) (question 6)

16.187 The industry has investigated some of the implications of metering only a sample of the fleet with the aim of reducing the costs associated with OTM. Under this system, the consumption from the services that were not metered would be billed by an

equivalent amount to those metered. We refer to this proposed system of billing as partial fleet metering (PFM).

16.188 Network Rail highlighted the fact that no practical demonstration or testing of PFM has been carried out to date. We think that this is a valid point. The industry needs to be confident that there are genuine cost savings to be made in such an approach, taking into account the costs associated with management of data and Network Rail's billing, before significant investment to enable PFM is committed.

16.189 We think that it is appropriate that the industry, rather than we, devise the contractual framework for PFM, just as it did for OTM, subject to our approval. At the same time, it makes sense for us to have a greater role in specifying how the risk will be shared between OTM, PFM, modelled services and Network Rail through the volume wash-up. This is because the calculation of the DSLF is highly complex, and requires an impartial examination of evidence.

16.190 In principle we think that:

(a) PFM at a level that produces an estimate to a high level of accuracy should have substantially reduced exposure to the volume wash-up; while at the same time

(b) The incentives to meter all services (for example for new rolling stock) should not be undermined, and therefore full metering should have less exposure to the volume wash-up than PFM.

16.191 In our consultation we set out a particular formulation that would meet these criteria and said that we would be open to considering other formulations. ATOC in its response stated that it endorsed the conclusion from analysis of metered data undertaken by Birmingham University that 30% fleet metering should be seen as the level necessary to achieve a reasonable degree of accuracy for energy usage. It said that incentives should be built around achieving this level of PFM.

16.192 We agree that it makes sense to consider incentives with respect to 30% fleet metering (though, perhaps because of differences in the heterogeneity and scale of services, that may not be an appropriate level of fleet metering in all cases). Our proposed formulation shows that at 30% metering, the share of the wash-up would be 24% of that which it would be for equivalent wholly modelled services (i.e. a service with no meters). We confirm that we think that this achieves the right balance of

reduced risk exposure for 30% fleet metering. We are not concluding on a particular formulation as part of PR13.

Network Rail's own consumption of EC4T (question 7)

16.193 There was widespread support for the proposal that Network Rail's metered consumption should be treated on an equivalent basis to other metered consumption subject to certain conditions, for example standards of accuracy, third party audit, and prescribed treatment of new sources of consumption.

16.194 Network Rail's consumption and that of third parties is not currently reflected in the track access contract, though in practice such modelled consumption is treated on a consistent basis to that of modelled consumption by operators in Network Rail's allocation of the volume wash-up. We will contractualise this, so it is reflected in the traction electricity rules in CP5.

16.195 Network Rail's accountability with respect to its metered consumption is not yet comparable to that of services with OTM billing, even recognising that its consumption is on a smaller scale. We will therefore on an interim basis change the contractual formulation so that all of Network Rail's consumption is included in the volume wash-up (comparable to modelled services). When provisions have been added to the traction electricity rules that put Network Rail's metered consumption on an equivalent footing to that of metered services, we will approve its exemption from the volume wash-up. We expect that, under Network Rail's leadership, this can be achieved before April 2015 (in time for the 2014-15 volume reconciliation), so that in practice Network Rail's metered consumption is exempted from the volume wash-up for the whole of CP5.

Electrification asset usage charge

16.196 The electrification asset usage charge (EAUC) recovers the maintenance and renewal costs of electrification assets that vary with traffic. It is a separate charge to that of the VUC because it is only levied on services using electricity for traction.

16.197 Network Rail's electrification assets comprise the AC and DC overhead lines and the DC conductor rail (third rail) systems supported by additional distribution infrastructure. These assets are used by trains to draw traction electricity.

EAUC in CP4

16.198 In CP4 there have been four EAUCs: DC and AC for each of passenger and freight. The charge has been levied per vehicle mile for passenger traffic and per kgtm for freight traffic, reflecting the fact that there is a stronger relationship between electrification costs and vehicle mileage rather than with the amount of traction electricity used.

Calculating the charge in CP5

16.199 Network Rail issued a consultation on its proposals for the EAUC in September 2012[301], and then concluded, including in relation to price lists, in February 2013[302]. These price lists were consistent with those assumed in its SBP. The SBP and consultation explained Network Rail's methodology for calculating the charge and the former provided data on total EAUC income in CP5.

16.200 Network Rail's SBP outlined that the EAUC income forecast was based on:

(a) EAUC cost estimates for AC and DC electrified assets; and

(b) forecast electrified vehicle kilometres for passenger and kgtm for freight by AC and DC.

16.201 The SBP further explained that variable maintenance and renewals costs associated with electrification assets were forecast by Network Rail engineering teams. Network Rail then calculated the electrification asset usage rates by dividing the cost estimates by forecast electrified traffic for the base year 2014-15.These rates were multiplied by the corresponding electrified traffic forecasts for each year of CP5.

16.202 The costs associated with maintenance and renewals of the AC and DC electrification assets differed reflecting the different causes of cost causation.

16.203 In its SBP, Network Rail forecast higher EAUCs in CP5 compared to CP4 because of:

(a) a longer run approach to estimating costs which meant basing cost estimates on a 35 year average rather than a five year average, consistent with the methodology used for the VUC. This approach smoothed out renewal costs that

[301] Network Rail (2012), Traction electricity and electrification asset usage charges full consultation, September 2012, http://www.networkrail.co.uk/WorkArea/DownloadAsset.aspx?id=30064783482

[302] Network Rail (2013), Traction Electricity and Electrification Asset Usage Charges in CP5 – Conclusions of Network Rail's Consultation, February 2013, http://www.networkrail.co.uk/WorkArea/DownloadAsset.aspx?id=30064784907

would otherwise potentially fluctuate markedly due to the age and condition of the electrification equipment;

(b) updating variability assumptions, including a much more granular approach to assessing costs, which resulted in a marked increase in the estimated maintenance and renewal costs that vary with traffic; and

(c) increasing unit cost rates due to, for example, higher metal prices.

16.204 Table 16.26 shows the CP5 rates used in the SBP and the CP4 actual rates.

Table 16.26: EAUC in CP4 and Network Rail SBP

	Passenger		Freight	
(2012-13 prices)	DC (third rail) Pence per electrified vehicle mile	AC (OLE) Pence per electrified vehicle mile	DC (third rail) £ per kgtm	AC (OLE) £ per kgtm
CP4	0.47	1.124	0.0628	0.1178
CP5	2.08	1.96	0.2300	0.3662

Network Rail's SBP forecast

16.205 Network Rail's EAUC income forecast from its SBP is presented in Table 16.27.

Table 16.27: Network Rail's SBP estimated EAUC income

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Great Britain						
Franchised passenger	20.2	20.4	20.6	21.1	22.7	105
Freight	1.0	1.1	1.2	1.3	1.4	6
England & Wales						
Franchised passenger	18.9	19.1	19.3	19.5	21.0	97.8
Freight	0.9	1.0	1.1	1.2	1.2	5.4
Scotland						
Franchised passenger	1.3	1.3	1.4	1.6	1.7	7.3
Freight	0.1	0.1	0.1	0.1	0.1	0.5

Note: numbers may not reconcile due to rounding.

Our assessment of Network Rail's SBP forecast

16.206 We reviewed and challenged the basis of Network Rail's SBP cost estimates and asked Network Rail to make changes to its methodology following significant concerns we had on the approach it had taken. In particular:

(a) we identified a number of inconsistencies, both in the total expenditure and in the way the renewals expenditure was allocated, between the EAUC model and other models Network Rail used to support the SBP;

(b) we had concerns about how total AC maintenance costs were calculated, particularly on the approach taken to OLE maintenance and changes in utilisation;

(c) Network Rail calculated the costs over 35 years, as an average. In its consultation it divided these costs by forecast 2014-15 traffic to derive the EAUC. In its conclusions it instead divided by forecast CP5 average traffic to derive the EAUC. However, as the cost estimates were 35 year average, we were concerned by this inconsistency. We asked Network Rail to calculate the EAUC using average forecast traffic over 35 years instead; and

(d) we noted additional computational errors related to, for example, the way in which Network Rail converted miles to km.

16.207 We also appointed the independent reporter AMCL to review Network Rail's methodology[303]. The reporter made a number of technical recommendations following its review. We asked Network Rail to update its work to take account of our concerns and the reporter's recommendations.

16.208 Network Rail submitted new rates and projected levels of CP5 income to us in May 2013 to take account of our concerns and the reporter's findings. Table 16.28 shows these new rates compared to the CP4 charge and the charge on which Network Rail consulted in comparison to the CP4 position and the position for CP5 as described in Network Rail's SBP.

[303] *Asset Management Consulting Limited (AMCL) (2013), Assessment of EAU charge proposals: PR13 review*, June 2013, available at http://www.rail-reg.gov.uk/pr13/publications/consultants-reports.php.

Table 16.28: Comparison of EAUC in CP4 and Network Rail's calculation for CP5

	Passenger		Freight	
(2012-13 prices)	DC (third rail) Pence per electrified vehicle mile	AC (OLE) Pence per electrified vehicle mile	DC (third rail) £ per kgtm	AC (OLE) £ per kgtm
CP4	0.47	1.24	0.0628	0.1178
CP5 Network Rail SBP	2.08	1.96	0.2300	0.3662
CP5 Network Rail May 2013 update	0.77	1.74	0.0534	0.2664

16.209 Table 16.29 shows Network Rail's forecast income from the EAUC on the basis of its May 2013 update.

Table 16.29: Network Rail's estimated EAUC income for CP5, May 2013 update

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Great Britain						
Franchised passenger	13.3	13.5	13.7	14.1	15.3	70.0
Freight	0.7	0.8	0.8	0.9	1.0	4.2
England & Wales						
Franchised passenger	12.2	12.4	12.5	12.7	13.8	63.6
Freight	0.7	0.7	0.8	0.8	0.9	3.9
Scotland						
Franchised passenger	1.1	1.2	1.2	1.4	1.5	6.5
Freight	0.1	0.1	0.1	0.1	0.1	0.5

Note: numbers may not reconcile due to rounding.

16.210 Given the significant changes in methodology between Network Rail's SBP and its revised submission to us in May 2013, and the implications this had for the unit rate and expected level of CP5 income, we asked Network Rail to update its February

2013 conclusions on the EAUC. Consistent with this, at the end of May 2013, Network Rail issued an addendum to its February conclusions[304].

16.211 Following Network Rail's re-submission, we are satisfied with the approach Network Rail has taken now that it has taken into account the reporter's recommendations and our concerns. Table 16.30 shows our determination of the EAUC rate for CP5, including an adjustment for our determination of efficiency, as set out in the relevant section of this chapter (paragraph 16.38 onwards).

Table 16.30: Our determination of EAUC for CP5

	Passenger		Freight	
(2012-13 prices)	DC (third rail) Pence per electrified vehicle mile	AC (OLE) Pence per electrified vehicle mile	DC (third rail) £ per kgtm	AC (OLE) £ per kgtm
CP5	0.72	1.62	0.0498	0.2482

16.212 Table 16.31 shows our determination of EAUC income for CP5.

Table 16.31: Our determination of forecast EAUC income for CP5

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Great Britain						
Franchised passenger	12.4	12.6	12.8	13.2	14.3	65.3
Freight	0.7	0.7	0.8	0.8	0.9	3.9
England & Wales						
Franchised passenger	11.4	11.5	11.6	11.9	12.9	59.3
Freight	0.6	0.7	0.7	0.8	0.8	3.6
Scotland						

[304] We understand that Network Rail will publish this shortly at http://www.networkrail.co.uk/publications/delivery-plans/control-period-5/periodic-review-2013/pr13-closed-consultations/.

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Franchised passenger	1.0	1.1	1.1	1.3	1.4	6.0
Freight	0.1	0.1	0.1	0.1	0.1	0.3

Note: numbers may not reconcile due to rounding.

Freight only line charge

16.213 The freight only line (FOL) charge was introduced as part of PR08. It was calculated to recover the fixed costs of FOL for the commodities on which it is levied[305]. In legal terms, it represents a mark-up on charges for costs directly incurred on those market segments which we determine to be subject to the charge. Coal for the electricity supply industry and spent nuclear fuel are the two commodities that have paid a FOL charge in CP4.

16.214 In PR13 we have consulted on another mark-up, the freight specific charge (FSC) which we describe in the next section. We consulted on the basis that the FSC would recover all costs that Network Rail could avoid if freight services did not use its infrastructure, which we referred to as freight avoidable costs. In principle the FSC and FOL charge could be treated as a single charge. For reasons of transparency, during the phasing in of the FSC, we agree with Network Rail's conclusion that they should be kept as separate charges for CP5, but we will revisit this at PR18.

16.215 In CP4 the FOL charge has been levied as a flat rate, by commodity, per kgtm on all ESI coal and spent nuclear traffic irrespective of its location on Network Rail's infrastructure: even though the costs relate to FOL only, the charge has applied nationwide[306]. The charge will continue to apply as a flat rate irrespective of the location in CP5.

[305] Freight only lines are defined as lines that would close if freight services ceased to operate. It includes segments of branch lines used only by freight traffic and terminal lines.

[306] With the exception of the year-end reconciliation of EC4T costs and volumes, all charges in CP4 were levied nationwide; principally the rationale for this was to mitigate the complexity of billing.

Network Rail's consultation on freight caps

16.216 As part of its November 2011 consultation on freight caps, Network Rail presented its initial estimates of FOL costs[307], to be used as the basis for calculating the FOL charge in CP5. Network Rail estimated the total cost to be recovered for ESI coal and spent nuclear fuel FOL using broadly the same methodology as that which it developed in PR08. Network Rail based its FOL costs estimates on these two commodities because at the time of its November 2011 consultation these were the only commodities we had assessed as being subject to a FOL charge. To estimate FOL costs, Network Rail:

(a) prepared a list of FOLs;

(b) estimated the total cost of these lines using Network Rail's infrastructure cost model (ICM);

(c) apportioned the costs to each commodity in proportion to the gross tonne miles transported on the FOL by that commodity; and

(d) deducted variable usage costs associated with traffic on the FOL, on the basis that these would be recovered through the VUC.

16.217 We mandated the reporter Arup to review the calculations that Network Rail presented in its freight caps consultation, including that of the FOLs. Arup's report is published on our website[308]. Network Rail took the findings into account in its March 2012 conclusions.

16.218 Network Rail's March 2012 conclusions on FOL costs were presented in 2011-12 prices and end of CP4 efficiency, whereas the numbers in this chapter are presented in 2012-13 prices and end of CP5 efficiency, so are not directly comparable.

Estimating freight avoidable costs

16.219 In May 2012 we consulted on introducing a new charge that we called a freight specific charge (as well as consulting on setting a cap on the average freight VUC). This charge would recover what we referred to as freight avoidable costs that were not recovered from other charges. As part of this work, we reviewed Network Rail's

[307] *Freight caps – consultation on variable use charge (VUC) and freight only line charge initial cost estimates*, Network Rail, November 2011

[308] Arup (30 March 2012), AO/027: Review of Analysis in Network Rail's 'Freight Cap' Consultation Report, http://www.rail-reg.gov.uk/upload/pdf/review-analysis-nrs-freight-cap-consultation.pdf

estimates for FOL costs, taking account of the independent reporter's review, and said that we were broadly content with Network Rail's approach and estimates of FOL costs.

16.220 As part of the work on the freight specific charge, Network Rail commissioned consultants L.E.K to estimate freight avoidable costs. L.E.K's report was published by Network Rail in October 2012, and included refined estimates of costs for FOLs[309]. Network Rail used L.E.K's refined estimates in its forecasts of income from the FOL charge in its SBP.

Network Rail's SBP forecast

16.221 Network Rail's SBP income forecasts for the FOL charge were based on the assumption that it would be levied on ESI coal and spent nuclear fuel traffic only. These forecasts are presented in Table 16.32.

Table 16.32: Network Rail's SBP estimated FOL charge income for CP5

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Great Britain	5.9	5.9	5.9	6.0	6.0	29.7
England and Wales	4.8	4.8	4.8	4.8	4.8	24.0
Scotland	1.1	1.1	1.1	1.1	1.1	5.50

Note: numbers may not reconcile due to rounding.

Calculating and phasing in changes to the FOL charge

16.222 In January 2013 we concluded on our consultation on the freight specific charge and a cap on the VUC. As part of this, we concluded on a cap on a freight specific charge. On the basis of a detailed assessment of the markets for different commodities, we concluded that the mark-up would apply to ESI coal, spent nuclear fuel and iron ore. We also announced that we would consult on an equivalent charge for biomass, and went on to do so in February 2013.

[309] L.E.K.'s report on freight avoidable cost, October 2012, can be accessed at http://www.networkrail.co.uk/WorkArea/DownloadAsset.aspx?id=30064784085.

16.223 Network Rail issued a consultation in February 2013[310] with the purpose of updating its charging calculations to take account of our January 2013 conclusions.

16.224 The cost estimates took account of L.E.K's refinements (which had already been used in the SBP income forecasts), but Network Rail also stated its intention to update the cost estimates for some further changes that followed the SBP, and had commissioned L.E.K to undertake an update of its freight avoidable cost estimates.

16.225 Network Rail presented the FOL charges, as opposed to estimates of total FOL costs, for the first time. Network Rail calculated these by dividing its cost estimates by its forecast of average CP5 traffic levels for the relevant traffic.

16.226 Network Rail highlighted an error in the PR08 calculation of the FOL charge for spent nuclear fuel, resulting from incorrect assumptions it had made regarding traffic levels in CP4. Correcting this error, Network Rail calculated that the CP5 FOL charge should be around seven to eight times higher than the CP4 charge of £5.34/kgtm.

16.227 To give the nuclear industry time to adjust to such a significant increase, Network Rail proposed phasing in the increase in the charge for spent nuclear fuel in line with its proposal for phasing in the freight specific charge, no increase for the first two years of CP5, and then with the charge rate increasing to 20%, 60% and 100% of the full charge rate over the last three years of CP5.

16.228 In its consultation, Network Rail proposed to phase in the FOL charge for iron ore and potentially biomass over the same time frame and using the same profile as for the freight specific charge, i.e. the charge would be introduced in April 2016 for the last three years of CP5 (2016-17 to 2018-19), with the charge increasing to 20% of the full charge rate, to 60% and 100% respectively.

16.229 Network Rail published its conclusions to its February consultation on 23 April 2013[311]. It concluded on FOL charges for ESI coal, spent nuclear fuel, iron ore and also biomass. Table 16.33 below sets out Network Rail's calculation of the charge for each of these commodities. Table 16.34 shows Network Rail's forecast of FOL revenue for each of these commodities, using the SBP freight traffic forecasts.

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[310] *Network Rail's freight specific charge consultation*, published February 2013, can be accessed at http://www.networkrail.co.uk/WorkArea/DownloadAsset.aspx?id=30064784848.

[311] http://www.networkrail.co.uk/Conclusions-on-the-phasing-of-freight-specific-charge.pdf

Table 16.33: Network Rail April 2013 conclusions on FOL charge (£ per kgtm)

Commodity	2014-15	2015-16	2016-17	2017-18	2018-19
ESI Coal	£0.5507	£0.5507	£0.5507	£0.5507	£0.5507
Spent nuclear fuel	£5.3436	£5.3436	£6.0446	£18.1337	£30.2228
Iron ore	£0.0	£0.00	£0.1665	£0.4996	£0.8327
Biomass	£0.00	£0.00	£0.061	£0.1817	£0.3029

Table 16.34: Network Rail April 2013 forecast income from FOL charge (£ million)

Commodity	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
ESI coal	£3.89	£3.89	£3.89	£3.89	£3.89	£19.45
Spent nuclear fuel	£0.14	£0.14	£0.16	£0.49	£0.82	£1.75
Iron ore	£0.00	£0.00	£0.03	£0.08	£0.13	£0.24
Biomass	£0.00	£0.00	£0.12	£0.35	£0.58	£1.05

Note: numbers may not reconcile due to rounding.

Our assessment of Network Rail's forecast

16.230 Network Rail's methodology for calculating FOL costs was established in PR08, and subject to independent reporter review in 2012. We are content with its approach and use its revised April 2013 estimates as the basis of our determination of forecast income for this charge.

16.231 Network Rail has converted these costs into a charge by dividing by forecast relevant traffic for CP5. We have been concerned that the costs and traffic levels might be calculated on an inconsistent basis, leading to a distortion in the charge, but have now satisfied ourselves that this is not a material consideration. In particular, Network Rail's cost estimates were based on FOLs for a particular point in time (start of CP5), whereas its traffic is CP5 average, but as the forecast for CP5 traffic has been flat, this is not material.

16.232 It is regrettable that the correct traffic levels for spent nuclear fuel were not applied in PR08 to calculate the appropriate charge, resulting in a substantial error in the scale

of the CP4 charge. We think it is appropriate to correct the error now, in order to ensure that the charges send the correct signals to Network Rail and to those hauling spent nuclear fuel. But the scale of the increase means that, in order to allow time for users to adapt to it, we consider Network Rail's approach to phasing in the large increase in charge which results from correcting this error to be appropriate.

16.233 We have decided not to levy a FOL charge on biomass in CP5. The commodities to which the FOL charge applies are consistent with those to which the freight specific charge applies, and, as explained in paragraph 16.247, we have decided not to levy a freight specific charge for biomass in CP5. As part of our wider work in the beginning of CP5 to improve our understanding of costs and how they should be reflected in the structure of charges, we will ensure we involve biomass stakeholders.

16.234 We propose to work further with the industry, and with customers for biomass haulage, in CP5 in order to understand better the costs they generate on the network and how this should be reflected in charges in CP6.

16.235 Table 16.35 shows our determination of forecast FOL charge income for CP5, including adjustment for our determination of efficiency, as set out in the relevant section of this chapter (paragraph 16.38 onwards). In the case of spent nuclear fuel, we have not applied the efficiency overlay to the rollover of the CP4 charge. Table 16.36 shows our determination of the estimated FOL charges for CP5.

Table 16.35: Our determination of forecast FOL charges income for CP5

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Great Britain						
Freight	3.7	3.7	3.8	4.1	4.4	19.7
England & Wales						
Freight	2.9	2.9	3.0	3.3	3.6	15.7
Scotland						
Freight	0.8	0.8	0.8	0.8	0.8	4.0

Note: numbers may not reconcile due to rounding.

Table 16.36: ORR estimation of FOL charge for CP5 (£ per kgtm)

Commodity	2014-15	2015-16	2016-17	2017-18	2018-19
ESI Coal	0.50	0.50	0.50	0.50	0.50
Spent nuclear fuel	5.34	5.34	9.77	18.64	27.50
Iron ore	0.00	0.00	0.15	0.45	0.76

Freight specific charge

Background

16.236 We are keen to improve the extent to which the charges that Network Rail's customers pay reflect the costs they impose on the network. More cost reflective prices help to drive efficiencies and send better signals to Network Rail and its customers for the efficient provision and use of access to the network, which is itself a scarce resource. More cost reflective charges also improve transparency – making it clearer who pays for what and what they receive in return. In our view, the new freight specific charge or FSC which we concluded on in January[312] is an important step in improving value for money.

16.237 Some of the public financial support for the rail industry benefits rail freight. All train operators pay a variable usage charge for each vehicle they run on the network. But only franchised passenger train operators pay FTAC, which contributes to infrastructure costs beyond the costs generated simply by running additional vehicles. In 2011-12 passenger train operators paid £887m to Network Rail in fixed charge. The comparable charge that freight operators pay (the FOL charge) amounted to around £4m in 2011-12.

16.238 There are good reasons to subsidise rail freight. This is because there are wider economic and social benefits of moving freight by rail rather than road. Without rail freight, there would have been an additional 6.7 million road journeys in 2007-8. Switching from road to rail reduces CO_2 emissions by 70% per tonne moved and generates benefits in terms of reduced road congestion equivalent to 28 pence per HGV mile avoided. This is why the UK and Scottish governments have consistently

[312] *Our conclusion on the variable usage charge and freight specific charge*, published January 2013, can be accessed at http://www.rail-reg.gov.uk/pr13/PDF/freight-conclusions-jan-2013.pdf

supported rail freight, and have funded substantial investments to improve rail freight infrastructure - for example gauge enhancements on Felixstowe to Nuneaton and Southampton to West Midlands to allow large containers to be carried by intermodal traffic and the Grangemouth branch improvement.

16.239 But the wider economic and social benefits that underlie the subsidy to rail freight are generated principally when freight that would otherwise have travelled by road travels by rail. To date, rail freight has benefitted from subsidy, even where, as is the case for ESI coal, spent nuclear fuel and iron ore, it cannot easily or economically switch to road. By introducing a freight specific charge for these commodities, we will increase the extent to which they contribute to the costs that freight imposes on the rail network. And in doing so, we will reduce the overall size of the subsidy that Network Rail receives (through grant directly from government in lieu of franchised passenger operators FTAC) and the FTAC paid by franchised passenger train operators.

Our January 2013 decisions on the FSC

16.240 Following extensive consultation with our stakeholders, we concluded, in January, that we would introduce a new charge, the FSC, in CP5. The purpose of the charge is to recover infrastructure costs caused by freight operating on the network that are not currently recovered through other freight charges. The introduction of this charge means that rail freight will pay a greater contribution to the costs that it imposes on the network.

16.241 The FSC is to be levied as a mark-up on the variable usage charge and recover freight avoidable costs. The Access and Management Regulations establish the legal framework for levying a mark-up. In addition to this legislation, we also must consider any proposed mark-up against our statutory duties which are primarily set out in section 4 of the Railways Act 1993. We set out the legal test that we applied in reaching our decision on the freight specific charge in our January decisions document.

16.242 The FSC will improve the extent to which the charges that freight operators pay reflect the costs they impose on the network. To be consistent with the Access and Management Regulations the charge is recovered from the commodity markets assessed by us to be able to bear a mark-up on the variable usage charge. We undertook extensive market analysis to inform our decision making process.

16.243 In January we concluded that the charge would apply as follows in Table 16.37.

Table 16.37: Application of the FSC to commodities

Commodity	Conclusion
Electricity supply industry coal	Yes
Other coal	No
Spent nuclear fuel	Yes
Iron ore	Yes
Biomass	Make decision as part of PR13, and consult on levying the charge on biomass.
Other commodities	No

16.244 Our January conclusions document did not set freight specific charges as such rather it set a cap on the FSC i.e. the maximum level of the charge to be levied in CP5, by commodity. We also concluded that the unit of the charge would be a charge per thousand gross tonne mile (per kgtm), reflecting the fact that the two principal drivers of freight avoidable costs are weight and distance travelled. The caps are shown in Table 16.38.

Table 16.38: FSC cap by commodity

Commodity	FSC cap (per kgtm)
ESI Coal	£4.04
Spent nuclear fuel	£11.64
Iron Ore	£2.96

16.245 We indicated in January that further work would be required in order to set charges and asked Network Rail to take this work forward.

16.246 In order to address concerns raised during our extensive stakeholder engagement, in particular about the ability of some users to cope with the imposition of this new charge, we also determined that the FSC would be phased in over the course of CP5 to allow freight businesses time to adapt.

Extending the FSC to biomass

16.247 As part of the market assessment undertaken ahead of our January conclusions document we began the process of considering whether or not the charge should apply to trains carrying biomass. We had previously said we would not levy a charge on biomass but would revisit the policy to coincide with DECC's recalculation of subsidy from 2017. We changed this stance in our January decision document because respondents to the May consultation had explained that investments made now would be subject to the existing subsidy regime, not a 2017 revision, and they wanted certainty about the charging regime to inform imminent investment decisions. We subsequently consulted on a proposal to introduce the FSC for biomass, setting out what this could be.

16.248 While some stakeholders recognised the potential for cross subsidy if biomass traffic were excluded from the charge, there was strong opposition to the charge. Issues raised included concern about the emerging nature of the market, the consequential lack of robust traffic forecasts and the potential for the charge to adversely impact the appetite to invest in the sector.

16.249 One stakeholder told us that, while it understood the need for the access charges it paid to be cost reflective, it was concerned that it had not been much involved in the process by which the cost estimates had been arrived at. The same stakeholder was also concerned that contract for difference strike prices, which in principle could have reflected the FSC, had now been fixed by DECC until 2019, so that the new charge could not be passed on, with the potential to affect future investment decisions. They noted that a charge introduced in PR18 would not be subject to the same difficulty (as it would not come until 2019), and that this would also allow time for further discussions about the appropriate level of cost for recovery through the charge.

16.250 We note that biomass is an emerging market where there is considerable uncertainty. Our analysis suggests that a charge of the scale being considered would represent only a small proportion of the delivered price of biomass; less than 1%, but relevant experts advise that industry margins are low and even a small increase in the delivered price could be influential to market development. As a result we have concluded that biomass will not be subject to the freight specific charge in CP5. As part of our wider work in the beginning of CP5 to improve our understanding of costs

and how they should be reflected in the structure of charges, we will ensure we involve biomass stakeholders.

16.251 The consultation responses and our further analysis of the issues are described in annex B.

Structure of this section

16.252 In the remainder of this section on the FSC, we describe further work that has been undertaken since our January conclusions document was published, discuss the implications of this further work for the FSC, determine the level of the FSC for CP5 and estimate the revenues that result from the charge being levied.

Further work carried out by Network Rail following our January decisions

16.253 The FSC will be set by reference to freight avoidable costs or FACs. We define FACs as the infrastructure costs that would be foregone if commercial freight services were no longer to use the network (where commercial freight services are those run for third party customers, as opposed to the infrastructure trains providing services to Network Rail).

Original estimate of freight avoidable costs

16.254 In 2012, Network Rail commissioned consultants L.E.K to estimate freight avoidable costs. L.E.K engaged extensively with the rail freight industry and used Network Rail modelling and analysis in order to estimate freight avoidable costs. L.E.K also developed an allocation of this cost between freight commodities (or market segments). We used this work as an input to our decisions on capping the FSC in January. The caps were set to reflect the low end of the range of our estimate of freight avoidable cost, which consisted of L.E.K's analysis adjusted by us following our own analyses and input from the reporter.

16.255 In anticipation of setting charges, we asked Network Rail to update its L.E.K. estimates to take account of recommendations made by our Reporters and to refine a number of cost estimates within its analysis. Specifically we asked Network Rail to:

(a) follow the recommendations of Arup in revising our estimate of variable usage costs (correcting its treatment of non-commercial freight);

(b) make other refinements proportionate to their impact on the determined charge, in particular allocation of costs associated with the possessions regime (Schedule 4) with respect to spent nuclear fuel;

(c) update the unit costs consistent with the SBP and other best estimates (rather than low range estimates) of freight avoidable costs; and

(d) refine the allocation of variable usage costs and netting off of other variable charges (with updated charge estimates).

L.E.K. scope of work

16.256 Network Rail therefore re-commissioned L.E.K to update its earlier work to take account of our comments and in particular to:

(a) incorporate changes in the underlying growth forecasts to reflect the SBP traffic forecasts;

(b) incorporate Network Rail's latest VITSM run in line with Arup's recommendations;

(c) update for the latest view on enhancements; and

(d) consider incorporating other changes as recommend by ORR / reporters where appropriate.

16.257 As part of re-commissioning L.E.K., Network Rail consulted on its proposed approach to the update as part of an industry letter in February 2013 on various freight charges (including a possible approach to calculating FOL charges for biomass).

16.258 L.E.K's updated report can be accessed via Network Rail's periodic review 2013 webpage[313] and is discussed further below.

L.E.K. updated estimate of FACs

16.259 A key concern about the original estimate of FACs reported by L.E.K previously was that the range of potential costs was extremely wide. The effect of the adjustments made in the final report is to narrow the range significantly; the low end increases by 41% and the high end reduces by 14%. L.E.K's revised estimate of gross FACs (prior to revenue from other charges being netted off) is £215-£428m per annum. This is a 35 year average figure, and accounts for forecast in freight traffic[314].

16.260 The principal drivers of the increase in L.E.K.s freight avoidable cost estimates are:

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[313] http://www.networkrail.co.uk/publications/delivery-plans/control-period-5/periodic-review-2013/pr13-closed-consultations/.

[314] This is consistent with the calculation of costs for other charges, so that renewal costs are averaged over a long time period.

(a) increases in track maintenance and renewal cost estimate as a result of new VTISM results supplied by Network Rail: this increased the track variable usage cost estimate by £78 million at the low end of the range and £36m at the high end.

(b) the inclusion of redundant freight property assets cost estimate, this increased the redundant freight property asset cost range by £22m at the high end of the freight avoidable cost estimate range.

Increase in track and maintenance variable usage costs

16.261 The increase in track maintenance and renewal costs is as a result of Network Rail re-running its VTISM model reflecting recommendations made by Arup. In its initial estimate L.E.K used different VTISM model runs for its low and high case estimates. The low case estimate was based on marginal increases in traffic, whilst the high case run was based on the complete removal of traffic from the network. These produced very different results which L.E.K. was unable to reconcile and so used only the low case run to estimate track maintenance and renewal variable costs.

16.262 Arup found Network Rail's use of VTISM to be robust, including the high case estimate and identified a number of factors that led them to suggest a VTISM variable usage cost estimate range of 10% to 30% of the central estimate. Arup recommended that both the low and high cost VTISM run estimates should be used. In line with this recommendation L.E.K. adopted Arup's recommended methodology for both ends of the cost estimate range and applying this to Network Rail's updated central estimate of c. £165m produced an a updated track variable usage cost estimate range of £148-£214m[315].

Inclusion of redundant freight property cost estimates

16.263 In its initial analysis L.E.K. was unable to provide an estimate of the avoidable cost associated with the potential sale of redundant freight property assets. In our January conclusions document we set our own estimate of potential property sales as being in the range of £0-£22m. Network Rail considered this a reasonable, although possibly, conservative estimate. L.E.K. has therefore included £22m of property sales to the high end of its freight avoidable cost estimate range.

[315] Note that this is track variable costs only (i.e. it excludes civils and signalling costs) and so is not directly comparable with the variable costs presented in later tables.

Other updates with a less significant impact on the freight avoidable cost range

16.264 Other updates that have had a less significant impact on the freight avoidable costs estimate include:

(a) the impact of using Network Rail's SBP traffic forecast rather than the Initial Industry Plan (IIP) forecast as used in the original study. This had only a moderate effect on costs;

(b) revised FOL costs, which were reduced by £3m (net of variable usage costs) as a result of Network Rail's new SBP costs estimates and variable usage charges;

(c) other changes to variable usage costs reflecting Network Rail's revised SBP variable usage cost estimates for civils and signalling, reducing the civils costs estimate from £12m to £9m and signalling cost estimate from £3.5m to £3m. The new SBP traffic forecast implied a 13% increase in the uplift applied to these base costs resulting in an additional £2-3m in the freight avoidable costs estimate;

(d) Network Rail review of both Strategic Freight Network (SFN) and non-SFN projects resulted in a £7m decline in the low case estimate and £1m decline in the high case estimate for redundant enhancement costs; and

(e) changes to consequential costs reductions estimates, the principal impact on this cost category arises from a reallocation of Schedule 4 costs with respect to spent nuclear fuel, this resulted in a £4m reduction to the low end of the consequential cost reduction estimate range.

16.265 L.E.K's updated estimate of gross freight avoidable costs is provided in Table 16.39.

Table 16.39: L.E.K's updated estimated gross freight avoidable cost over 35 years (2011-12 prices)

Cost category	L.E.K. initial estimates (£m)		Updated estimates (£m)		Change (£m)		Change (%)	
	Low	High	Low	High	Low	High	Low	High
FOL costs	14	21	11	19	(3)	(3)	(21%)	(16%)
Redundant freight assets costs	6	12	5	32	(1)	20	(21%)	175%

Cost category	L.E.K. initial estimates (£m)		Updated estimates (£m)		Change (£m)		Change (%)	
Variable usage costs	96	215	173	249	77	35	80%	16%
Redundant enhancement costs	64	87	56	86	(7)	(1)	(12%)	(1%)
Consequential costs reductions	58	77	55	78	(3)	1	(5%)	1%
Consequential cost increases	(88)	(39)	(88)	(39)	-	-	-	-
Network Rail staff costs	4	5	4	5	-	-	-	-
Total	**152**	**377**	**215**	**428**	**63**	**51**	**41%**	**14%**

Note: numbers may not reconcile due to rounding.

16.266 Many of the changes made by L.E.K in the final version of its report reflect suggestions and/or adjustments that we made to its work previously. We note however that L.E.K has not adopted all of the changes that we proposed e.g. the changes that we suggested related to the costs of acquiring additional engineering trains to support Network Rail's own maintenance renewal and enhancement of the network has not been adopted. However, taking the changes made to the report in the round we have concluded that it is sufficiently robust for use in setting charges.

16.267 From its updated estimate of gross FACs L.E.K deduct revenue accruing from other charges on the freight industry. The most significant current charge is the variable usage charge which generates £63m p.a. of revenue from freight operators. After adjustment for revenue generated by all other charges the Network Rail/L.E.K updated estimate of net FACs is £130m to £311m per annum.

16.268 Using this estimate of net FACs Network Rail/L.E.K's analysis suggests that the FSC should be set at: £2.08 per kgtm for coal, £1.53 per kgtm for iron ore and £5.99 per kgtm for spent nuclear fuel.

Phasing in the FSC

16.269 In our January 2013 document we concluded that the charge would not be introduced until 2016 and then would be phased in gradually over the course of the remainder of

CP5. We provided an indicative profile for phasing and asked Network Rail to consult on phasing in of the charge which it did in February 2013.

16.270 Network Rail's conclusions were published on 23 April 2013[316]. In this document Network Rail confirmed its proposals to levy no charge in the first two years of CP5 and then to phase in the FSC at 20%, 60% and 100% of the full charge rate over the last three years of CP5 (i.e. no change in 2014-15 and 2015-16 and phasing in between 2016-17 and 2018-19). This would have had the effect of setting the charge to equate to the annual caps as set out in Table 16.40 consistent with our conclusions in January.

Table 16.40: Annual caps on the FSC in CP5 (2011-12 prices)[317]

Commodity	FSC cap, 2014-15	FSC cap, 2015-16	FSC cap, 2016-17	FSC cap, 2017-18	FSC cap, 2018-19
Phasing	0%	0%	20%	60%	100%
ESI coal	£0.00	£0.00	£0.80	£2.40	£4.04
Spent nuclear fuel	£0.00	£0.00	£2.15	£6.98	£11.64
Iron ore	£0.00	£0.00	£0.59	£1.77	£2.96

Our conclusions on the FSC

The level of the FSC in CP5

16.271 In January we set the caps on the FSC on a conservative basis i.e. at the low end of the adjusted range of net FACs. Consistent with this decision, charges for CP5 will also be set on a conservative basis. Our start point for this is the revised estimate of net FACs calculated by Network Rail/L.E.K.

16.272 However we are very conscious of the point made by many freight stakeholders that freight charges must be viewed in their entirety not on a charge by charge basis. In reaching our decision we have had regard to the cumulative impact on freight stakeholders of the various changes to freight charges. In reaching conclusion on the

[316] http://www.networkrail.co.uk/Conclusions-on-the-phasing-of-freight-specific-charge.pdf.

[317] This table sets out the caps on which we concluded in January 2013, using the phasing on which Network Rail concluded.

FSC we have had regard to the requirements of the Access and Management Regulations and also considered our broader statutory duties.

16.273 In this context, our review of charges for CP5 has resulted in a significant number of changes many of which increase the overall quantum of charges imposed on the freight sector.

16.274 We have reviewed the overall package of changes to freight charges and the likely impact of this package on freight operators and those of their customers who would be most affected. As part of this we have considered whether the package in the round alters the analysis of the FSC that we undertook ahead of our January conclusions document. In this context we consider that the increase in variable usage charges implied by the work that Serco undertook for Network Rail is material to the levying of the FSC. This is because the freight commodities that we are levying the FSC on will also face larger than average increases in variable usage charge. Although we anticipate that the FSC will, in large part, be passed on to freight customers, we have given weight to the fact that the freight commodities paying the FSC will need time to adapt to the increases in variable usage charge and FSC as a package.

16.275 In light of this we have used our judgement to conclude that the FSC should be set in CP5 at a level that is both below the caps established in January and the levels implied by Network Rail/L.E.K's latest analysis. The FSC for CP5 will therefore be levied as set out in Table 16.41.

16.276 We have taken the view that although the FSC should in principle be levied at a rate that reflects Network Rail/L.E.K's latest analysis, taking into account the changes to variable charges, even introducing this through CP5 on the basis of the gradual profile we had concluded should be adopted in our January decision would have an unacceptably high impact on some users. We considered whether we should phase the FSC in over a 10 year period (through CP5 and CP6) but concluded that we should not seek to constrain our thinking in PR18 in this way. Without in any way seeking to constrain our thinking in PR18, we therefore concluded that by the time it is fully implemented in CP5 (and we discuss phasing below) the FSC should represent 50% of what its full level would be based on the latest Network Rail/L.E.K analysis.

Table 16.41: Our conclusions on the FSC for CP5, prior to phasing (2012-13 prices)

Commodity	FSC charge (per kgtm)
ESI Coal	£1.04
Spent nuclear fuel	£3.00
Iron Ore	£0.76
Other commodities	£0.00

16.277 Setting the FSC at this level reflects movement towards greater cost reflectivity; freight will pay a greater share of the costs it imposes on the railway. However, the increase in the share of its costs that are recovered through charges is set to reflect our judgement of the appropriate balance of our statutory duties. On the one hand we have considered the need to promote efficiency and economy and have had regard to the funds available to the Secretary of State; on the other we have considered the need to both protect the interests of freight operators and their customers, to enable them to plan their businesses and our desire, and that of the governments, (reflected in their guidance to us) to facilitate a strong freight sector.

Phasing in the FSC during CP5

16.278 When we announced our intention to introduce the FSC earlier this year we also concluded that the charge should be phased in over the course of CP5. Network Rail's conclusions on phasing are that it will follow the profile zero per cent in years one and two, 20% in year three, 60% in year 4 and 100% in year 5. We have decided that this phasing profile should be retained in order to allow businesses time to adapt to the introduction of the charge. But as noted above 100% implementation now refers to full implementation of the CP5 level of the charge, which represents only 50% of the full charge implied by the latest Network Rail/L.E.K analysis. The FSC will therefore be phased in as set out in Table 16.42.

Table 16.42: Our conclusions on the FSC by year for CP5 (£ per kgtm, 2012-13 prices)

Commodity	FSC charge, 2014-15	FSC charge, 2015-16	FSC Charge, 2016-17	FSC Charge, 2017-18	FSC Charge, 2018-19
Phasing	0%	0%	20%	60%	100%
ESI coal	£0.00	£0.00	£0.21	£0.62	£1.04

Commodity	FSC charge, 2014-15	FSC charge, 2015-16	FSC Charge, 2016-17	FSC Charge, 2017-18	FSC Charge, 2018-19
Spent nuclear fuel	£0.00	£0.00	£0.60	£1.80	£3.00
Iron ore	£0.00	£0.00	£0.15	£0.46	£0.76

16.279 A significant benefit of our analysis to support the FSC is that it has given us a much clearer picture of the level of subsidy that Government provides to freight which can then be weighed against the broader benefits that the freight sector delivers.

16.280 We have worked with freight operators to secure commitment to reducing the avoidable costs that they impose on the network, including insufficient use of capacity. We expect to do more work with Network Rail, with freight operators and freight customers early in CP5 to get a better understanding of freight costs, to better inform PR18. In our forthcoming review of the structure of charges, working with the industry, we expect to consider how best to reflect the impact of freight traffic on the network in charges. We will also seek to move further towards our goal of greater cost reflectivity and understand more clearly the range of options that the freight sector has to reduce its impact on the network.

Our assessment of Network Rail's SBP forecast

16.281 Network Rail's Strategic Business Plan did not include an income forecast for the freight specific charge because at the time of its publication no decision on its introduction had been made. Network Rail has since estimated revenue from the charge but our determination means that these estimates will also overstate the charge. Table 16.43 therefore sets out our estimate of revenues from the charge using Network Rail's SBP traffic forecast.

Table 16.43: Our determination of FSC income in CP5

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Great Britain						
Freight	0	0	1.5	4.5	7.5	13.5
England & Wales						
Freight	0	0	1.2	3.5	6.0	10.7
Scotland						
Freight	0	0	0.3	0.9	1.6	2.8

Note: numbers may not reconcile due to rounding.

Fixed track access charge

16.282 The fixed track access charge (FTAC) or fixed charge recovers Network Rail's residual revenue requirement (often termed the net revenue requirement). The net revenue requirement is the revenue required by Network Rail to run its business, after accounting for the income received from variable track access charges and regulated station charges, other single till income and the network grant. FTAC is only paid by franchised passenger operators, although we will shortly consult on options to allow passenger open access operators greater access to the network in return for some contribution to fixed costs.

16.283 We consider that the way in which the fixed charge is allocated between franchised passenger train operators is important, and that Network Rail should make the charge as cost reflective as possible so that costs are recovered from those that cause them.

Calculating the charge in CP4

16.284 The framework for calculating and allocating FTAC was last reviewed as part of PR08 for CP4 when we accepted Network Rail's proposal to disaggregate the residual net revenue requirement on a more cost reflective basis.

16.285 In calculating FTAC for CP4, Network Rail calculated the net revenue requirement for England and Wales and separately for Scotland. In Scotland the net revenue requirement, less the network grant from Transport Scotland, became the total FTAC which was then allocated to the Scottish franchised operator.

16.286 For England and Wales, the same approach was applied; the net revenue requirement, less the network grant from Department for Transport (DfT), became the total FTAC which was then allocated to the franchised passenger operators.

16.287 Network Rail then allocated FTACs to operators using the following steps:

(a) use the infrastructure cost model (ICM) to calculate and allocate the relevant costs and income to each of the strategic route sections (SRS). Some common costs types, for example for the British Transport Police, were still allocated between franchised passenger operators at a national level;

(b) use the most relevant traffic metrics (e.g. train km, vehicle km, tonne km, electric train km) to divide each cost item between the operators using, or expected to use, that route section;

(c) use appropriate metrics to allocate national level costs to individual franchised passenger operators;

(d) identify any elements that should be ring-fenced to specific operators, for example, costs related to particular enhancement deals; and

(e) sum the elements for each TOC to give the level of FTAC by operator.

16.288 RAB related costs, such as amortisation and rate of return, also contributed to Network Rail's net revenue requirement and were therefore allocated to franchised passenger operators through FTAC. For CP4, we accepted Network Rail's suggestion that the allocation of the RAB related costs should remain high level based on SRS level percentage splits of the long run renewals forecast. These costs were then allocated to operators based on the appropriate traffic metric.

16.289 The above approach resulted in the net revenue requirement for Scotland being split between network grant from Transport Scotland and the ScotRail FTAC only. Similarly, the net revenue requirement for England and Wales was split between the network grant from DfT and all franchised passenger operators except ScotRail as the latter is specified by Transport Scotland and all the others by DfT.

16.290 An effect of the CP4 allocation approach was that, ScotRail paid no FTAC for usage of the network in England and Wales, and cross-border services running into Scotland paid no FTAC for their use of the Scottish network.

Calculating the charge in CP5

16.291 As part of the process for setting charges in CP5, we indicated to Network Rail that further progress should be made towards cost reflective allocation[318] and transparency. Network Rail therefore developed proposals for consultation with stakeholders[319]. In this consultation we asked Network Rail to:

(a) explore greater transparency in the allocation process e.g. through an increased level of disaggregation at route level[320]; and

(b) improve transparency by explaining the allocation of the charge between England and Scotland.

16.292 In its consultation, Network Rail proposed to increase the level of disaggregation by building upon the approach taken to calculate CP4 FTAC. The key differences for CP5 were that, the majority of cost and income forecasts have been developed at a route level and not by SRS, though some high level allocation was retained. Secondly, reflecting devolution to routes, Network Rail proposed that the FTAC should be split by route before being allocating to franchised passenger operators.

16.293 In relation to the RAB, Network Rail suggested that the approach should remain high level with allocation to routes based on route level percentage splits of the long run renewals forecast. In its consultation, Network Rail also made the following proposals:

(a) to retain the current approach on the allocation between England, Wales and Scotland;

(b) to calculate FTACs based on vehicle kms for remapped franchises in CP5;

(c) that facility charges should remain in place until the end of the agreed period as opposed to being incorporated into FTACs at control period changes;

(d) that the Welsh Valley Lines electrification project be funded through a facility charge via the operators benefitting from the investment rather than through an increased FTAC;

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[318] *Setting the financial and incentive framework for Network Rail in CP5*, ORR, May 2012, available at http://www.rail-reg.gov.uk/pr13/publications/financial-incentives.php

[319] *Fixed track access charges consultation*, Network Rail, November 2012, available at http://www.networkrail.co.uk/WorkArea/DownloadAsset.aspx?id=30064784245

[320] Route refers to Network Rail's ten devolved operating routes.

(e) that Crossrail costs would be treated as a franchise re-mapping in order that FTAC is paid by Crossrail services upon their introduction;

(f) to deduct TOC-specific facility charges and stations' long term charges from the specific operators' FTACs, to which they relate; and

(g) to provide an indicative split of the England and Wales RAB by route, which they expected to include as a memorandum item to the regulatory accounts in CP5.

Stakeholder responses to Network Rail proposals

16.294 We have reviewed responses to the Network Rail consultation[321]. The key points are outlined directly below.

16.295 First Group and Transport Scotland questioned the appropriateness of retaining the current approach to cross border services where the Scottish franchised passenger operator pays no FTAC for usage of the network in England and Wales, and English cross-border services running into Scotland pay no FTAC for their usage of the Scottish network. They suggested that Network Rail should consider an approach which allocates FTAC to operators in line with actual usage of the track.

16.296 Transport Scotland outlined its intention that the Caledonian Sleeper service be let as a new franchise. For a number of reasons, it suggested that the franchise could be treated in a manner broadly comparable with an open access operator on both sides of the border i.e. the operator would pay VUCs but no FTAC.

16.297 Go-Ahead suggested that given the proposal to create indicative route-based RABS, it would also be a positive step to calculate matching route-based single tills to improve transparency.

16.298 PTEG outlined their view that the FTAC proposals do not go far enough in improving cost reflectivity or transparency. For example, it felt that a full avoidable cost approach should be adopted and that moving to a route based approach from SRS was a backward step. Transport for London (TfL) also took the latter view and felt that FTAC should be calculated at SRS and then aggregated to route level as required.

[321] For more information on the responses, see *Conclusions on fixed track access charges consultation*, Network Rail, March 2013, http://www.networkrail.co.uk/fixed-track-access-charges-consultation.pdf.

16.299 More generally, Northern Rail took the view that the proposed approach for CP5 was not significantly different from CP4.

Network Rail conclusions

16.300 Network Rail's conclusions[322] broadly reflected the proposals it consulted upon with two minor exceptions:

(a) small refinements to the allocation metrics for apportioning costs to operators; and

(b) remaining open to different options for how a new Caledonian Sleeper service might be charged.

Our assessment of Network Rail's conclusions

16.301 We welcome the progress that Network Rail made in CP4 in significantly improving the approach to FTAC allocation by disaggregating costs and income at SRS level. We further welcome the development of route based FTACs for CP5 which is necessary to bring the approach in line with Network Rail's newly devolved structure. We agree with the proposal to deduct station long term charges and facility charges from the specific operators' FTAC to which they relate, as it improves the incentive properties of the charge.

16.302 Some issues over cross border charging and cost allocation have been identified. Currently, Transport Scotland funds the operation, maintenance and renewal of the Scottish network through fixed charges paid by the Scottish franchisee and variable charges paid by all operators using the Scottish network. Each country's net revenue requirement (after variable track access charges and other single till income have been taken into account) is ultimately funded, therefore, by the fixed charges paid by the franchisee(s) in each country. This means that the Scottish franchisee does not pay FTACs for its usage of the English network and DfT specified operators do not pay FTACs for their usage of the Scottish network. There are also issues over enhancements which may take place in, for example, Scotland but provide more benefit for England and vice versa. In our view it is important that charges are cost reflective and transparent and that we do not unnecessarily increase administration

[322] *Fixed charges in CP5 – conclusions*, Network Rail, March 2013, http://www.networkrail.co.uk/fixed-track-access-charges-consultation.pdf.

costs and we will discuss these issues with Transport Scotland, DfT, Network Rail and other stakeholders

16.303 The current approach to cross border services paying FTAC partly reflects the wider arrangements agreed between the then Scottish Executive (now Scottish Government) and DfT in 2005-06 when devolution of functions took place under the Railways Act 2005. Therefore, while we consider that change to the current approach could deliver improvements to cost reflectivity and transparency, we think that any possible alteration would require agreement between Transport Scotland and DfT before any changes could be implemented.

16.304 We are content with Network Rail's proposal on calculating FTAC for any re-mapped franchised services based on vehicle km as this straightforward approach should reflect changes in network usage and ensure consistency between re-mappings over the control period. However, we note that a different approach may need to be taken to a separate Caledonian Sleeper service in partnership with Transport Scotland and that we will need to consider the approach to charging for this service in more detail as plans develop.

16.305 We are pleased that Network Rail has proposed that facility charges should remain in place until the end of the recovery period rather than rolled into FTAC at the beginning of new control periods. Consistent with the investment framework, facility charges should continue to be paid by a new franchisee when a current franchise ends to reflect the benefit to operators that run services on areas of the network that have been enhanced.

16.306 We understand that the Welsh Government, DfT and Network Rail have agreed that the Valleys line electrification enhancement will be funded from a facility charge from the beginning of CP5. DfT will pay the costs in CP5 during construction, with relevant operators paying the charge once the enhancement comes into operation. DfT will recover its CP5 costs from the Welsh Government from the start of CP6. The agreement will therefore have no impact on the level of FTAC in Wales during CP5.

16.307 We understand that some Crossrail services will start in CP5. For example, in March 2013, TfL announced the letting of a concession for the operation of existing rail services between London Liverpool Street and Shenfield from May 2015 which will result in the successful bidding operator taking over the stopping services currently operated by Greater Anglia. We would expect this transfer of services to Crossrail, and any others subsequent transfers, to be treated as a franchise re-mapping in order that FTAC is paid by Crossrail services upon their introduction.

16.308 We set out our approach to disaggregation in our May 2012 setting the financial and incentive framework for Network Rail in CP5 document. Greater disaggregation of price controls is in line with our desire to increase transparency of costs and revenues, support better whole-industry incentives and will in particular facilitate more local decision making (localism). Greater disaggregation, especially when combined with the increasing autonomy of routes under Network Rail's 'devolution' strategy, could also, in CP6, allow us to move towards a more comparative approach to regulation. Further disaggregation is also a key enabler for facilitating change in the rail industry, e.g. through devolution, alliances and potentially concessions.

16.309 Consistent with our approach, in our determination in annex G we have included indicative calculations of Network Rail's revenue requirement (including charges), debt and RAB by operating route. This will aid transparency and provide a basis for further development.

Network Rail's SBP forecast

16.310 Due to the absence of a decision on network grant at this stage of the periodic review, Network Rail has assumed in its SBP that the English and Welsh FTAC will be equal to its net revenue requirement for England and Wales. Similarly, the Scottish FTAC will be equal to Network Rail's net revenue requirement for Scotland.

16.311 Table 16.44 shows Network Rail's estimated income for FTAC over CP5.

Table 16.44: Network Rail's estimated fixed track access charge income for CP5

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Great Britain						
Fixed track access charge	4,774	4,991	5,209	5,468	5,649	26,091
England & Wales						
Fixed track access charge	4,266	4,452	4,637	4,866	5,029	23,250
Scotland						
Fixed track access charge	507	538	572	602	620	2,839

Note: numbers may not reconcile due to rounding.

Our assessment of Network Rail's SBP forecast

16.312 Tables 16.45-16.48 shows our determination of FTAC income for CP5 under a range of scenarios[323] given Network Rail's net revenue requirement:

(a) FTAC based on the adjusted WACC approach after network grant is taken into account[324];

(b) FTAC based on the cost of capital approach after network grant is taken into account;

(c) FTAC based on the adjusted WACC approach assuming zero network grant; and

(d) FTAC based on the cost of capital approach assuming zero network grant.

Table 16.45: Our determination of fixed track access charge income for CP5 based on the adjusted WACC approach after network grant is taken into account

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Great Britain						
Fixed track access charge	888	803	740	733	1,201	4,366
England & Wales						
Fixed track access charge	760	672	611	567	949	3,559
Scotland						
Fixed track access charge	129	131	129	167	252	807

Note:

1. Our assessment of FTAC reflects a level of network grant that is based on headroom of 5% for both government account rules (the market body test and investment test). This is explained in more detail in chapter 17.
2. Numbers may not reconcile due to rounding.

[323] Our determination does not include any possible changes to the cross-border approach to paying FTAC.

[324] Please refer to Chapter 17 for our decisions on network grant.

Table 16.46: Our determination of fixed track access charge income for CP5 based on the cost of capital approach after network grant is taken into account

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Great Britain						
Fixed track access charge	888	811	757	942	2,073	5,471
England & Wales						
Fixed track access charge	760	680	626	680	1,727	4,472
Scotland						
Fixed track access charge	129	132	131	262	347	1,000

Note:

1. Our assessment of FTAC reflects a level of network grant that is based on headroom of 5% for both government account rules (the market body test and investment test). This is explained in more detail in chapter 17.
2. Numbers may not reconcile due to rounding.

Table 16.47: Our determination of fixed track access charge income for CP5 based on the adjusted WACC approach assuming zero network grant

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Great Britain						
Fixed track access charge	4,840	4,788	4,774	4,771	4,780	23,952
England & Wales						
Fixed track access charge	4,307	4,241	4,218	4,220	4,234	21,220
Scotland						
Fixed track access charge	533	547	556	550	546	2,732

Note: numbers may not reconcile due to rounding.

Table 16.48: Our determination of fixed track access charge income for CP5 based on the cost of capital approach assuming zero network grant

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Great Britain						
Fixed track access charge	5,383	5,421	5,437	5,563	5,652	27,456
England & Wales						
Fixed track access charge	4,797	4,810	4,809	4,918	5,011	24,345
Scotland						
Fixed track access charge	586	611	628	645	641	3,111

Note: numbers may not reconcile due to rounding.

16.313 Once the network grant is established, Network Rail should continue to present the fixed track access charges on a gross basis (as if there were no network grant) as well as on an actual basis (with the network grant).

Station long term charge (LTC)

16.314 Network Rail is responsible for the maintenance, repair and renewal of most of the stations it owns. The Station Facility Owner (SFO) is responsible for the day to day management and operation of the station. Network Rail is the SFO for a small number of its larger stations, known as Managed Stations. For the majority of stations, the SFO is a franchised train operator.

16.315 Network Rail is to receive regulated income from stations in CP5 in the form of the station long term charge (LTC). This allows Network Rail to recover its efficient maintenance, renewal and repair costs associated with the franchised stations and managed stations that it owns.

16.316 Network Rail also receives income from managed stations qualifying expenditure (QX) and from franchised stations leases. However, with the exception of the management fee element of QX[325], these charges are not regulated by ORR. QX

[325] The SFO may levy the QX management fee on train operators using its stations. The management fee is set to recover the SFO's overheads in respect of operating, or procuring the operation of, the

covers the cost of the SFO's day-to-day running and operation of its stations. It also covers the reasonable costs incurred by the SFO for procuring or providing the services and amenities, which all users share. These charges are covered in more detail in annex C.

Franchised station LTC for CP4

16.317 The franchised station LTC has been set separately for each station but has been designed to reflect a reasonable expected long run efficient maintenance, repair and renewal (MRR) spend over the course of the control period at the level of the group of stations operated by each SFO, referred to as the portfolio of stations.

16.318 Individual station charges are not intended to be fully reflective of the specific spend at each station within the control period. They are instead designed to represent the proportion of the MRR expenditure for the portfolio of stations that would be spent on each station in the long run (over 35 years). It is therefore important to emphasise that it is unlikely that for an individual franchised station, the LTC revenue will be equal to MRR expenditure at that station. We are of the view it would not be helpful for train operators to link the two.

16.319 With the exception of managed stations, the SFO at the majority of stations is a franchised train operator. Other railway undertakings (Beneficiaries) using a station pay the SFO a proportion of the station LTC and a Qualifying Expenditure charge (covering a proportion of the costs incurred by the SFO in running the station). The proportion of the station LTC payable by a Beneficiary is usually based on its proportion of vehicle departures at that station, calculated in accordance with the methodology set out in the Station Access Conditions.

16.320 Until recently Network Rail was responsible for the MRR of all its stations. The current Greater Anglia franchise has full MRR responsibilities for its stations, and consequently does not pay the LTC to Network Rail. There is a possibility that a similar re-allocation of responsibility may take place for other new franchises, and in these instances charges may need adjusting to reflect reallocation of responsibility within the control period.

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station. In CP4, it amounted to around £2.5m income to Network Rail in total for the whole control period.

Managed station LTC for CP4

16.321 The managed station LTC has been calculated separately for each managed station. It has been calculated as the annual average of long run efficient MRR expenditure projected over a long time period (100 years). This was longer than for franchised stations in order to even out some of the extremes of spend found at these very large facilities. These extremes are more material for managed stations due to the scale of renewals costs at each station and the fact that there is no possibility to average across a larger portfolio.

Methodology for calculating the charge in CP5

16.322 In September 2012, Network Rail consulted with the industry on the structure of the station LTC at both franchised and managed stations in CP5. In January 2013, it concluded on this consultation.

16.323 Network Rail concluded that it would retain the LTC structure in broadly its current form in CP5. This included continuing to:

(a) base the franchised station LTC on total MRR expenditure at SFO portfolio level;

(b) calculate separate charges for each franchised station within each portfolio to reflect long term (35 year) average spend at individual station level;

(c) calculate the managed station LTC based on the annual average of long run efficient MRR expenditure projected over 100 years;

(d) levy the annual station LTC (for both franchised and managed stations) at a constant level for each year in CP5, albeit with uplifts for RPI; and

(e) exclude the cost of capital associated with stations from the LTC. This was to give a more meaningful cost reflective charge, i.e. reflective of expected expenditure across the relevant SFO's stations portfolio during CP5.

16.324 The main change to the methodology for CP5 was that Network Rail concluded that it would recover Stations Information and Security Systems (SISS) maintenance, renewal and repair costs from the LTC rather than FTAC.

16.325 Network Rail also proposed to include SISS maintenance and repair in the LTC in CP5 for Managed Stations. In CP4 the maintenance and repair costs in relation to SISS assets at Managed Stations have been captured through the stations QX

charge and FTAC respectively. It proposed this change in an e-mail to stakeholders in October 2012, shortly after the publication of its consultation letter.

16.326 In its consultation document, Network Rail proposed to charge at the portfolio level, rather than by station. This would involve each SFO receiving a single regular charge, reflecting the agreed settlement figure across its entire portfolio, rather than a charge for each station. In recognition that an SFO may need to recover some of the proposed portfolio LTC from beneficiaries at some or all of its stations, Network Rail proposed providing a percentage breakdown of portfolio costs by station. As a result of stakeholder responses to its consultation, in its January 2013 conclusions, Network Rail stated it would not adopt this proposal. Instead, as with CP4, it concluded to levy a charge for each individual station.

Our assessment of Network Rail's methodology for calculating the station LTC

16.327 We are content with Network Rail's conclusions regarding its methodology for the station LTC for CP5. In particular we agree with Network Rail's conclusion that:

(a) the structure of the station LTC should remain broadly the same in CP5 as in CP4. This is a view shared by the majority of stakeholders that responded to Network Rail's consultation;

(b) SISS expenditure should be included within the station LTC. This is more transparent and cost reflective than recovering SISS expenditure through the FTAC, since SISS expenditure can accurately be allocated to individual stations;

(c) SISS maintenance and repair at managed stations is treated as a landlord responsibility. This will result in the SISS expenditure categories captured in the managed station LTC being consistent with those captured in the franchised station LTC; and

(d) it continues to charge SFOs at station level, rather than at a portfolio level. The reason Network Rail gave initially for proposing to bill at portfolio level was to simplify charging arrangements. Responses from stakeholders suggested that it would instead result in an increase in the administrative burden on stakeholders.

Network Rail's SBP station LTC income forecast

16.328 The station LTC income forecasts Network Rail proposed in its SBP are based on its forecasts of stations MRR expenditure on buildings and SISS.

16.329 Tables 16.49 to 16.51 show Network Rail's SBP forecast for station LTC income for CP5. These figures are based on Network Rail applying a 16.1% efficiency overlay to the element of its pre-efficient station LTC income forecast relating to the recovery of buildings expenditure. This is inconsistent with the buildings expenditure efficiency overlay it submitted in its Tier 0 model, as part of the SBP, which was 16.6%. Network Rail has since confirmed that an efficiency overlay of 16.6% should have been applied, and on 23 April 2013, Network Rail published its draft station LTC price lists on this basis.

16.330 Network Rail applied an efficiency overlay of 15.0% to the element of its pre-efficient station LTC income forecast that is to recover SISS expenditure. This is consistent with the efficiency overlay in its Tier 0 model.

16.331 Network Rail's SBP forecast only includes SISS renewal costs. Network Rail has advised that it also intended to include SISS maintenance and repair costs. It has been unable to correct this error in time for inclusion in our draft determination. We will take it into consideration in our final determination. Network Rail has stated that it does not believe that this error will result in a material increase to LTC income[326].

Table 16.49: Network Rail's SBP estimated station LTC income for CP5 – Great Britain

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 Total
Managed stations						
LTC – buildings expenditure	25.6	25.6	25.6	25.6	25.6	128.2
LTC – SISS expenditure	4.9	4.9	4.9	4.9	4.9	24.5
LTC – total	30.5	30.5	30.5	30.5	30.5	152.7
Franchised stations						
LTC – buildings expenditure	126.3	126.3	126.3	126.3	126.3	631.7
LTC – SISS expenditure	17.8	17.8	17.8	17.8	17.8	89.1

[326] In the case of franchises stations it will be a redistribution from FTAC to LTC, and for managed stations a redistribution from QX to LTC.

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 Total
LTC – total	144.2	144.2	144.2	144.2	144.2	720.8

Note: numbers may not reconcile due to rounding.

Table 16.50: Network Rail's SBP estimated station LTC income for CP5 – England and Wales

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Managed stations						
LTC – buildings expenditure	23.9	23.9	23.9	23.9	23.9	119.5
LTC – SISS expenditure	4.4	4.4	4.4	4.4	4.4	21.8
LTC – total	28.3	28.3	28.3	28.3	28.3	141.3
Franchised stations						
LTC – buildings expenditure	114.0	114.0	114.0	114.0	114.0	570.1
LTC – SISS expenditure	16.9	16.9	16.9	16.9	16.9	84.6
LTC – total	130.9	130.9	130.9	130.9	130.9	654.7

Note: numbers may not reconcile due to rounding.

Table 16.51: Network Rail's SBP estimated station LTC income for CP5 – Scotland

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Managed stations						
LTC – buildings expenditure	1.8	1.8	1.8	1.8	1.8	8.8
LTC – SISS expenditure	0.5	0.5	0.5	0.5	0.5	2.7
LTC – total	2.3	2.3	2.3	2.3	2.3	11.5

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Franchised stations						
LTC – buildings expenditure	12.3	12.3	12.3	12.3	12.3	61.6
LTC – SISS expenditure	0.9	0.9	0.9	0.9	0.9	4.6
LTC – total	13.2	13.2	13.2	13.2	13.2	66.1

Note: numbers may not reconcile due to rounding.

Our assessment of Network Rail's SBP forecast

16.332 We have adjusted Network Rail's SBP submission on station LTC income to reflect our view of efficient CP5 stations MRR expenditure on buildings and SISS.

16.333 We did this by making an adjustment to reflect our assessment of pre-efficient expenditure on stations buildings and SISS, and applying our efficiency overlay for the final year of CP5. This is in order for the station LTC to reflect post-efficient expenditure on stations.

16.334 The efficiency overlays we applied are stated in Table 16.5. Our assessment of efficient buildings and SISS MRR expenditure is described in chapter 8 in our assessment of maintenance and renewals expenditure.

16.335 Tables 16.52 to 16.54 show our forecast station LTC income for CP5.

Table 16.52: Our determination of station LTC income stations for CP5 –Great Britain

£m (2012-13 prices)	CP4	CP5					CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Managed stations								
LTC – buildings expenditure	22	24.7	24.7	24.7	24.7	24.7	112	123.5
LTC – SISS expenditure	-	4.5	4.5	4.5	4.5	4.5	-	22.4
LTC – total	-	29.2	29.2	29.2	29.2	29.2	-	145.9
Franchised stations								
LTC – buildings expenditure	134	104.3	104.3	104.3	104.3	104.3	669	521.7
LTC – SISS expenditure	-	16.0	16.0	16.0	16.0	16.0	-	80.2
LTC – total	-	120.4	120.4	120.4	120.4	120.4	-	601.9

Notes:

1. In CP4 SISS expenditure was not recovered through the stations long term charge. It is therefore only possible to compare CP5 stations buildings expenditure with CP4. CP4 totals are as per our PR08 Determination
2. Stations long term charge income for Greater Anglia stations has been removed from the CP4 figures, so CP4 and CP5 can be compared on a like for like basis
3. Numbers may not reconcile due to rounding.

Table 16.53: Our determination of station LTC income stations for CP5 – England and Wales

£m (2012-13 prices)	CP4	CP5					CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Managed stations								
LTC – buildings expenditure	20	23.0	23.0	23.0	23.0	23.0	100	115.0
LTC – SISS expenditure	-	4.0	4.0	4.0	4.0	4.0	-	19.9
LTC – total	-	27.0	27.0	27.0	27.0	27.0	-	135.0

£m (2012-13 prices)	CP4	CP5					CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Franchised stations								
LTC – buildings expenditure	120	94.2	94.2	94.2	94.2	94.2	597	470.8
LTC – SISS expenditure	-	15.2	15.2	15.2	15.2	15.2	-	76.0
LTC – total	-	109.3	109.3	109.3	109.3	109.3	-	546.7

Notes:

1. In CP4 SISS expenditure was not recovered through the stations long term charge. It is therefore only possible to compare CP5 stations buildings expenditure with CP4. CP4 totals are as per our PR08 Determination
2. Stations long term charge income for Greater Anglia stations has been removed from the CP4 figures, so CP4 and CP5 can be compared on a like for like basis
3. Numbers may not reconcile due to rounding.

Table 16.54: Our determination of station LTC income stations for CP5 - Scotland

£m (2012-13 prices)	CP4	CP5					CP4	CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Total
Managed stations								
LTC – buildings expenditure	2	1.7	1.7	1.7	1.7	1.7	13	8.4
LTC – SISS expenditure	-	0.5	0.5	0.5	0.5	0.5	-	2.5
LTC – total	-	2.2	2.2	2.2	2.2	2.2	-	10.9
Franchised stations								
LTC – buildings expenditure	15	10.2	10.2	10.2	10.2	10.2	73	50.9
LTC – SISS expenditure	-	0.8	0.8	0.8	0.8	0.8	-	4.2
LTC – total	-	11.0	11.0	11.0	11.0	11.0	-	55.2

Note: In CP4 SISS expenditure was not recovered through the stations long term charge. It is therefore only possible to compare CP5 stations buildings expenditure with CP4. CP4 totals are as per our PR08 Determination

Next steps

16.336 As a result of Network Rail excluding SISS maintenance and repair expenditure in the managed and franchised station LTC, these elements of stations expenditure are included in QX and FTAC respectively in our draft determination. Network Rail has advised us that it intends, following our draft determination, to re-allocate the recovery of SISS maintenance and repair expenditure into its updated station LTC price lists. We support this approach, and will adjust our final determination accordingly.

16.337 In CP4 we approved the QX management fee for managed stations on an annual basis. For CP5 we will instead determine any such fee as part of PR13. This is to increase certainty and reduce the administration costs associated with approving it separately.

Our consultation on charges and on-rail competition

16.338 We will shortly be publishing a consultation paper on on-rail competition. On-rail competition is direct competition between rival train operating companies competing against each other to attract passengers. Our consultation outlines options for change in allowing access to open access operators, who must presently pass a test that their access will not be primarily abstractive (NPA) in that the ratio of their newly generated business to that abstracted from other operators will be at least 0.3:1. The options we propose in our consultation paper involve increasing the opportunities available to open access operators, but at the cost of their bearing additional charges in the form of a mark-up over and above the variable access charges they currently pay to Network Rail.

16.339 We present two options for reform (Options 2 and 3) which are compared with Option 1, the status quo. Options 2 and 3 differ in the method of calculation of the mark-up as follows:

(a) under Option 2 an open access operator will, in return for a partial relaxation of the NPA test, pay a mark-up as a contribution to Network Rail's fixed costs that is calculated on the basis of the level of abstraction its services will bring over and above the permitted level; and

(b) under Option 3 an open access operator will, in return for a partial relaxation of the NPA test, pay a mark-up calculated in a similar manner to the way that charges are currently calculated for franchised passenger services and/or similar

to the ways in which we envisage these charges evolving in the future on all of its services. Two potential variants of Option 3 are discussed. They involve aligning the charging structure for open access operators failing the NPA test with, in the case of 3A, the charging regime that franchised passenger operators currently face and, in the case of 3B, an estimate of the avoidable costs caused by open access.

16.340 Following consultation we will consider which is the most appropriate option to pursue and will present our conclusions on our approach to on-rail competition in our final determination in October 2013.

Issues specific to charter services

16.341 Charter services generally consist of excursion trains or privately hired trips which do not carry passengers at ordinary fares and which operate on a bespoke basis. The structure of charges for these operators is consistent with that for other operators, but takes account of the scale of charter operations so that the administrative burden associated with billing track access charges is not disproportionate. This is set out in the mode charter passenger track access contract.

16.342 In 2013, five train operators holding charter passenger track access contracts operate charter services: DB Schenker, West Coast Railway Company, Direct Rail Services, GB Railfreight and First Great Western.

16.343 Charter services run approximately 410,000 train miles per year on Network Rail infrastructure. That represents less than 0.2% of total passenger (franchised and open access) mileage. Network Rail's income from these operators in 2012-13 was approximately £1m.

16.344 The regulated track access charges for charter operators in CP4 consist of the following:

(a) variable usage charge (VUC);

(b) traction electricity charge (EC4T);

(c) electrification asset usage charge (EAUC);

(d) slot charges; and

(e) cancellation charges.

16.345 These are set out in more details below.

16.346 A VUC to recover Network Rail's operating, maintenance and renewal costs which vary with traffic. Unlike other passenger and freight operators, who are charged on a "per vehicle" basis, in CP4 charter operators have been charged on a "per train" basis in order to reduce the administrative complexity of the charge.

16.347 There are two VUC rates that apply to charter operators, based on notional "average" non-steam hauled and steam hauled charter trains. These are shown in Table 16.55 These are consistent with other VUCs, but reflect a typical charter train. The simplification is intended to reduce administrative burden. Therefore, for charging purposes, charter trains are assumed to be made up of:

(a) non-steam hauled: a locomotive (assumed to be the average of the rates for a Class 47 and a Class 67 locomotive with a 2:1 weighting in favour of the Class 67 to reflect frequency of use) plus 11 coaches (assumed to be the average of the rates for Mark 1, 2 and 3 coaches); and

(b) steam hauled: a locomotive (assumed to be 50% more expensive that the above non-steam hauled locomotive rate) plus 11 coaches (assumed to be the average of the rates for Mark 1, 2 and 3 coaches).

Table 16.55: 2012-13 charter train VUC rates

Service type	VUC (£/train mile)
Diesel or electric equipment	1.21
Steam equipment	1.45

16.348 Furthermore, the charter model track access contract states that the VUC should not be levied on charter "light locomotive movements".

16.349 A traction electricity charge (EC4T) to recover the costs of electricity supplied by Network Rail to train operators. In practice, only around 1% of total charter traffic mileage is run with electric trains.

16.350 The charter model contract includes provisions for modelled EC4T charging. However it does not include provisions for the volume wash-up applied in the case of other operators (passenger and freight). Historically however, Network Rail has deemed it administratively inefficient to put in place a robust process to charge charter operators

for their EC4T due to the very small amount of electric train miles operated by charter operators.

16.351 An EAUC designed to recover the variable maintenance and renewal costs associated with electrification assets. Similarly to EC4T charges, the charter model contract includes provisions to collect the EAUC, however Network Rail has historically deemed it to be administratively inefficient to levy the EAUC on charter operators.

16.352 Slot charges contribute towards Network Rail's costs for activities undertaken specifically for charter services, for which it is not otherwise funded.

16.353 Cancellation charges are designed to recover the proportion of the slot charge that has already been incurred before the decision has been taken to cancel the train.

16.354 Under the current arrangements, the capacity charge is not levied on charter operators. This is because at the time PR08 was conducted charter operators' access contracts were not based on a model contract, and did not contain a periodic review re-opener, so that there was no provision to levy a new charge as part of PR08. Following PR08, during CP4, ORR developed the charter model track access contract, but did not immediately levy a capacity charge, because such a change to the structure of charges should be implemented through a formal periodic review process rather than through the contract change mechanism. The model terms do however include a periodic review re-opener, so that a capacity charge can be levied as appropriate as part of PR13.

Network Rail's proposals for charges for CP5

16.355 On 28 May 2013, Network Rail issued[327] a consultation letter to the charter industry, setting out its proposals for changes to the charging arrangements outlined above. The consultation period is due to end on Tuesday, 11 July 2013. We encourage charter operators and any other interested parties to respond to the Network Rail consultation. In summary, the Network Rail consultation proposed the following changes for charter operators.

[327] Network Rail consultation letter of 28 May on structure of charges for charter operators in CP5, http://www.networkrail.co.uk/WorkArea/DownloadAsset.aspx?id=30064786015

16.356 Network Rail proposed retaining the existing approach for charging the VUC to charter operators, based on notional "average" charter train sets. It proposed to refresh the CP4 VUC charter rates. The technical considerations underpinning the refreshed rates can be found in Network Rail's letter referenced above. The proposed VUC rates for CP5 are shown in Table 16.56.

Table 16.56: CP5 charter train VUC rates as proposed in Network Rail's consultation letter (2012-13 prices)

Service type	VUC (£/train mile)
Diesel or electric equipment	1.20
Steam equipment	1.52

16.357 In addition, Network Rail proposed that light locomotive movements should no longer be exempt from being charged VUC. On a consistent basis with the rates highlighted above, Network Rail has calculated and published the rates for light locomotive movements shown in Table 16.57, to be charged per vehicle mile rather than per train mile.

Table 16.57: CP5 light locomotive VUC rates as proposed in Network Rail's consultation letter (2012-13 prices)

Service type	VUC (£/vehicle mile)
Diesel or electric equipment	0.63
Steam equipment	0.95

16.358 In relation to EC4T charges, Network Rail intends to bring this in line with arrangements in place for other electric operators, and formally charge charter operators for their use of EC4T in CP5, on either a metered or unmetered basis.

16.359 EC4T charges in the charter model contract are based on a price indexed by IIEC (Index of Industrial Electricity Prices). Network Rail also intends to charge charter operators on the basis of actual unit electricity prices paid by Network Rail, consistent with those paid by passenger operators.

16.360 For EAUC, Network Rail also proposed updating the arrangements and formally billing charter operators.

16.361 No other changes to current arrangements were proposed by Network Rail. However, the letter did observe that there may be a case for charging the capacity charge on charter operators in the future, to reflect charter operators' impact on capacity utilisation, and consequently on the financial risk Network Rail faces in relation to additional Schedule 8 payments.

The capacity charge

16.362 As outlined above, in CP4 charter operators have not been subject to a capacity charge. While we understand that historically there have been good reasons for this, we believe that from the point of view of ensuring non-discrimination, it would be right to introduce a charge to reflect their impact on capacity utilisation and the financial risk they impose on Network Rail. Therefore, we plan to introduce a capacity charge for charter operators in CP5. We intend to engage with the industry further before making our final determination in this area and we will shortly be holding a workshop with charter operators to discuss Schedule 8 and the capacity charge.

16.363 As discussed above, we are also making changes to the Schedule 8 arrangements for charter operators, through the introduction of a benchmarked regime, consistent with that applied for other passenger and freight operators. With the introduction of benchmarks in the Schedule 8 charter regime, on the basis of CP4 delays, we expect charter operators to be no worse off than they are currently, even with the introduction of a capacity charge.

16.364 Therefore, we believe that through this package of measures we are bringing the charter industry more in line with the other operators, with minimum disruption to their businesses.

The traffic forecasts used to forecast charges income

16.365 Network Rail has forecast traffic volumes for each of its routes for each year of CP5 in order to estimate the income it will receive from all track access charges excluding FTAC (which is not levied per unit of traffic). Its traffic forecasts also drive some of its estimates of costs, notably maintenance and renewal costs, as well as other considerations including performance and capacity.

16.366 In this section we:

(a) set out how Network Rail has prepared its traffic forecasts,

(b) explain our understanding of the extent to which the forecasts drive the forecasts of Network Rail's costs and income for CP5, and hence

(c) the implications of the forecasts for our determination of Network Rail's income from charges in CP5 and its net revenue requirement.

16.367 Network Rail submitted its SBP traffic forecasts to us as part of its infrastructure cost model (ICM) submission. This model was used to forecast income from charges, the results of which Network Rail published[328].

16.368 Consistent with the basis on which different charges are levied, for freight services its forecasts were in train km, and gross tonne km for each permutation of vehicle category and commodity; and for passenger services its forecasts were in train miles for each service code, and vehicle km for each vehicle category[329]. Summary statistics for the forecasts are shown in Table 16.58.

Table 16.58: SBP traffic forecasts: growth in traffic 2013-14 to 2018-19

	Freight		Franchised Passenger		Open Access Passenger		All electrified traffic
Metric	Train km	Tonne km	Train km	Vehicle km	Train km	Vehicle km	Vehicle km
Great Britain							
	24%	25%	1%	3%	2%	3%	24%
England & Wales							
	24%	26%	1%	3%	2%	3%	23%
Scotland							
	17%	16%	1%	2%	0%	0%	40%

Source: Network Rail Infrastructure Cost Model

[328] See Network Rail's SBP supporting documents on financing and funding, which set out income forecasts for each of the charges. http://www.networkrail.co.uk/browseDirectory.aspx?root=&dir=%5cStrategicBusinessPlan%5cCP5%5cSupporting%20documents%5cFinancing%20and%20funding

[329] For legacy reasons, charges are billed on the basis of miles, whereas Network Rail conducts much of its analysis using km.

16.369 Network Rail's SBP forecasts were derived from 2011-12 actual traffic. Network Rail forecast changes in passenger traffic for CP5 by taking account of planned and other expected changes to services, for example resulting from infrastructure enhancements. However, some parts of the network, for some times of the day, have sufficient spare capacity that they may experience increases in traffic without associated infrastructure enhancements or other investment. Network Rail has sought to forecast this underlying growth in vehicle km using guidance from the industry-standard Passenger Demand Forecasting Handbook. We consider that its approach has been sensible and balanced.

16.370 It has forecast changes in freight traffic for CP5 by taking account of the freight forecasts prepared for Network Rail's March 2007 Freight Route Utilisation Strategy[330]. Subsequent to the publication of the SBP, Network Rail has published new draft forecasts in its freight market study as part of its long term planning process[331]. We are aware that slightly different traffic forecasts are used elsewhere in the SBP and we have asked Network Rail to correct for this when it calculates its draft price lists and hence income forecasts.

16.371 Traffic forecasts drive not only charges income, but costs also. Forecasts inevitably become out of date, and this has occurred with respect to the SBP freight forecasts. We do not consider that using the SBP freight forecasts rather than these later freight forecasts materially affects our decisions or determination of Network Rail's funding, however. In particular:

(a) the general charging principle is that charges are set to equal costs directly incurred. Where charges are set on this basis, any divergence in traffic from that forecast will mean variations in cost that are exactly off-set by variations in charging revenue. The net effect on Network Rail's financial position is zero; and

(b) in some cases charges do not equal costs directly incurred. This will occur in the cases when changes are being delayed or phased in, or a particular charge is a

[330] http://www.networkrail.co.uk/browseDirectory.aspx?dir=%5CRUS%20Documents%5CRoute%20Utilisation%20Strategies%5CFreight

[331] Network Rail published the freight market study on 25 April 2013, http://www.networkrail.co.uk/improvements/planning-policies-and-plans/long-term-planning-process/market-studies/

mark-up on costs directly incurred. Our assessment is, however, that the effect of this is small in the context of the impact of uncertainty in the freight forecasts on calculating Network Rail's net revenue requirement. We have a high degree of confidence with respect to the forecasts of passenger traffic, though inevitably actual traffic may diverge from that forecast. We assess any error associated with forecast freight charging income offset by associated variable costs not to be material to our determination of Network Rail's net revenue requirement.

Implementation

16.372 Our conclusions will be implemented through changes to Schedule 7 of the track access contract and changes to station access agreements.

Implementation through the track access contracts

16.373 On 12 July 2013 we will consult on the contractual changes necessary to implement this draft determination. Network Rail will publish price lists consistent with our determination. As part of the changes we make to track access contract for PR13, we will change the price list to which the contracts refer from the CP4 price lists (published on 18 December 2008) to those for CP5, with reference to the date of publication. By referring to the date of publication, any price list published subsequently will not be valid within CP5 without the operator's consent (and we do not anticipate any such a price list being published).

Implementation through the station access contracts

16.374 Network Rail will publish price lists consistent with our determination. As part of the changes we make to stations access agreements for PR13, we will direct changes to update the stations long term charge for each station.

Adjusting access charges for inflation

16.375 Consistent with our approach to risk and uncertainty, as presented in Chapter 12, Network Rail's track access charges and station long term charges will continue to be adjusted each year for general inflation as measured by the retail price index.

16.376 The inflation adjustment to the price list is specified in the track access contract and Station Access Conditions. We will set out the proposed indexation methodology on 12 July 2013, when we consult on the changes to access contracts and station access agreements we consider necessary to implement our PR13 determination.

New or amended track access charges during CP5

16.377 Inevitably, following the issue of the final price lists for CP5, there will be situations during the control period when new or amended charges need to be set, for example, following the introduction of new rolling stock, or to apply discounts for regenerative braking. The existing model passenger and freight track access contracts currently provide for this, by allowing supplements to be made to the price lists[332].

16.378 We have recently reviewed the price list supplements provisions in Schedule 7 of the passenger and freight model track access contracts with the aim of improving the process and making them clearer and more consistent. We will seek Network Rail's and train operators' views on this on 12 July 2013 when we consult on the changes to access contracts and station access agreements we consider necessary to implement our PR13 determination.

Our conclusions on charges for different stakeholders

16.379 In this section we summarise our conclusions on charges, presenting them in terms of charges and estimated revenue for constant levels of traffic.

Franchise passenger services and passengers

16.380 Table 16.59 shows our determination of track access charges for franchise passenger services. The value of FTAC is contingent on the size of network grants and is not shown in the table.

Table 16.59: Our determination of variable charges for CP5 for franchise passenger services

Type of charge	Payable in CP5 by	CP4 charge (pence per vehicle mile)	CP5 charge(pence per vehicle mile)
VUC (estimated weighted average)	All services	9.36	9.32
Capacity charge (estimated weighted average)	All services	10.2	10.2

[332] These supplements apply only in respect of individual contracts; it is not possible to make global changes to the price lists so that they apply to all train operators. We consider that price lists can only be changed through an access charges review.

Type of charge	Payable in CP5 by	CP4 charge (pence per vehicle mile)	CP5 charge(pence per vehicle mile)
EAUC – DC (third rail)	Electrically powered services	0.47	0.72
EAUC – AC (overhead line)	Electrically powered services	1.24	1.62

Notes: the capacity charge is levied per train mile not vehicle mile, but is shown per vehicle mile to aid comparison

16.381 Table 16.60 shows revenue for each charge. To facilitate comparison, we have held prices, electricity prices and traffic levels constant for all years (and hence EC4T income is shown to be the same in each year).

16.382 On average, PR13 has very little impact on passenger charges. This will vary however between different types of vehicle. Charges in CP3 were a broadly similar level to CP4 and CP5, but with substantially higher VUC and lower capacity charge, as documented in our PR08 final determination.

Table 16.60: Network Rail income from franchise passenger services by charge (Great Britain, £m a year, 2013-14 traffic)

Charge	CP3	CP4	CP5	Change CP4 to CP5
VUC	319	159	159	-1%
Capacity charge	8	174	174	0%
EAUC	38	9	12	38%
EC4T (consistent electricity prices)	229	229	229	0%
Total, variable charges	**594**	**572**	**575**	**1%**

Notes:

1. The table shows charges determined as part of PR13. These do not include payments associated with Schedules 4 and 8, which are set out in chapter 20, and payments not determined as part of PR13.
2. EC4T revenue assumes constant electricity prices as well as traffic.
3. Numbers may not reconcile due to rounding.
4. CP3 revenue estimated on the basis of Table 19.14 in PR08 final determination.

16.383 Franchise services also receive Schedule 4 and pay Network Rail an access charge supplement to finance Schedule 4. They also receive and pay Network Rail Schedule 8 payments. These payments are set out in chapter 20.

Freight services and their customers

16.384 Table 16.61 shows our determination of track access charges for freight services. For those charges for which an increase is phased in, only the charges for the first and last year of CP5 are shown in this table: they are shown for each year of CP5 in full in the relevant section of this chapter.

Table 16.61: Our determination of charges for CP5 for freight services

Type of charge	Payable in CP5 by	CP4 charge (£ per kgtm)	CP5 charge (£ per kgtm)
VUC (estimated weighted average)	All services	1.76	1.76 (2014-15) rising to 1.94 (2018-19)
Capacity charge (estimated weighted average)	All services	0.15	0.15
Coal spillage	Services transporting coal	0.32 (2009-10) 0.25 (2012-13)	0.39
EAUC – DC (third rail)	Electrically powered services	0.0628	0.0498
EAUC – AC (overhead line)	Electrically powered services	0.1178	0.2482
FOL charge	ESI coal	0.53	0.50
FOL charge	Iron ore	0.00	0.00 (2014-15) rising to 0.76 (2018-19)
FOL charge	Spent nuclear fuel	5.34	5.34 (2014-15) rising to 27.50 (2018-19)
FSC	ESI coal	0.00	0.00 (2014-15) rising to 1.04 (2018-19)
FSC	Iron ore	0.00	0.00 (2014-15) rising to 0.76 (2018-19)
FSC	Spent nuclear fuel	0.00	0.00 (2014-15) rising to 3.00 (2018-19)

Notes:

1. The capacity charge is levied per train mile not per kgtm, but is shown per kgtm to aid comparison
2. kgtm = thousand gross tonne miles.

16.385 Table 16.62 and 16.63 show charges revenue broken down by charge and by rail freight commodity respectively. To facilitate comparison, we have held prices, electricity prices and traffic levels constant for all years (and hence EC4T income is shown to be the same in each year). As increases in some charges are phased in over time, we show both revenue for the charge at the end of CP5 (2018-19) and as an average for CP5. Commodities with relatively low shares of traffic that are not subject to a FSC are aggregated in the category "other".

16.386 Overall, in real terms, charges are set to increase by around 21% on current levels by 2018-19, equivalent to 4% a year average. For commodities not affected by the FSC, the corresponding increases are 4% and 1% respectively. There will be large variation in the extent of increase in charges for individual commodities, with track access charges falling marginally for some commodities, and increasing materially for others.

Table 16.62: Network Rail income from freight services by charge (Great Britain, £m a year, 2013-14 traffic)

Charge	CP3	CP4	CP5 average	End CP5 (2018-19)	Change CP4 to 2018-19	Average annual increase
VUC	103.1	59.8	61.9	65.8	10%	2%
Capacity charge	4.8	4.8	4.8	4.8	5%	1%
Coal spillage charge	4.2	2.0	3.0	3.0	48%	8%
EAUC		0.3	0.6	0.6	110%	16%
Freight-only line charge		3.9	3.9	4.4	14%	3%
Freight specific charge		0.0	2.8	7.9		
EC4T (consistent electricity prices)	6.2	6.2	6.2	6.2	0%	0%

Charge	CP3	CP4	CP5 average	End CP5 (2018-19)	Change CP4 to 2018-19	Average annual increase
Total variable charges	118.1	77.0	83.2	92.7	21%	4%

Notes:

1. Coal spillage charge revenue for CP4 is 2012-13, with charge below that set in PR08. EC4T revenue assumes constant electricity prices as well as traffic.
2. The table shows charges determined as part of PR13. These do not include payments associated with Schedules 4 and 8, which are set out in chapter 20, and payments not determined as part of PR13.
3. Numbers may not reconcile due to rounding.
4. CP3 revenue estimated on the basis of Table 19.15 in PR08 final determination.

Table 16.63: Network Rail income from freight services by key commodity (Great Britain, £m a year, 2013-14 traffic)

£m (2012-13 prices)	CP4	2014-15	2015-16	2016-17	2017-18	2018-19	% annual increase CP4 to end CP5
Domestic intermodal	24.6	24.9	24.9	24.6	24.1	23.2	-1%
Construction materials	9.5	9.5	9.5	10.0	10.6	11.8	4%
Steel	6.3	6.3	6.3	6.4	6.6	7.0	2%
Petroleum	3.3	3.3	3.3	3.3	3.1	2.9	-3%
Biomass	2.4	2.4	2.4	2.5	2.5	2.6	1%
Coal other	1.3	1.4	1.4	1.5	1.6	1.8	6%
European intermodal	1.4	1.4	1.4	1.4	1.3	1.2	-2%
Industrial minerals	0.9	0.9	0.9	1.0	1.0	1.1	3%
Domestic automotive	0.8	0.8	0.8	0.8	0.8	0.7	-3%
Other	3.4	3.4	3.4	3.5	3.7	4.0	3%
Total, commodities to which FSC does not apply	**55.0**	**55.3**	**55.3**	**55.7**	**56.3**	**57.3**	**1%**
ESI coal	21.3	22.1	22.1	24.5	28.7	33.8	10%
Iron ore	0.4	0.4	0.4	0.5	0.6	0.7	12%

£m (2012-13 prices)	CP4	2014-15	2015-16	2016-17	2017-18	2018-19	% annual increase CP4 to end CP5
Nuclear	0.3	0.3	0.3	0.4	0.7	0.9	29%
Total, commodities subject to FSC	**22.0**	**22.8**	**22.8**	**25.3**	**29.9**	**35.5**	**10%**
Total	**77.0**	**78.1**	**78.1**	**81.0**	**86.2**	**92.7**	**4%**

Notes:

1. The table shows charges determined as part of PR13. These do not include payments associated with Schedules 4 and 8, which are set out in chapter 20, and payments not determined as part of PR13.
2. Numbers may not reconcile due to rounding.

Open access passenger services and passengers

16.387 Table 16.64 shows our determination of charges for open access passenger services.

16.388 The tables in this section show the capacity charge without correction for anomalies. There are some anomalies in the levying of the capacity charge that we plan to address in time for CP5.

Table 16.64: Our determination of variable charges for CP5 for open access passenger services

Type of charge	Payable in CP5 by	CP4 charge (pence per vehicle mile)	CP5 charge(pence per vehicle mile)
VUC (estimated weighted average)	All services	13.28	13
Capacity charge (estimated weighted average)	All services	6	6
EAUC – DC (third rail)	Electrically powered services	0.47	0.72
EAUC – AC (overhead line)	Electrically powered services	1.24	1.62

Notes:

1. The capacity charge is levied per train mile not vehicle mile, but is shown per vehicle mile to aid comparison
2. Due to data constraints, we estimate the open access weighted charges to one or two significant figures only.

16.389 The impact of our determination on track access charges for open access passenger services is shown in Table 16.65. As with the equivalent previous tables, we have assumed constant traffic and electricity so that the impact of PR13 is shown in full.

Table 16.65: Open access passenger revenue by charge (Great Britain, £m a year, 2013-14 traffic)

Charge	CP4	CP5	Change CP4 to CP5
VUC	2.5	2.5	-1%
Capacity charge	1.1	1.1	0%
EAUC	0.0	0.0	100%
EC4T (consistent electricity prices)	3.7	3.7	0%
Total	7.3	7.3	1%

Notes:

1. The table shows charges determined as part of PR13. These do not include payments associated with Schedules 4 and 8, which are set out in chapter 20, and payments not determined as part of PR13.
2. EC4T revenue assumes constant electricity prices as well as traffic.
3. Numbers may not reconcile due to rounding.

Next steps

16.390 Following our draft determination, Network Rail will publish revised draft price lists for passenger and freight services, excluding charter services, consistent with our determination. It will do this on or before 12 July 2013. In addition, on 12 July 2013 we will consult on the contractual changes necessary to implement this draft determination.

16.391 Network Rail will also conclude on its consultation on charges for charter operators, and we are shortly to engage with charter operators to decide on a process for making complementary reforms to Schedule 8 and the capacity charge in charter track access contracts.

16.392 In this chapter, we are consulting on an alternative to the capacity charge. We will conclude on this as part of our final determination, including how any such change would be implemented.

16.393 Following our final determination, Network Rail will publish its final price lists on or before 20 December 2013. This will apply from the start of CP5.

17. Network grant

Key messages in this chapter

- Network grants are paid directly by DfT and Transport Scotland to Network Rail 'in lieu of' some fixed track access charges.
- Our preferred method of funding Network Rail is for all of its income to come from train operators and other customers and not through network grant, but we recognise the governments' reporting and affordability issues. So we have decided to allow part of Network Rail's income to be provided directly by the governments through network grants, which will be set ex-ante for each year of CP5, as we did in CP4.
- We have presented a number of options showing different levels of network grant based on different ways of applying public sector accounting and the governments' reporting rules.

Introduction

17.1 This section sets out the options on the level of network grant payments that we will allow Network Rail to receive from DfT and Transport Scotland in CP5 'in lieu of' some fixed track access charges.

Background and approach

17.2 A proportion of Network Rail's revenue requirements have in the past been paid directly by DfT and Transport Scotland to Network Rail in the form of network grants, 'in lieu of' some fixed track access charges, on a pound-for-pound basis[333].

17.3 Our preferred method of funding Network Rail is for all of its income to come from train operators and other customers and not through network grants, but we recognise public sector accounting and reporting rules and both governments' affordability position. So we decided in December 2012 to allow part of Network Rail's income to be provided directly by the governments through network grants, which will be set ex-ante for each year of CP5, as we did in CP4. The policy issues relevant to this

[333] The level of the network grants in CP4 is similar to our PR08 forecast of Network Rail's capital expenditure.

decision are discussed in the financial framework chapter (chapter 12) and in our December 2012 financial issues decision document.

17.4 In PR08, we set the level of network grants with reference to the governments reporting rules, which say that direct grants paid to Network Rail are accounted for as capital expenditure in the governments' accounts, whereas the equivalent money paid to train operating companies (who in turn pay track access charges to Network Rail) are accounted for as resource (current) expenditure. In previous control periods, the level of network grants have been set by way of two financial tests, which relate to the governments' budgeting and statistical practice:

(a) **investment test**: this states that network grants that are accounted for as capital expenditure in the governments' accounts, cannot exceed Network Rail's capital investment (i.e. renewals and enhancements). Any network grants paid in excess of capital investment are accounted for as resource expenditure. This test applies in respect of the governments in England & Wales and Scotland separately; and

(b) **market body test**: this test requires that to be classified as a market body, Network Rail's annual income from sales (equal to access charges plus other single till income) covers at least half of the company's production costs (equal to operating and maintenance expenditure and statutory depreciation). This test applies to Network Rail as a whole and separate calculations do not need to be made for England & Wales and Scotland. We are currently considering how forthcoming changes to the governments budgeting and statistical reporting, may affect the calculation and use of the market body test[334].

17.5 In our December 2012 financial issues decisions document, we said that given the importance of driving more commercial relationships in the industry, we are keen to see the level of network grants decline in CP5. Therefore, we have not strictly applied the governments' reporting rules but have used them as a reference point. In particular, we have looked at different approaches to how we can factor headroom into the calculation. The adjustment for headroom recognises that Network Rail's

[334] The European System of Accounts 2010 (ESA10) will replace the European System of Accounts 1995 (ESA95) for reporting of the UK National Accounts from 2014 and ESA10 includes a different definition of production costs to ESA95.

outturn income and costs in CP5 could be different to our forecast and, everything else being equal, the headroom reduces the maximum level of the network grants in our calculations.

17.6 In PR08, we only applied headroom to the market body test to increase the threshold required for the test from 50% to 55% (i.e. we applied headroom of 5%). For PR13, we think it is more appropriate to apply headroom to both the investment test and the market body test. Therefore, we have shown below the levels of grant that we could allow for England & Wales and Scotland in CP5 based on headroom assumptions of 5%, 15% and 25%. These assumptions are derived from our work on modelling the limits on financial indebtedness and our analysis of the potential variance in Network Rail's expenditure in CP5.

17.7 To provide further transparency, we have set out clearly in annex F what the level of fixed track access charges would be in the absence of direct network grant payments by operating route. In this way, it is clearer where the network grant goes, and – through our work in setting and monitoring outputs and key performance indicators (KPIs) – what taxpayers are getting for their money.

Schedule of network grant payments for CP5

17.8 Tables 17.1 and 17.2 set out our assessment of the options for the level of network grant payments in CP5, calculated on the basis set out above.

Table 17.1: Our assessment of the options for CP5 network grant payments in England & Wales

(£m 2012-13 prices)	England & Wales					
PR08	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**CP4 total**
Network grant	3,724	3,746	3,774	3,703	3,398	18,344
PR13	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**CP5 total**
Scenario 1: 5%	3,547	3,569	3,607	3,654	3,284	17,661
Scenario 2: 15%	3,183	3,194	3,228	3,270	2,939	15,813
Scenario 3: 25%	2,819	2,819	2,849	2,886	2,593	13,966

Table 17.2: Our assessment of the options for CP5 network grant payments in Scotland

(£m 2012-13 prices)	Scotland					
PR08	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**CP4 total**
Network grant	403	396	447	313	282	1,842
PR13	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**CP5 total**
Scenario 1: 5%	405	416	427	383	294	1,925
Scenario 2: 15%	366	375	385	343	263	1,731
Scenario 3: 25%	327	333	343	303	232	1,538

17.9 The potential network grants in CP5 are 49.0% - 61.9% of Network Rail's gross revenue requirement in England & Wales and 47.5% - 59.6% in Scotland. This is £683m to £4,378m lower than the PR08 level in England & Wales and £83m higher to £304m lower than the PR08 level in Scotland.

17.10 Although the network grant payments represent a significant revenue stream for Network Rail, the company will still receive a large amount of money direct from train operators as shown in the access charges chapter (chapter 16).

17.11 We will discuss the options for the level of the network grant payments in CP5 further with Network Rail and the governments and will decide on them in our final determination.

18. Other single till income

Key messages in this chapter

- The elements of other single till income (OSTI) covered in this chapter mainly relate to Network Rail's property business and income from some enhancements undertaken by Network Rail, such as Crossrail. The other elements of OSTI, e.g. freight charges and stations income are included in the access charges chapter (chapter 16). Annex C provides a reconciliation of the elements of OSTI included in this chapter and the elements of OSTI included in the access charges chapter (chapter 16), to our assumption of OSTI in the calculation of the net revenue requirement in Network Rail's revenue requirement chapter (chapter 14).
- A review of Network Rail's property income forecasts in its SBP shows that Network Rail may be able to generate a higher level of income in CP5 compared to the assumptions in its SBP. For example, we think that in its SBP Network Rail does not take sufficient account of the potential growth in its income from its property portfolio as a result of forecast passenger growth. Also, Network Rail's SBP forecast of income from property sales and other opportunities was conservative.
- The cost of capital used for the return on investment framework projects has been reduced from 6% in CP4 to 4.91% in CP5. This is consistent with our determination of Network Rail's cost of capital as discussed in the financial framework chapter (chapter 12).
- We have included additional income (and the corresponding capital expenditure) in our determination resulting from investments that Network Rail could make in CP5 in its property portfolio as well as on stations. Network Rail's forecast in its SBP was only based on schemes that had been identified at the time it prepared its SBP.

Introduction

18.1 This chapter sets out our assessment of Network Rail's likely income from sources other than access charges in CP5. Other single till income (OSTI) is subtracted from the gross revenue requirement, pound for pound to calculate the net revenue requirement.

18.2 The elements of OSTI that we assess in this chapter consist of income derived from:

(a) Network Rail's property portfolio (e.g. income from station retail outlets, property sales etc). Therefore this stream of income is affected by external markets; and

(b) income from some enhancements undertaken by Network Rail such as Crossrail

18.3 This chapter excludes the elements of OSTI related to charges from freight and open access operators, station long term charges, station qualifying expenditure, station lease income and depots income, which are assessed in the access charges chapter (chapter 16).

18.4 Annex C provides a reconciliation of the elements of OSTI included in this chapter and the elements of OSTI included in the access charges chapter (chapter 16), to our assumption of total OSTI in the calculation of the net revenue requirement in the Network Rail's revenue requirement chapter (chapter 14). The other elements of OSTI, e.g. non-regulated charges are included in annex C.

Network Rail's SBP

18.5 Network Rail's SBP focused on the three main areas of OSTI covered in this chapter: property income and property sales; finance charges for the Crossrail and Welsh Valley projects and facility charges on investment framework schemes.

18.6 Tables 18.1, 18.2 and 18.3 summarise Network Rail's SBP forecast of OSTI in CP5. All numbers have been rounded to the nearest £100k.

Table 18.1: Network Rail's SBP forecast of other single till income in CP5 (Great Britain)

£m (2012-13 prices)	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	CP4 Total	CP5 Total
Property rental	292.0	261.0	267.3	271.4	275.8	280.9	1,293.0	1,356.4
Property sales		19.7	20.5	20.5	21.0	19.9		101.6
Adjustment for commercial opex	-31.7	-30.6	-30.8	-30.8	-30.8	-30.8	-180.2	-153.8
Crossrail finance charge	-	32.0	52.0	70.0	83.0	89.0	-	326.0
Welsh Valleys finance charge	-	0.6	1.6	3.7	8.4	13.5	-	27.8
Facility charges – station depot and track	44.0	50.6	53.9	53.6	53.3	53.0	147.0	264.4
Other	13.0	13.7	9.8	9.8	9.8	9.8	78.0	52.9
Total non-charge related income	**317.3**	**347.0**	**374.3**	**398.2**	**420.5**	**435.3**	**1,337.8**	**1975.3**

Table 18.2: Network Rail's SBP forecast of other single till income in CP5 (England & Wales)

£m (2012-13 prices)	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	CP4 Total	CP5 Total
Property rental	274.5	245.3	251.3	255.1	259.3	264.0	1,214.0	1,275.0
Property sales		18.5	19.3	19.3	19.7	18.7		95.5
Adjustment for commercial opex	-28.9	-28.8	-29.0	-29.0	-29.0	-29.0	-169.4	-144.8
Crossrail finance charge	-	32.0	52.0	70.0	83.0	89.0	-	326.0
Welsh Valleys finance charge	-	0.6	1.6	3.7	8.4	13.5	-	27.8
Facility Charges – station depot and track	43.3	49.8	53.1	52.8	52.5	52.2	145.0	260.4
Other	12.7	13.3	9.5	9.5	9.5	9.5	77.0	51.3
Total non-charge related income	**300.7**	**330.7**	**357.8**	**381.4**	**403.4**	**417.9**	**1,266.6**	**1891.2**

Table 18.3: Network Rail's SBP forecast of other single till income in CP5 (Scotland)

£m (2012-13 prices)	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	CP4 Total	CP5 Total
Property rental	17.5	15.7	16.0	16.3	16.5	16.9	79.0	81.4
Property sales		1.2	1.2	1.2	1.3	1.2		6.1
Adjustment for commercial opex	-1.9	-1.8	-1.8	-1.8	-1.8	-1.8	-10.8	-9.0
Facility charges – station depot and track	0.7	0.8	0.8	0.8	0.8	0.8	2.0	4.0
Other	0.3	0.3	0.3	0.3	0.3	0.3	1.0	1.5
Total non-charge related income	**16.6**	**16.2**	**16.5**	**16.8**	**17.1**	**17.4**	**71.2**	**84.0**

Property income (property rental and property sales)

18.7 Network Rail stated in its SBP that its property division's role is to provide "high quality professional property services to support the railway, delight our customers and stakeholders and help to reduce industry costs". Network Rail pointed out that although the maximisation of revenue for the property division is important, it should not be seen in isolation from the rail network. For example, if a railway arch tenant causes a fire, the resulting compensation that is paid is likely to exceed the rental income received. Furthermore, Network Rail states that the requirement for access to the railway infrastructure limits its ability to securitise rental streams.

18.8 Network Rail's IIP forecast total property income in Great Britain of £1,707m is 14.5% higher than it forecast in its PR13 SBP. Network Rail said that this reflects the contraction in the property market since Network Rail's PR13 IIP and the subdued economic outlook. The effect is due to a combination of:

(a) a lower baseline at the start of CP5;

(b) a reduction in the number of developments to open up revenue streams at major stations; and

(c) a reduction in growth assumptions based on long term economic forecasts for CP5.

18.9 Network Rail's forecast property rental income for Great Britain in CP5 is £1,356m. Network Rail forecasts that income from managed station retail units (which is

included in property rentals income) will increase on average by 1.95% per annum. This is driven mainly by property market forecasts, which in Network Rail's view continue to be subdued during the control period.

18.10 Potential property sales in CP5 have been identified by Network Rail on a project by project basis. Then Network Rail applies a probability of success factor to each project, to derive the total income from property sales of £101m for Great Britain in CP5.

Crossrail finance charge and Welsh Valleys finance charge

18.11 Government sponsored non-HLOS funded schemes are funded by a finance charge, which is levied by Network Rail to compensate it for the capital invested in the project.

Crossrail finance charge

18.12 This charge relates to upgrade works (referred to as on-network works) on existing Network Rail track required in order to carry Crossrail trains across the non-tunnel sections of the Crossrail route.

18.13 Network Rail's SBP includes the capital expenditure on the project based on the estimated £1,444m of capital works in CP5. To ensure that the costs of the project are borne by the co-sponsors (DfT and Transport for London (TfL)), Network Rail will be remunerated by Crossrail Limited ("CRL") for an investment framework "financing charge" which is based upon the project's phased capital profile and Network Rail's WACC for investment framework schemes. This investment framework charge will also recover the capital cost of the project through the amortisation element of the finance charge. We are currently discussing with Network Rail, DfT and TfL how this financing charge will be calculated.

18.14 The income forecast in Network Rail's SBP is based on the forecast profile of the capital programme. We will therefore assess for the final determination, whether we need to update our assumptions for changes to the profile of the capital programme[335].

[335] The estimated income from this project of £326m in CP5 is only included in England & Wales and Great Britain.

Welsh Valleys finance charge

18.15 This finance charge in our determination for this project is calculated based on the same approach as for the Crossrail project and we are currently discussing with Network Rail, DfT and the Welsh Government how it will be calculated. The sponsor is the Welsh Government and the project relates to the electrification of the Valleys line along with the Great Western Main Line between Cardiff and Bridgend.

18.16 The capital cost associated with the Welsh Valleys project in CP5 is included in enhancement expenditure in Network Rail's SBP. This forecast is a Network Rail mid-point GRIP 2 estimate, which is based on the Welsh Government's Outline Business Case (OBC). However, as the scheme progresses the forecast is expected to be refined[336].

Facility charges – station, depots and track

18.17 Network Rail generates income from investment framework projects where it carries out capital works which are not planned as part of the periodic review process. This income is received through facility charges paid to Network Rail by the project sponsors. Income of £264m for Great Britain in relation to investment framework projects that had been identified by Network Rail at the time it prepared its SBP, was included in its SBP. In Great Britain, stations and depots income was forecast to be £208m and track income was forecast to be £56m. Network Rail used a 6% WACC assumption to calculate the charge, which is the rate of return allowed under the CP4 regulatory settlement for these schemes.

Other charges (HS1 and TOC insurance)

18.18 High Speed 1 ("HS1") income is derived from Network Rail's activities on the HS1 network under a management contract. Network Rail does not own the HS1 network but it carries out the asset management, operation (including timetabling), maintenance and renewal of the HS1 network. Network Rail has assumed in its SBP that net revenues from HS1 will fall from £10.4m to £6.5m per annum as a result of PR14 (HS1 periodic review). However, this is uncertain as HS1's access charges will be determined in 2014.

[336] The estimated income from this project of £28m in CP5 is only included in England & Wales and Great Britain.

18.19 Insurance is purchased by Network Rail on behalf of the TOCs and the cost of £3m per annum for Great Britain is re-charged to the TOCs.

Our view of the SBP

Summary

18.20 Table 18.4 summarises our assessment of projected OSTI covered in this chapter in CP5 for Great Britain.

Table 18.4: Our assessment of other single till income in CP5 (Great Britain)

£m (2012-13 prices)	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	CP4 Total	CP5 Total
Property rental	292.0	272.1	307.7	331.1	357.6	387.9	1,293.0	1,656.4
Property sales		34.7	35.5	35.5	36.0	34.9		176.6
Adjustment for commercial opex	-31.7	-30.6	-30.8	-30.8	-30.8	-30.8	-180.2	-153.8
Crossrail Finance Charge	-	29.2	47.2	64.2	75.9	81.6	-	298.1
Welsh Valleys Finance Charge	-	0.5	1.3	3.0	6.9	11.1	-	22.8
Facility Charges – Station depot and Track	44.0	47.2	52.8	55.5	58.1	60.8	147.0	274.4
Other	13.0	13.7	13.7	13.7	13.7	13.7	78.0	68.5
Total non-charge related income	**317.3**	**366.8**	**427.4**	**472.2**	**517.4**	**559.2**	**1,337.8**	**2343.0**

18.21 Table 18.5 summarises our assessment of projected OSTI in CP5 for England & Wales.

Table 18.5: Our assessment of other single till income in CP5 (England & Wales)

£m (2012-13 prices)	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	CP4 Total	CP5 Total
Property rental	274.5	255.8	289.2	311.2	336.1	364.6	1,215.4	1,557.0
Property sales		32.6	33.4	33.4	33.8	32.8		166.0
Adjustment for commercial opex	-29.8	-28.8	-29.0	-29.0	-29.0	-29.0	-169.4	-144.8
Crossrail Finance Charge	-	29.2	47.2	64.2	75.9	81.6	-	298.1
Welsh Valleys Finance Charge	-	0.5	1.3	3.0	6.9	11.1	-	22.8
Facility Charges – Station depot and Track	43	46.3	51.7	54.2	56.8	59.3	145.0	268.3
Other	12.7	13.4	13.4	13.4	13.4	13.4	77.0	67.0
Total non-charge related income	**300.7**	**349.0**	**407.2**	**450.4**	**493.9**	**533.8**	**1,266.6**	**2234.4**

18.22 Table 18.6 summarises our assessment of projected OSTI in CP5 for Scotland.

Table 18.6: Our assessment of other single till income in CP5 (Scotland)

£m (2012-13 prices)	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	CP4 Total	Total
Property rental	17.5	16.3	18.5	19.9	21.5	23.3	79.0	99.4
Property sales		2.1	2.1	2.1	2.2	2.1		10.6
Adjustment for commercial opex	-1.9	-1.8	-1.9	-1.9	-1.9	-1.9	-10.8	-9.4
Facility Charges – Station depot and Track	0.7	0.9	1.1	1.2	1.4	1.5	2.0	6.1
Other	0.3	0.3	0.3	0.3	0.3	0.3	1.0	1.5
Total non-charge related income	**16.6**	**17.8**	**20.1**	**21.6**	**23.5**	**25.3**	**71.2**	**108.2**

Property rental and property sales income

18.23 Network Rail's SBP property forecasts for CP5 and the methodology underlying them were reviewed by DTZ on our behalf to obtain an independent view on the robustness of its assumptions and forecasts of property income.

18.24 DTZ said that Network Rail's SBP forecasts were based on broadly reasonable assumptions. However, overall it thinks that Network Rail's forecast of property

income in CP5 is too conservative. The main reasons for this were that DTZ consider that:

(a) as much of Network Rail's property is located within stations, which service the rail network, Network Rail's retail operations will benefit from the considerable growth in the number of railway passengers forecast over CP5 (projected at 4% per annum);

(b) Network Rail could improve its tenant mix and make greater use of rents based on the turnover of the lessee. In addition, further revenue uplift could be facilitated by a negotiated reduction in the number of protected leases (i.e. leases within the security of tenure provisions of the 1954 Landlord & Tenant Act.) which represent 28% of its managed stations units;

(c) Network Rail's forecasts for property sales in CP5 were relatively conservative and it considered there was scope to significantly increase the income from property sales. For example, through the use of joint venture agreements; and

(d) Network Rail had not factored into its SBP forecasts, income from projects that have a low probability of happening but can be material. Historical precedence at Network Rail indicates that, on a portfolio basis, some of these low probability and possibly material projects can happen. For example, the Victoria Place project, was not identified in PR08, but is now contributing to Network Rail's income. Also, Project Mountfield (a proposed acquisition by Network Rail of freight sites from DB Schenker), was actively considered by Network Rail but has not happened but could become a source of income in the future. Therefore, some income from low probability schemes was included in DTZ's property income assumptions.

18.25 Overall, DTZ's report presented its forecast of Network Rail's property income in CP5 as a range. This range was £1,539m to £1,833m for Great Britain and its base forecast was £1,645m for Great Britain. This compares to Network Rail's SBP assumption for Great Britain of £1,458m (£1,356m property rental and £102m property sales). Also, DTZ consider that the high end of its range does not represent the most extreme outcome that is possible.

18.26 We agree with DTZ that Network Rail's forecast of property income in CP5 in its SBP is too conservative, primarily due to the reasons outlined above and we think that

DTZ's range was based on reasonable adjustments to Network Rail's assumptions but some of those adjustments may have been too cautious.

18.27 Therefore, we have decided that in our determination we will use the "upper" end of DTZ's range of property income for Great Britain (£1,656m of property rental and £177m of property sales for Great Britain), this total income of £1,833m for Great Britain is 25.7% higher than Network Rail's SBP. We consider this assumption will be challenging but achievable and in reaching our decision we have taken account of Network Rail's response to DTZ's report.

18.28 Also, Network Rail's SBP forecast income in Tables 18.1, 18.2 and 18.3 above excludes income relating to projects which were not specifically identified by Network Rail at the time it prepared its SBP, but nevertheless based on previous experience, it can be reasonably predicted that some opportunities for future developments will materialise. Therefore, we have included an estimate of the future income from these schemes of £122m for Great Britain in our draft determination in Table 18.4 above (based on DTZ's "high" scenario, which was uplifted from its base forecast of £120m). In our enhancements determination in the enhancements chapter (chapter 9), we have included Network Rail's forecast of £231m of capital expenditure required to deliver these projects.

Crossrail finance charge and Welsh Valleys finance charge

18.29 We have amended the financing charges for the Crossrail and Welsh Valleys projects to reflect Network Rail's real "vanilla" WACC of 4.31% for CP5, as described in the impact of financial framework on financial parameters chapter (chapter 13), as Network Rail assumed a real "vanilla" WACC of 4.75%. For the Welsh Valleys finance charge, we have also reduced the finance charge assumption in our determination to reflect our adjustment to the project's efficient capital cost (this is discussed in the enhancements chapter (chapter 9)).

Facility charges – station, depots and track

18.30 There are two types of projects that generate station, depot and track facility charges. First, those projects that are included in Network Rail's SBP. We have used Network Rail's estimates of income as this is based on projects that are already in place but adjusted the income to reflect our 4.91% (real, pre-tax) cost of capital assumption (described in the impact of financial framework on financial parameters chapter

(chapter 13)), as Network Rail assumed in its SBP that the cost of capital would remain unchanged from CP4 (6%).

18.31 Second, there are speculative projects which are not yet known and not included in Network Rail's SBP. We think that it is important that our determination reflects as closely as possible Network Rail's likely income in CP5 and the associated capital expenditure even when the project is not yet specifically known. Therefore, for these projects we have based our assumptions on Network Rail's "central" scenario for these projects, which was for Great Britain £37m per annum (2012-13 prices) of capital expenditure, as this is a reasonable assumption given the uncertainty in this forecast. This is based on the trend in CP4 but excludes large one-off projects like Evergreen and the Nottingham hub, as projects of this magnitude are unlikely to occur with such frequency during CP5. Based on the 4.91% cost of capital (pre-tax, real), we estimate this will yield total income for Great Britain of £58m (2012-13 prices) in CP5.

18.32 We apply a real "vanilla" WACC to government sponsored projects and a pre-tax WACC to other projects. This is because our approach to the calculation of our corporation tax assumptions, in our calculation of Network Rail's revenue requirement, is to base them on forecast cash payments.

18.33 The governments will fund the corporation tax consequences of the projects over the long-term. However, other sponsors of investment framework projects may not still be in place in the future to fund the cash corporation tax payments when they materialise.

Other charges (HS1 and TOC insurance)

18.34 Network Rail has assumed in its SBP that net revenues from HS1 will fall from £10.4m to £6.5m as a result of PR14 (HS1 periodic review). We consider that it is not appropriate to prejudge that process and therefore we have not included that adjustment. Therefore, our assumption is that the income Network Rail will receive from HS1 will be unchanged at £10.4m per annum.

18.35 Following a review by Willis, our insurance consultants, we have not changed Network Rail's forecast of the £3m per annum of income that it is estimating it will receive from insurance recharges in CP5.

Table 18.7 Difference between Network Rail SBP and ORR draft determination for Great Britain

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 Total
Property rental	11.1	40.4	59.7	81.8	107.0	300.0
Property sales	15.0	15.0	15.0	15.0	15.0	75.0
Crossrail finance charge	-2.8	-4.8	-5.8	-7.1	-7.4	-27.9
Welsh Valleys finance charge	-0.1	-0.3	-0.7	-1.5	-2.4	-5.0
Facility charges – station, depots and track	-3.4	-1.1	1.9	4.8	7.8	10.0
Other	0.0	3.9	3.9	3.9	3.9	15.6
Total non-charge related income	19.8	53.1	74.0	96.9	123.9	367.7

19. Financial incentives

Key messages in this chapter

- We are encouraging the industry to work together to improve productivity and reduce costs and to deliver better for its customers. We are doing this by strengthening and developing incentives to better align the interests of Network Rail and its customers, the train operators, and to make Network Rail more commercially responsive to the needs of its customers.
- We are improving the existing efficiency benefit sharing mechanism by replacing it with a route level incentive mechanism. This route level incentive will encourage Network Rail and the operators to work together and allow both to share in efficiency gains or losses on an annual basis.
- To encourage franchised operators to take a more active interest in periodic reviews, we have asked franchising authorities to provide new franchises with exposure to changes that we make to the variable usage charge at future periodic reviews. We will also work with governments to explore how we can increase franchised train operators' exposure to the fixed charge and to changes in it. These are decisions for the governments. DfT has said that it will consider this for future franchises. However Transport Scotland has confirmed that it does not intend to expose the new ScotRail franchise to changes in access charges.
- We are strengthening the incentives for the industry to work together to drive down the costs of infrastructure projects. We want Network Rail and operators to enter into commercial agreements that will reward operators if real cost savings are achieved.
- We support research and development and innovation as a means of improving Network Rail's productivity and reducing its costs in the medium to long term. Subject to a well justified proposal from the company, we will introduce a matched-funding financial incentive whereby we will make provision in the settlement for each additional pound which Network Rail spends on R&D or innovation to be matched (up to a cap), and consider wider changes to the regulatory framework.

Key messages in this chapter (continued)

- We are encouraging Network Rail to act more like a commercial organisation – which makes informed judgements about what amount of capacity to provide, at what cost and to whom. We are doing this by improving the existing volume incentive mechanism. Network Rail has committed to a range of measures to strengthen the way in which it acts on the incentive internally. The incentive will be disaggregated to a route level and we are introducing a downside and increasing incentive payment rates to increase its impact.

Introduction

19.1 This chapter relates to financial incentives. As we described in the overall incentives chapter if Network Rail's income is set at a level which is equal to its costs, since it does not face competition, it has limited incentive to improve its productivity and control its costs. Further, as Network Rail's variable charges do not cover all the costs of providing capacity, the company does not have an incentive to make commercial judgements about whether to accommodate unexpected additional demand for the use of its network.

19.2 A possible solution to this is to design individual charges in a way that provides these incentives, but the current structure of charges does not do this. We are establishing a longer–term project to work with the industry to review the existing structure of charges and to consider how it might be improved, including how the incentive properties of the charges might be strengthened. But, at present, financial incentives are required to supplement the structure of charges and to provide these incentives. In PR13 we have reviewed and modified the existing financial incentives framework to improve its incentive properties by:

(a) developing the existing efficiency benefit sharing mechanism into a **Route-level efficiency benefit sharing (REBS) mechanism.** This incentive is designed to strengthen the alignment of incentives between Network Rail and train operators – through the development of a clear, simple and comprehensive default mechanism in CP5 for Network Rail to share efficiencies with train operators – in order to support greater co-operation to drive down industry costs. It works by

allowing efficiency gains or losses to be shared between Network Rail and its customers (i.e. operators) on an annual basis;

(b) asking franchising authorities to provide new franchises with **exposure to technical (or cost-reflective) changes in the variable usage charge** at future periodic reviews. We will work also with governments to explore how we can increase franchised train operators' exposure to the fixed charge and to changes in it. The rationale is similar to that for REBS but the mechanism works by giving operators a greater interest in infrastructure costs at a periodic review;

(c) strengthening the incentives for the industry to work together to drive down the costs of infrastructure projects and to align scope, specification and delivery of projects better with the needs of the operational railway and its customers. We want Network Rail and operators to enter into **commercial agreements** that will help Network Rail to achieve improvements and reward both parties if these are achieved;

(d) supporting investment in R&D and innovation by introducing a **matched-funding financial incentive and wider regulatory changes,** subject to a well justified proposal from the company; and

(e) developing the **existing volume incentive mechanism** in terms of both its design and payment rates in order to improve its effectiveness. The volume incentive is designed to encourage Network Rail to consider unexpected demand from its customers and in doing so to make trade-offs similar to those made by a company operating in a more commercial setting.

Route-level efficiency benefit sharing

Overview

19.3 In December 2012, we published our decisions on the route-level efficiency benefit sharing (REBS) mechanism[337]. This mechanism is intended to strengthen the incentive to reduce infrastructure costs. It works by increasing passenger and freight train operators' interest in these costs by exposing them to these costs in each year of the control period.

[337] *Aligning incentives: decisions on route-level efficiency benefit sharing (REBS) and train operator exposure to Network Rail's costs at a periodic review*, December 2012, available at http://www.rail-reg.gov.uk/pr13/PDF/aligning-incentives-decisions-dec12.pdf.

Rationale

19.4 In a normal competitive market, when a company reduces its costs, its customers should benefit over time as a result of the lower prices or better service they receive. There are market incentives in place for firms to work together with their suppliers to help reduce their suppliers' costs and for suppliers to encourage them to do so. In the rail industry these normal market incentives are not effective, primarily because franchise agreements provide franchisees with a high degree of insulation from the financial impact of changes to access charges, both upwards and downwards, at a periodic review.

19.5 Ultimately, we want to see the relationships between Network Rail and operators put on to a more commercial footing, in which operators are exposed to changes in Network Rail's costs (through the charging framework) and so have an incentive to help the company to reduce them. There are already cases where train operators are fully exposed to costs, e.g. traction electricity costs and freight and open access operators' exposure to changes in variable charges.

19.6 This exposure has led those train operators to put considerable effort into investigating and challenging Network Rail's costs and efficiency in those areas. But only a very small proportion of Network Rail's total cost base is affected. We are keen to see the level of engagement and challenge that these operators bring, and the extent to which Network Rail and operators work together to identify and achieve cost savings, extended.

REBS decisions

19.7 We are replacing the existing efficiency benefit sharing mechanism (EBSM) with a REBS mechanism. This mechanism will expose train operators to Network Rail's costs in each year of the control period and will:

(a) **operate at a Network Rail operating route level:** EBSM operated at a national level but REBS will operate at a route level to strengthen the relationship between the effort of individual train operators to reduce Network Rail's costs and the pay-outs they receive;

(b) **provide operators with capped upside (25% share) exposure and downside (10% share) exposure to Network Rail's financial performance:** caps limit the risk of gains and losses for operators and the upside/downside exposure

incentivises operators to work with Network Rail regardless of whether it is underperforming or outperforming our determination assumptions;

(c) **have pay-outs which take into account efficiencies achieved in alliances:** this will support industry cost reductions as it provides incentives on Network Rail, the alliance partner, and secondary operators to support route-level cost savings, both inside and outside of alliance arrangements; and

(d) **provide train operators with an opt-out from the mechanism (by route)[338]:** an opt-out provides train operators with the opportunity (but not the obligation) to enter into arrangements to share in Network Rail's performance. Network Rail will be required to make REBS available to all train operators. By the start of the control period, train operators that enter into REBS will have had the opportunity to evaluate the risks involved, i.e. they will have visibility of our final determination and the baselines (which will be set before the start of the control period) and be able to assess the likelihood of outperformance and underperformance.

19.8 REBS provides train operators with the opportunity to receive short-term financial benefits in return for helping Network Rail to deliver long-term industry cost reductions. We consider that the capped pay-outs under REBS represent good value for money in terms of the wider efficiencies they will generate. For example, EBSM pay-outs to train operators totalled £15.9m for the first three years of CP4 but the outperformance achieved is likely to generate significantly higher long-term savings for passengers, freight customers and funders[339]. Furthermore, although the focus of REBS is on outperformance, train operators will also be at risk from underperformance. It is not simply a 'no-lose' situation for train operators.

19.9 We see REBS in CP5 as a stepping stone to the development of more commercial relationships within the industry. As our preference is for more commercial

[338] We understand that the governments will allow new franchised train operators to retain the rewards and costs of participating in REBS but not existing franchised operators. This decision does not affect the ability of open access operators (passenger and freight) to retain the rewards and costs from REBS as they are not covered by franchise agreements. We discuss this issue in more detail later in this chapter.

[339] This is because, whilst train operators benefit immediately from cost savings (via REBS), funders and passengers will benefit in the longer term, i.e. from CP6 onwards from Network Rail's lower cost base and hence funding requirement.

arrangements, we would be content to see train operators opting out of REBS to pursue their own commercially negotiated risk and reward sharing agreements with Network Rail, provided such arrangements were transparent and non-discriminatory[340]. Indeed, we do not necessarily expect REBS to be a long-term regulatory mechanism, but see it as a stimulus for a change in the behaviour of Network Rail and the train operators that will become self-sustaining in the longer term.

Outstanding REBS decisions

19.10 We set out our decisions early (in December 2012) to help the industry factor them into its plans and to provide the industry with greater certainty. But this meant that there were some aspects of the incentive mechanism that were still to be decided. We set out our proposals on the following outstanding issues below:

(a) approach to setting REBS baselines;

(b) methodology for calculating and reporting REBS performance in CP5; and

(c) which elements of Network Rail's income and costs will be included in REBS.

Approach to setting REBS baselines

19.11 In December 2012, we wrote to Network Rail setting out our current thinking on setting REBS baselines[341]. We explained that our main aim was to be able to determine how Network Rail is performing in CP5 relative to our PR13 assumptions. We set out the following principles governing REBS baselines:

(a) we are ultimately responsible for approving REBS expenditure baselines;

(b) baselines should be set before the start of the control period and take into account feedback from other industry participants;

(c) the process and principles for setting baselines and calculating REBS performance should be as transparent and simple as possible, i.e. understandable to those who the mechanism intends to incentivise;

[340] Our statement on alliancing, published in March 2012 is available at: http://www.rail-reg.gov.uk/server/show/ConWebDoc.10854.

[341] This letter is available at http://www.rail-reg.gov.uk/pr13/PDF/rebs-letter-171212.pdf.

(d) baselines must be set so that they are consistent with our overall national-level PR13 determinations, i.e. they should deliver our separate determinations for England & Wales and for Scotland;

(e) baselines should clearly reconcile back to our PR13 route-level cost assumptions;

(f) as far as possible, there should be a single definition for outperformance in CP5 (and hence a set of common baselines), i.e. our definition of outperformance for REBS should be consistent with definitions used elsewhere, e.g. in Network Rail's management incentive plan;

(g) it should be possible to reconcile clearly information in Network Rail's regulatory accounts with our national PR13 determinations, REBS route-level baselines and the annual calculations of route-level out/under performance; and

(h) Network Rail will be responsible for calculating and reporting performance – we expect Network Rail to be transparent in undertaking this activity, particularly where it is required to exercise discretion.

19.12 In its response to our letter[342], Network Rail has suggested that it should have flexibility to set the route-level baselines (through the delivery plan), REBS baselines should not be fixed for the entire control period and that REBS should include Schedules 4 & 8 costs and variable usage charge income (to reflect changes in traffic volumes) but exclude property and other income sources.

19.13 We understand Network Rail's view. We have decided that our PR13 final determination cost assumptions for England & Wales and Scotland will act as REBS baselines in CP5. Network Rail will be able to set REBS baselines for the nine England & Wales operating routes, as long as they reconcile in total back to our national England & Wales level determination assumptions. Network Rail will be required to agree route-level REBS baselines for CP5 prior to the start of the control period so that train operators have sufficient time to decide on whether to enter into REBS.

[342] Network Rail's response can be found via the following link: http://www.networkrail.co.uk/WorkArea/DownloadAsset.aspx?id=30064784819.

19.14 We can see the rationale for allowing certain changes to REBS baselines. We recognise that adjustments may sometimes need to be made to reflect factors such as the re-profiling of a major cost-saving (or income generating) scheme within the control period. But we do not agree that Network Rail should be allowed to make annual adjustments to the previous year's REBS baseline. This approach will provide certainty for train operators, while allowing Network Rail and train operators to propose and, after having consulted, refine the route-level income and cost assumptions prior to the start of the control period. We propose to hold a workshop on setting the REBS baselines with the industry ahead of final determination.

Methodology for calculating and reporting REBS performance in CP5

19.15 In chapter 23 of this document, we set out how we will measure and report on Network Rail's financial performance in CP5. This issue is closely linked to REBS because the decisions we make in this area are likely to be a significant factor when train operators are considering whether to take part in REBS.

19.16 Chapter 23 explains how our approach to measuring Network Rail's financial performance will focus on a comparison between Network Rail's total financial performance and our PR13 determination income and cost assumptions. We want REBS to be consistent with this wider approach so that our decisions on REBS pay-outs are more transparent and so that they are consistent with our view on Network Rail's total financial performance. By consistency, we do not mean that the measure of performance for REBS will exactly reflect the measure of total financial performance. Instead, our approach will be consistent (e.g. aligning performance measure with the RAB roll forward) for the incomes and costs that are included in REBS.

19.17 Fixed baselines provide certainty for participants in REBS. However, this approach does present risks if Network Rail makes significant changes to spend profiles on certain routes within the control period. To address this issue the REBS baselines will remain fixed for the control period but with any significant changes to Network Rail's income and costs within the control period reflected in annual adjustments to the level of REBS performance.

19.18 In chapter 23, we set out how our measure of total financial performance in CP5 will include adjustments to Network Rail's overspend or underspend against our determination assumptions to better reflect Network Rail's actual performance, e.g.

adjusting for rescheduling of capital schemes. REBS performance will already reflect these changes, and so to maintain a stable mechanism, we expect to only approve adjustments to REBS performance in exceptional circumstances, i.e. we do not anticipate significant regular annual adjustments, over and above those reflected in the measure of total financial performance.

19.19 The only additional adjustments that we will consider making to the measure of REBS performance are where:

(a) Network Rail makes a significant change to its spend profile in a particular route, e.g. Network Rail re-profiles the roll-out of its network operating strategy, where these changes could not have been reasonably known before the baselines were set; or

(b) Network Rail makes material changes to the methodology for allocating costs between operating routes.

19.20 We consider that by allowing these adjustments, we will reduce the potential for windfall gains and losses for train operators.

Specific elements of Network Rail's income and costs that will be included in REBS

19.21 In our December 2012 decisions document, we set out our current thinking on the income and costs that should be included within REBS. We have not changed our view since December 2012.

19.22 We will include within REBS only those elements of Network Rail's costs and incomes that we consider train operators are able to influence. On this basis, REBS will include the following[343]:

(a) support costs;

(b) operations costs;

(c) maintenance costs;

(d) renewals costs[344];

(e) Network Rail's share of RSSB and BTP costs;

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[343] While REBS pay-outs will take into account efficiencies achieved in alliances, the calculation of financial performance will include alliance payments before REBS.

[344] Due to the separate treatment of renewals of civil structures in PR13 we will exclude the impact of volume changes of renewals of civil structures in CP5 for financial performance purposes.

(f) Schedule 4 & 8 costs;

(g) property income; and

(h) variable usage charge income[345].

Our indicative REBS baselines are shown in annex D.

Approach to calculation and payment under REBS

19.23 REBS will be implemented via track access contracts and a draft of the contractual mechanism with supporting explanation will be set out in our consultation on 12 July 2013.

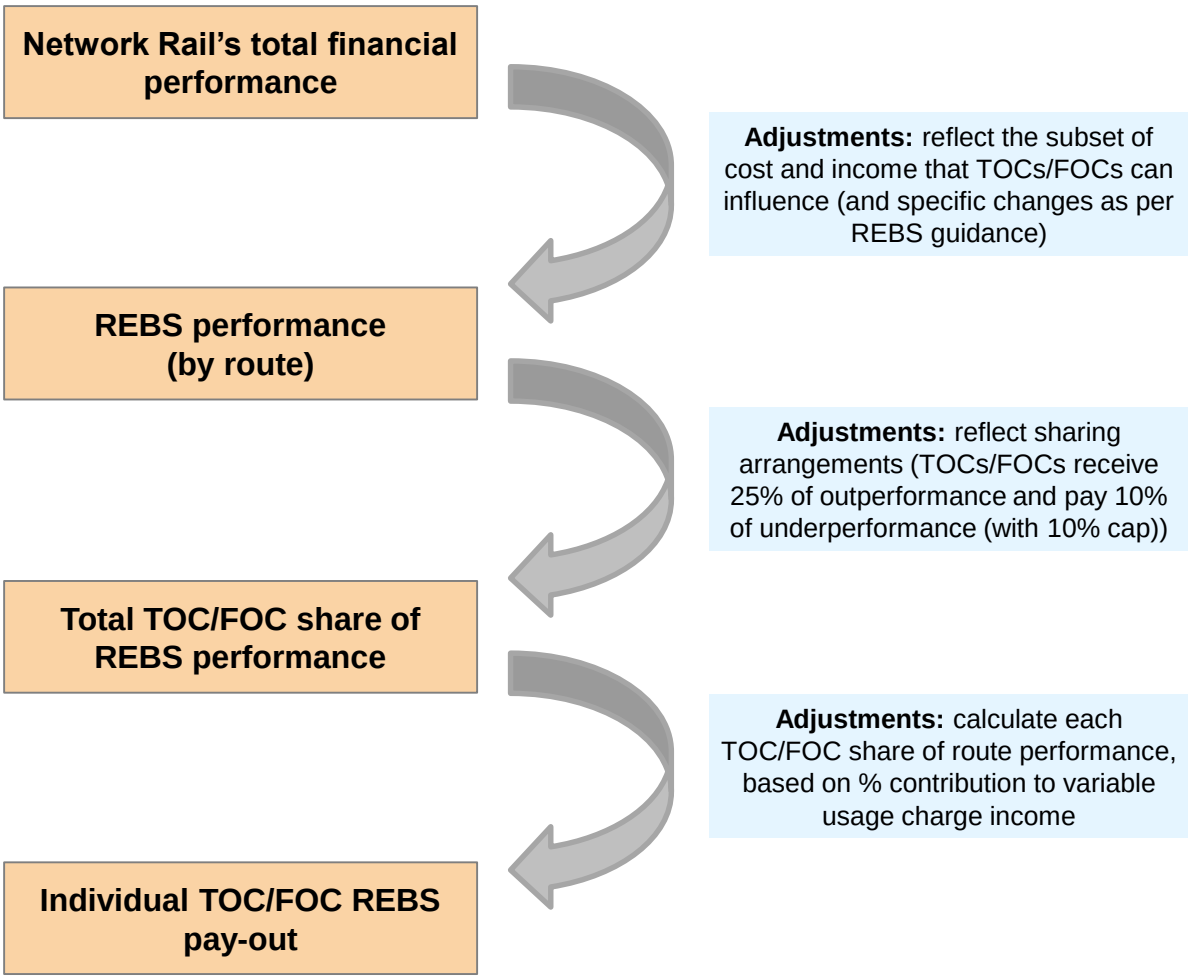
19.24 The value of any EBSM payments is currently set out in our annual efficiency and finance assessment of Network Rail. For REBS to provide a real incentive to train operators, we believe it is important that payments are made on an annual basis and so we will retain this approach in CP5.

19.25 REBS performance will be consistent with our assessment of Network Rail's cumulative outperformance of REBS baselines for the control period up to the point of the assessment. We expect that REBS pay-outs relating to the prior year will be made soon after we have published our annual assessment (usually in the autumn).

19.26 Figure 19.1, shows the steps for calculating REBS pay-outs to train operators.

[345] We have excluded volume incentive income from the measure of REBS performance. The volume incentive is in place to incentivise Network Rail to improve its responsiveness to unexpected demand for network capacity. The benefits of accommodating this extra demand should flow to operators through increased revenue. Given our view that REBS should include costs and income that train operators are able to influence, and to avoid the possible double counting of the benefits of additional access to capacity, we think that it is appropriate to exclude volume incentive income from REBS.

Figure 19.1: Steps to calculating REBS performance and pay-outs



19.27 As with EBSM, any REBS pay-outs will be in cash. This will provide a strong incentive to operators and is administratively straightforward. Train operators will receive REBS pay-outs based on their share of variable usage charge income on each route. This approach has the benefit of capturing an element of the scale of an operator's services as well as the overall impact that services have on Network Rail spending at the margin.

Franchising considerations

19.28 In CP4, the majority of franchised train operators are not eligible to receive pay-outs under EBSM because the governments were unwilling to waive the clause 18.1/schedule 9 (no net loss, no net gain) provisions in existing franchise agreements. However, in CP4, DfT agreed to waive this provision for new franchises.

19.29 Throughout PR13, both governments have been supportive of REBS and we understand that they will both allow new franchises (let through open competition) to enter into REBS, i.e. to retain the potential benefits and costs from the mechanism.

Prior to DfT issuing its revised rail franchise schedule[346], published in March 2013, this would have resulted in a significant number of franchises being eligible for REBS from the start of CP5. However, the revised England & Wales rail franchise timetable includes a number of negotiated Direct Awards with existing franchisees and this has the effect of reducing the number of franchised operators eligible for REBS from the start of CP5[347].

19.30 So, in summary, DfT has said that for new competitively let franchises, the franchise agreement will allow train operators to benefit from REBS but this will not apply to negotiated Direct Awards with existing franchises. Transport Scotland has said it will adopt a similar position for the next ScotRail franchise.

19.31 Although the latest franchise timetable may initially reduce the coverage of REBS (compared to our initial expectation), we think that it is still appropriate to implement REBS at the start of CP5 as this will allow open access operators (passenger and freight) to enter into REBS, as well as those new franchises that are due to start in the first year of CP5[348]. As franchises are re-let in CP5, the coverage of REBS should increase.

Exposing franchised train operators to changes in Network Rail's costs at a periodic review

19.32 In most regulated industries, the customers of the regulated companies have an incentive to engage with a periodic review, challenging the regulated companies' costs (including scope of work and unit costs) to secure lower regulated prices. They do this because they benefit from these lower prices. In rail, franchised train operators currently do not have this incentive because they are held neutral (with some exceptions) through their franchise contracts to changes in Network Rail's access charges as a result of our periodic reviews.

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[346] DfT's revised rail franchised schedule is available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/170565/rail-franchise-schedule.pdf.

[347] DfT has indicated that for existing franchised operators (including those receiving short-term contract extensions) it will require franchisees to opt-out of REBS. This issue does not affect open access operators (passenger and freight) as they do not have the same agreements with governments.

[348] The DfT rail franchise schedule indicates that the following new franchises will start in the first year of CP5: Essex Thameside; Thameslink, Southern and Great Northern; and East Coast.

19.33 To complement our decisions on REBS, in December 2012, we decided that rather than implementing a new regulatory mechanism to address this issue, we will instead ask franchise authorities to provide new franchises with exposure to technical (or cost-reflective) changes in the variable usage charge[349].

19.34 This approach has broadly the same objective as REBS (i.e. to strengthen incentive alignment). But instead of incentivising within control period efficiencies, it encourages train operators to engage with us and Network Rail during the periodic review process to drive down industry costs.

19.35 However, given the proportion of Network Rail's costs that are recovered through the fixed charge, we also explained in December 2012 that we think that exposing franchisees to changes in the fixed charge would generate further efficiency savings by increasing train operators' interest in Network Rail's costs at a periodic review.

19.36 The decision on whether to increase franchised train operator exposure to changes in Network Rail's charges is ultimately for the governments to make. DfT has said that it will consider this for future franchises. However Transport Scotland has confirmed that it does not intend to expose the new ScotRail franchise to changes in access charges.

19.37 We recognise that providing exposure to changes in Network Rail's fixed costs is a significant departure from existing industry arrangements and would expect that any further exposure to Network Rail's costs, i.e. exposure over and above changes in the variable usage charge, would be phased in over more than one control period (i.e. from CP6 onwards).

Enhancements efficiency benefit sharing

19.38 We are proposing to strengthen the incentives for the industry to work together to drive down the costs of infrastructure projects. We want Network Rail and operators to enter into commercial agreements that will reward operators if real cost savings are achieved. We believe this is a powerful tool to enable Network Rail to out-perform the PR13 settlement. It has been used before in CP4, but only for a minority of projects.

[349] This change would only impact new franchised train operators from CP6, i.e. as a result of changes that we may make to Network Rail's track access charges at our next periodic review.

19.39 Network Rail can already enter in to arrangements with train operators who want to fund additional enhancements or share the revenue gains or savings from such investment.

19.40 The commercial agreements would be for Network Rail and operators to agree on a case by case basis. The agreements could be at an individual project level, a route-based level, or a portfolio level. Network Rail would set a baseline project cost and would need to define a corresponding output consistent with the HLOS. The aggregate costs would need to be within the PR13 capped portfolio costs as explained above. This incentive is described in more detail in chapter 9.

Research & development and innovation

19.41 We support research & development (R&D) and innovation. Increased emphasis on R&D and innovation is likely to improve Network Rail's productivity in the long-run. Low levels of R&D and innovation have been identified by several studies as a reason for poor productivity in the rail industry. The Rail Value for Money study identified the potential for significant annual savings from 'safety, standards and innovation' by the final year of CP5. Investment can be risky but returns on investment can be high.

19.42 There are reasons why Network Rail's incentive and ability to invest in R&D and innovation may not be as strong as it could be. For example, Network Rail argues that the gains from innovation are accrued over the long-term while the costs are short-term. The resetting of the price control only allows it to retain the benefits of innovation over a five year period – over which time it may not be compensated fully for the risk of the investment.

19.43 The recognised importance of innovation and R&D led to £50m for cross-industry innovation being included in the Secretary of State's HLOS, which Network Rail will be able to access. Subject to a well justified proposal from the company, we will introduce a matched-funding financial incentive whereby we will make provision in the settlement for each additional pound which Network Rail spends on R&D or innovation to be matched (up to a cap), and consider wider changes to the regulatory framework. The matched funding incentive would apply to every additional pound, beyond that assumed elsewhere in the PR13 determination, which Network Rail commits to spend on R&D or innovation.

19.44 This approach should encourage Network Rail to consider carefully the risks and rewards since the approach involves it committing its own money – sourced through outperformance or through third party funding - thus introducing a form of governance. To minimise the cost of any further governance and provide read-across, we would propose to subject the matched funding to the same governance arrangements as the HLOS funds, which are being discussed currently.

19.45 Network Rail should set out its proposals on matched funding ahead of the final determination and provide its view on how we might best develop the regulatory framework to encourage R&D and innovation. In particular, it should demonstrate:

(a) whether a matched-funding financial incentive would allow Network Rail to attract third party investment such as venture capital or other forms of financing and if not what modifications would be necessary;

(b) how Network Rail would envisage sharing the rewards or benefits of any investment with others such as its supply chain and any third party funders and what it considers these benefits are likely to be; and

(c) how Network Rail would envisage sharing the risks of any investment with others such as its supply chain and whether the scale of these risks can be viewed as a reasonable part of its overall balanced portfolio of risks.

Volume incentive

Overview

19.46 In December 2012, we published our PR13 consultation on the volume incentive[350]. This incentive is intended to encourage Network Rail to be more responsive to unexpected demand for network capacity over and above an agreed growth baseline level. Volume incentive payments of £68m have been credited to Network Rail for the first four years of CP4.

Rationale

19.47 One of Network Rail's functions is the efficient management of existing network capacity. It is important that Network Rail is incentivised to make network capacity available in response to unexpected demand. In a more commercial setting, Network

[350] *Volume incentive consultation*, December 2012, available at http://www.rail-reg.gov.uk/pr13/consultations/volume-incentive.php.

Rail would face such an incentive as a result of having a more commercial set of relationships with its customers – relationships in which the company profited by selling more of what its customers wanted, i.e. the use of network capacity.

19.48 The volume incentive should encourage Network Rail to think about the provision of network capacity to its customers in a more commercial way. This involves making trade-offs when deciding whether to meet unexpected demand.

Our December 2012 consultation on the volume incentive

19.49 Responses to our consultation earlier in PR13 confirmed our view that the volume incentive is not fully effective currently in performing its intended role. Many respondents believed that the volume incentive has not been effective principally because it is neither visible to nor well understood by decision makers within Network Rail. So, in our December 2012 consultation document, we put forward a range of measures to improve the effectiveness of the volume incentive.

19.50 In our consultation, we asked Network Rail to put forward proposals on how it will improve understanding of, and engagement with, the volume incentive at a route level where decisions on capacity are taken, for example by attributing incentive payments to its individual operating routes and so linking it to the decision makers.

19.51 We consulted on a range of changes to the design of the incentive including disaggregating the incentive to an operating route level where decisions on capacity allocation are made, the possible introduction of a downside to make the incentive operational in a greater range of circumstances, and whether we should continue with the existing payment mechanism which defers payment to the next control period.

19.52 Finally we consulted on whether we should continue to use the existing approach to calculating the incentive rates – and what other approaches might exist. And we recalculated the incentive payment rates using broadly the existing approach, but with new evidence[351], and arrived at passenger and freight rates which were significantly higher than those used in the current control period.

[351] See *Volume incentive consultation*, December 2012, for details of new evidence.

Volume incentive proposals

19.53 We received 15 responses to our consultation[352]. At the end of January 2013 we held a small, focused stakeholder workshop to discuss the consultation and to understand better the wider views of the industry on the effectiveness of the incentive. We have considered this stakeholder feedback and carried out quantitative analysis to assemble an evidence base to inform and support our approach. We have also drawn on discussions at external meetings with Network Rail, DfT and Transport Scotland.

19.54 Our approach is summarised below, then described in more detail:

(a) **overall effectiveness:** Network Rail has committed to a range of measures to strengthening the transmission mechanism in CP5;

(b) **disaggregation:** the incentive will be calculated relative to disaggregated route level growth baselines while maintaining national incentive rates;

(c) **downside:** we will introduce a downside with symmetric payment rates around expected growth baselines. We will introduce a national ceiling and floor on total payments over the control period;

(d) **payment mechanism:** we will continue to allow accrual of payment for release over the next control period, but amounts will be calculated and credited to the routes on an annual basis;

(e) **other design issues**: we will continue to allow for all growth, to apply the incentive to all routes and to exclude commodities that are subject to mark-ups such as the freight specific charge and the freight only line charge (data allowing);

(f) **baselines:** we will set a total national growth baseline for each of the metrics and work with Network Rail to translate these into annual route baselines ahead of the start of the next control period;

(g) **metrics:** we will continue with all four existing metrics of farebox and passenger train miles for passenger volumes and freight train miles and freight gross tonne miles for freight volumes; and

[352] Consultation responses are published on our website at http://www.rail-reg.gov.uk/pr13/consultations/volume-incentive.php.

(h) **incentive rates:** we will continue with the existing approach to calculating incentive rates and adopt the updated version of these incentive rates included in our December 2012 consultation.

Overall effectiveness

19.55 Almost all respondents to the December consultation were supportive of the need for a volume incentive, at least in the short term. But there was a clear message that the incentive has not been properly effective to date and that it needs to be improved going forwards. While respondents were broadly supportive that we are considering the 'right' design areas to improve its effectiveness, particularly disaggregation, there was the sense that something else is needed to improve the transmission mechanism and the way in which Network Rail thinks about, and acts on, the volume incentive internally.

19.56 Getting the transmission mechanism right is a matter for Network Rail. In April 2013, we wrote to Network Rail asking it to identify and commit to changes by building on the ideas in its response to the December 2012 consultation. Network Rail responded to us in April 2013 suggesting a combination of approaches outlined below. In its letter, Network Rail stated that it plans to consult on its proposals once ORR has concluded on the volume incentive policy for CP5. Network Rail proposed that:

(a) volume incentive payments will be included in the Financial Value Added (FVA) measure, a measure of Network Rail's outperformance. Under the current staff incentive arrangements, this will have an impact on the level of payments to senior Network Rail staff;

(b) the payments to senior route-based staff will also be affected through inclusion of the routes' performance against traffic targets in routes' FVA. Senior staff working centrally would be affected by the sum of the routes' performance against the national volume incentive baselines;

(c) baseline and outturn traffic figures will be published at a route level in Network Rail's annual regulatory accounts; and

(d) where there is overall outperformance against the volume incentive baseline, Network Rail will make decisions centrally about how to use any gains but routes would make proposals about ways of spending outperformance, which would be judged against 'payback' criteria. Network Rail will also work with passenger and

freight operators through existing processes and report on how it spends any outperformance in its regulatory accounts.

Disaggregation

19.57 Most respondents supported disaggregating the incentive as this could potentially increase visibility and effectiveness. Among passenger operators and their representatives (including ATOC), there was broad support for disaggregating the growth baselines to a route level with a national incentive rate. A few respondents felt that the disaggregation should be at a more granular level, or include disaggregation of the incentive rates, to better account for the variation in the social value of rail by region. Freight operators (and freight customer representatives) expressed concerns about disaggregation. Respondents felt it would add unnecessary complexity as most freight flows do not map neatly onto Network Rail's operating routes. DfT and Network Rail were broadly supportive of disaggregation, with Transport Scotland also favouring disaggregation below the route level. A majority of respondents did not support an alternative form of disaggregation e.g. by TOC.

19.58 Growth baselines will be disaggregated but we will maintain national incentive rates. Disaggregated route level data on passenger train miles, freight train miles and freight gross tonne miles exists already. Disaggregated route level farebox data does not exist but we are working to create these baselines. We consider that this approach is consistent with the majority of stakeholder feedback and could increase effectiveness of the incentive by improving visibility and targeting route based decision makers. The approach could also allow us to gain valuable knowledge/ data to inform future work on the charging framework. Going further and disaggregating incentive rates is unlikely to result in more appropriate incentive rates being applied to particular volume increases, as we would expect rates to vary more within routes than between them.

Downside

19.59 Most respondents to the December consultation were in favour of a downside to the volume incentive and many made statements supporting our principles for having a downside (e.g. keeping the incentive effective at all times, mitigating incentives to reduce volume). Some respondents who were less supportive of the volume incentive as a whole also expressed doubts about a downside. The Rail Freight Group suggested that the downside will be difficult to implement and may be perverse or counter intuitive. Network Rail "recognise ORR's arguments in considering introducing

a downside" but proposed that in order to manage risk, a downside should be capped at the national level. Several respondents expressed concerns around Network Rail being exposed to risks outside its control, especially for freight volumes, and there was support for a floor on payments.

19.60 We will introduce a downside for CP5, with symmetric incentive rates so that the same rates apply to both the upside and the downside. We consider that, on balance, a downside will improve the effectiveness of the incentive by removing the uncertainty over whether the volume incentive will apply to a specific increase in volume, since currently it works only if volumes are above the baseline. Symmetric rates eliminate any uncertainty over which rates might apply to a given increase in volume. The downside should mitigate Network Rail's incentive to reduce volume under pressure from the performance regime, keep the incentive working when volumes fall below the baseline (e.g. in recessions) and strengthen the incentive for Network Rail to proactively expand capacity. A downside will interact with disaggregation by allowing netting off of payments from routes that are below the baseline from those that are above the baseline.[353]

19.61 We will introduce both a ceiling and a floor on payments under the volume incentive. The floor will cap downside payments from Network Rail. The ceiling will cap upside payments from governments. While we did not consult explicitly on a floor and ceiling in our December document, a floor is supported by several consultation responses, mainly to mitigate risk to Network Rail particularly amid concerns that the downside exposes Network Rail to risks beyond its control. And we consider the ceiling to be an important feature of the incentive since we propose to introduce higher incentive rates but our statutory duties require us to take into consideration government finances and affordability.

19.62 We propose to introduce a floor of -£300m and a ceiling of +£300m for CP5. The levels of the floor and ceiling are based on analysis of possible payment scenarios under different assumptions on background growth in passenger and freight demand and the timing of the delivery of major capacity based enhancements. The floor and

[353] Under the CP4 incentive design, the volume incentive payment is calculated at the national level and so volumes below the baseline level on one route could be offset by those above the baseline on another route. If in CP5 disaggregation was introduced without a downside, for many patterns of volume increases the payment would be higher than in CP4, because volumes below the baseline for some routes would not be offset by volumes above the baseline for other routes.

ceiling are intended to balance the risk of the incentive becoming inactive (achieved by setting the levels of the floor and ceiling so that they are relatively unlikely to become binding), against affordability concerns for both governments and Network Rail. We have illustrated this in the penultimate section of this chapter.

19.63 The baseline will reflect expected growth, and it is our intention currently that this is based on Network Rail's traffic model and DfT farebox projections. Setting the baseline at expected growth, with symmetric incentive rates, gives the incentive an expected value of zero. A baseline set below expected growth might require a corresponding adjustment to fixed charges for a positive expected value of the volume incentive. This adjustment would avoid Network Rail receiving a volume incentive payment for volumes that it was expected to deliver and for which it had been paid already. An expected growth baseline means that positive and negative volume incentive payments are easily interpreted, which might contribute towards improving the transmission mechanism.

Payment mechanism

19.64 At present, the volume incentive is calculated annually, but paid over the subsequent control period through the opex memorandum account, with regard to affordability. Most respondents to our December consultation, including Network Rail, supported the continuation of payments through the opex memorandum account. They did not think that the deferral of payment affects incentives or if it does, that this is a secondary issue, and that it is the transmission mechanism which is the most important driver of effectiveness. And both Transport Scotland and DfT stated clearly that the timing of payment to Network Rail will affect affordability for funders. But nearly all respondents supported the annual calculation and crediting of incentive payment amounts to the individual routes.

19.65 We will continue with the existing payment mechanism, with volume incentive amounts accrued in the opex memorandum account and paid over the subsequent control period, profiled according to affordability. Most respondents are supportive of the existing mechanism, or have little appetite for change. Deferred payments are more likely to be affordable for funders and allow for netting off of underperformance, and a more immediate payment mechanism may not be practical and appropriate. However, Network Rail will calculate and credit the amounts to its routes on an annual

basis. These amounts will be used to inform the reward package for route level managers.

Other design issues

19.66 Most respondents opposed crediting the volume incentive only in congested areas of the network, mainly because of difficulties with the definition and measurement of congestion. The majority of respondents said that Network Rail should be credited for all volume growth, some because of the need to incentivise Network Rail to accommodate all volume, whatever its cause, and some because of the practical problems in distinguishing what Network Rail had caused.

19.67 We consulted on excluding ESI coal and spent nuclear fuel. When coal was excluded in PR08 it was argued that coal was 'captive' to rail and did not need an incentive for that reason. Network Rail supported that as did Freightliner (with some concerns about Scottish coal) and RfG (who wanted to ensure biomass attracted the volume incentive). Arriva supported it but not if there were data problems at the route level. DB Schenker, Transport Scotland, Centro and PTEG did not support the exclusion or did not see the point of it.

19.68 We propose to continue to apply the incentive to all routes since congestion may not necessarily be correlated with high value volume and we expect that it will be difficult to measure. We propose to continue to include all growth regardless of who has driven that growth. Our rationale is that all volume is valuable and separating Network Rail-caused volume is both difficult and could set the wrong target. We propose to continue to exclude commodities that are subject to mark-ups (data allowing) such as the freight specific charge and the freight only line charge. Our rationale is that these mark-ups provide an incentive for volume that does not need duplicating.

Metrics

19.69 In their responses to the December 2012 consultation, Network Rail and some freight operators commented that for freight, more weight should be put on the gross tonne miles measure, in order to incentivise more efficient traffic growth. In our January 2013 workshop the Rail Freight Operators' Association said that all the measures should in fact relate to better use of available capacity rather than encouraging more capacity. Centro argued that a metric which focuses on train miles

is likely to incentivise long-distance services (passenger or freight) rather than short-distance passenger commuter services.

19.70 We propose to continue with all four existing metrics. We have considered the consultation responses and discussed the availability and potential vulnerabilities of the existing metrics with Network Rail and DfT (who hold farebox data). Train miles metrics are not entirely satisfactory because they could encourage empty trains and longer distance volumes, and growth in farebox could reflect developments outside Network Rail's control such as changes to wider government policy. However, loss of either the train miles or farebox metrics without a satisfactory substitution could reduce the effectiveness of the incentive since the broad scope represents a range of different values. In recognition of these concerns we will allow for the re-opening of the farebox baseline in control period if it is clear that it will be affected by a change in fares policy, and we are confident that we can isolate that effect.

Baselines

19.71 In the workshop and in its response to the consultation, Network Rail suggested that ORR should set a national growth baseline, and then it, in consultation with operators, would set route level growth baselines. In its consultation response, Network Rail also argued that by continuing to apportion growth over a control period equally between the five years, the baseline is likely to be unachievable in the early years of CP5. This is because growth is not forecast to be uniform over CP5, but concentrated in the final years of the control period when a number of capacity driving enhancements e.g. Thameslink, Crossrail are due to be completed.

19.72 We will specify an expected national growth baseline for each metric in our final determination. We recognise that the delivery of a number of capacity enhancing projects in CP5, which are due to complete towards the end of the control period, increases the importance of considering whether, for example, the growth forecasts included in Network Rail's current traffic forecasting model remain an accurate representation of expected growth. Therefore, we will work closely with Network Rail to ensure that the baselines are as accurate as possible. It is important that the baselines continue to reflect expected growth and that they are not in any way 'softened' to mitigate the risk of the downside – which is a risk that we will deal with through introducing a floor on the downside payment.

19.73 Draft national growth baselines for passenger train miles, freight train miles and freight tonne miles are shown in Table 19.1 below, based on the extract from Network Rail's traffic forecasting model included in its SBP and expressed as average annual growth over CP5. The growth rates for the freight metrics are for chargeable traffic. A draft national growth baseline for farebox, based on the DfT Network Modelling Framework, is also shown in this table[354]. In the table, we have shown these draft baselines next to the CP4 projections. As well as considering the timing and effect of capacity improving enhancements, we will need to update these draft baselines to reflect expected freight volume growth forecasts currently being consulted on as part of the Freight Market Study[355].

Table 19.1: Draft national baseline growth rates

Average annual growth rates	Draft CP5 projection	CP4 projection
Passenger train miles	1.3%	0.8%
Farebox	3.6% (real)	4.7% (real)
Freight train miles	5.5%	2.3%
Freight 1,000 gross tonne miles	6.0%	1.6%

19.74 We will work with Network Rail to translate expected national growth forecasts into annual route-level baselines ahead of the start of CP5. ORR understands that Network Rail intends to consult on route level baselines when it publishes its draft delivery plan in December 2013. Baselines must be set before the beginning of CP5 and adjustments to route level baselines must be neutral in aggregate relative to the expected national growth baselines specified by us in the final determination. We will agree the principles for disaggregation with Network Rail in advance of its delivery plan consultation, and review the proposed route-level baselines before these are put in place for the beginning of CP5.

[354] The DfT Network Modelling Framework is a strategic modelling tool which can provide, among other things, high level demand and revenue forecasts.

[355] The Freight Market Study consultation – published on Network Rail's website - see http://www.networkrail.co.uk/improvements/planning-policies-and-plans/long-term-planning-process/market-studies/freight/ - is part of the rail industry's Long Term Planning Process and sets out how freight demand is expected to change over the next 30 years.

Incentive rates

19.75 A majority of consultees supported the retention of the current value-based approach to calculating the incentive rates. A majority of respondents commented that regardless of the size of the payment, the transmission mechanism is the key factor in ensuring that the incentive is effective. Some respondents suggested that there would be merit in moving to a cost based approach for the volume incentive, but recognised that it seems unlikely that this could be implemented in a robust way at this time. Network Rail expressed support for strengthening the incentive by increasing the incentive rates. Freightliner commented that in the case of freight, in addition to the size of the incentive rates, setting a realistic baseline is also a key factor in ensuring the incentive is effective.

19.76 We will continue with the existing method of calculating incentive rates and adopt the updated version of those rates included in the December consultation and shown in Table 19.2[356]. Most respondents are supportive of this approach and there appears to be little interest in the 'higher rate alternative' which we also consulted on in December at least until there is full confidence in the effectiveness of the transmission mechanism. The higher rate alternative would also be of concern to funders since it could raise affordability issues.

19.77 We have considered whether the incentive rates should be revisited in the light of our decision not to change capacity charge rates as described in chapter 16. This decision means that Network Rail will not be fully compensated for the costs to it of additional performance payments resulting from increased traffic and so provides a disincentive to volume increases. Even higher volume incentive rates could offset this disincentive, as the volume incentive is intended to strengthen the incentive for Network Rail to accommodate additional volumes. However, our decision on incentive rates and payment caps reflects a balance between strengthening the incentive and considering affordability concerns for governments and Network Rail, as described below. An increase in incentive rates without a corresponding change in payment caps would significantly increase the risk of the incentive becoming inactive, whereas an increase in caps would increase affordability concerns. To maintain this balance of

[356] These rates have been updated for RPI inflation compared with those published in the December consultation.

effectiveness and affordability, we do not intend to increase the incentive rates for this purpose.

Table 19.2: Incentive rates

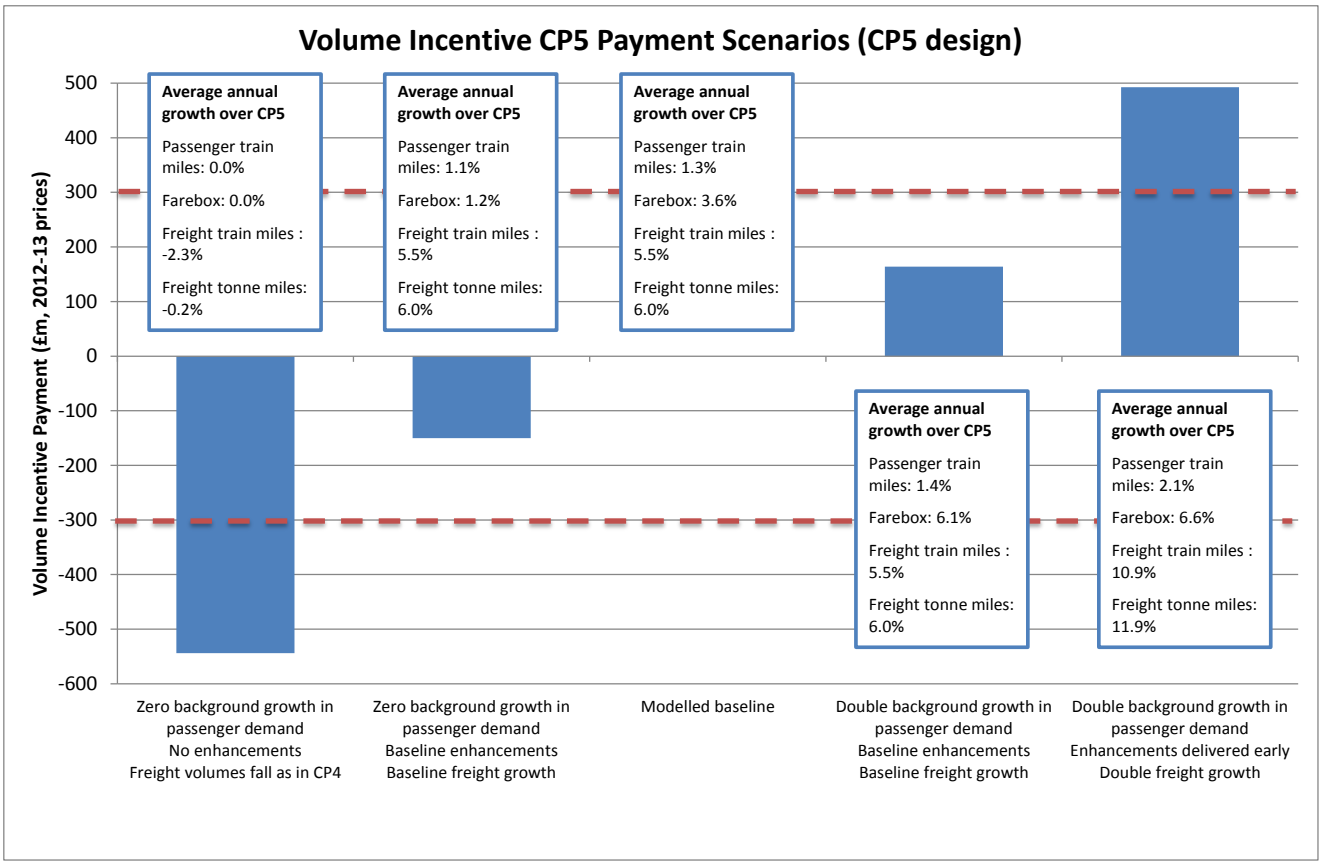
	Refreshed CP5 value (2012-13 prices)	CP4 value (2006-07 prices)	CP4 value (2012-13 prices)
Per additional train mile	141p	69p	84p
% of additional farebox revenue	2.5%	1.5%	1.5%
Per additional freight train mile	284p	111p	136p
Per additional freight 1,000 gross tonne mile	242p	100p	122p

Payment scenarios, caps and payment rates

19.78 Figure 19.2 below shows how a ceiling and floor set at +/- £300m would mitigate the risk around the magnitude of payments should traffic growth be significantly above or below the growth baselines set before the start of CP5 using existing draft baselines. The scenarios reflect different assumptions on passenger and freight demand and on the timing of the delivery of major capacity improving enhancements. We have not associated specific probabilities with these illustrative scenarios, although we consider the more extreme scenarios to be relatively unlikely to occur.

19.79 The level of the floor and ceiling is intended to balance the risk of the incentive becoming inactive (achieved by setting the levels of the floor and ceilings so that they are relatively unlikely to becoming binding), with affordability concerns for both governments and Network Rail. While the modelled scenarios have informed our proposal of a ceiling and floor of +/- £300m, the ceiling and floor put in place must also be considered in light of other aspects of the PR13 settlement. For example, our decision on the cap on the level of the variable usage charge means that if Network Rail was to deliver volumes below the baseline, since the variable usage charge is to be set below the level of cost directly incurred, it would effectively over-recover, offsetting some of the potential downside experienced through the volume incentive.

Figure 19.2: Volume incentive CP5 Payment Scenarios



Views on proposals

19.80 We would welcome views on our detailed approach to the volume incentive in CP5 as set out in paragraphs 19.46-19.79 above. We would particularly welcome views on our proposed approach to working with Network Rail to set expected route-level growth baselines and to mitigating risk to Network Rail and governments by setting a national ceiling and floor on payments under the volume incentive of +/- £300m over the whole of CP5.

20. Possessions and performance regimes

Key messages in this chapter

- The Schedule 4 ('possessions') regime compensates train operators for the financial impact of planned possessions – where operators cannot access the network because Network Rail is carrying out engineering work. The Schedule 8 ('performance') regime compensates train operators for unplanned service disruptions caused by Network Rail and other train operators.
- **We are retaining Schedules 4 and 8 so they mainly operate as 'liquidated sums' regimes**, where compensation (and bonus) payments are largely determined in advance by set formula. This reduces transactions costs in the industry, because the alternative would be to negotiate the financial impact of each incident after the incident;
- **We have updated Schedule 4 and 8 payment rates so they reflect the best available evidence** of the impact of possessions and poor performance on revenue and costs. We are still finalising payment rates. This is due to the timings of an industry led update of the evidence on how passenger demand responds to poor performance and some concerns Network Rail has raised regarding the methodology for calculating Schedule 8 payment rates for London & South East commuter services, which it recently consulted on. Passenger Schedule 8 payment rates, and to a lesser extent Schedule 4 payment rates, are expected to increase considerably. This is due to large increases in passenger numbers, above inflation increases in fares on some services and updated evidence showing passenger demand responds more to service disruption than previously thought. The increase in Schedule 4 payment rates will result in an increase in Network Rail's funding requirement, most of which will be reflected in an increase in the Schedule 4 access charge supplement paid by train operators. The increase in Schedule 8 payment rates will not result in an increase in Network Rail's funding requirement, since Schedule 8 is financially neutral when Network Rail and train operators perform in line with our expectations.

Key messages in this chapter (continued)

- The increase in Schedule 4 and 8 payment rates will **increase the financial incentive on Network Rail to minimise planned and unplanned service disruption to passengers** and also ensure train operators are adequately compensated. This is because Network Rail will have to pay a higher amount of compensation for each minute of lateness it causes;
- **We are updating performance benchmarks in Schedule 8**, including ensuring Network Rail's performance benchmarks reflect the output targets we set for CP5.
- We have improved other aspects of Schedules 4 and 8 to make sure they function effectively, do not result in perverse incentives, and work overall in the best interests of passengers, freight customers and taxpayers. This includes incentivising Network Rail to reduce instances of booking unnecessary possessions early and then cancelling them at short notice; and reducing compensation to cover replacement bus costs so it is in line with actual bus costs.

Introduction

20.1 Passenger train operators are concerned about the performance of their services because of the adverse impact on their customers of poor reliability, which over time leads to lower passenger numbers and revenues. Freight operators are concerned about the performance of their services because of the costs incurred, e.g. additional crewing costs, and because of the impact on revenue through the loss of customers.

20.2 The possessions and performance regimes (Schedules 4 and 8) in track access contracts perform the following functions:

(a) compensate train operators for the financial impact of planned and unplanned service disruption attributable to Network Rail and other train operators;

(b) help align incentives between Network Rail and train operators, so the impact of service disruption on revenue and/ or costs is incurred by the organisation to whom the disruption is attributable, rather than the train operator that faces the disruption; and

(c) provide appropriate signals so as to drive the decision-making in relation to performance and possession management, for example, in relation to where to make investments, or to give an indication to Network Rail on whether it is better

to have a short possession but with higher engineering costs or take a longer possession.

20.3 In their role as compensation mechanisms, Schedules 4 and 8 ensure that train operators are less exposed to risk that they cannot control than they would otherwise be. In the case of franchised passenger train operators, this helps reduce the risk premiums factored into franchise bids. This ultimately feeds through to taxpayers through lower franchise costs, and passengers through downward pressure on fares.

20.4 Exposing Network Rail to the impact of its possessions management and performance on long term fare revenue means it is more likely to be incentivised to act in the interests of passengers, for example, by investing in improving the performance of services that more passengers use.

20.5 Schedules 4 and 8 are liquidated sums regimes, which means that compensation payment rates are determined in advance using a set formula, rather than negotiated individually once an event has occurred. This is a common feature of contracts and is a way of minimising legal and administrative costs.

Current compensation arrangements

Schedule 8

20.6 Schedule 8 provides train operators with compensation for unplanned service disruption caused by Network Rail and other train operators. Schedule 8 is one of a range of factors that encourage Network Rail and train operators to continuously improve performance.

20.7 Track access contracts for franchised passenger, open access passenger, freight and charter operators all contain a Schedule 8.

20.8 Our view is that, overall, Schedule 8 works well. For CP5 we will therefore not be making any major alterations to the structure of the regime, but we will be making changes to some of the metrics to ensure they remain appropriate and that Schedule 8 continues to work effectively in CP5.

Schedule 8 for franchised and open access passenger operators

20.9 The regimes for franchised and open access passenger operators are very similar. They are both benchmarked regimes, where payments are made when Network Rail's

or a train operator's performance diverges from a benchmark[357] number of minutes of lateness.

20.10 There are separate benchmarks and payment rates for Network Rail and train operators. These are unique to each train operator's service groups (collections of train services).

20.11 The Network Rail payment rate sets the basis for compensation payments from Network Rail to train operators when Network Rail's performance is worse than benchmark, and bonus payments to Network Rail from train operators when Network Rail's performance is better than benchmark. It is set at a level to reflect the impact over time of performance on fare revenue. Schedule 8 is not designed to compensate passengers for poor performance. Instead this type of compensation is available to passengers through schemes such as delay repay[358], which is required under the majority of franchise agreements.

20.12 Likewise, the train operator payment rate represents the level of compensation a train operator is liable to pay to Network Rail in relation to disruption caused to third party train operators as a result of the train operator's performance being worse than the train operator benchmark. Under what is commonly referred to as the 'star model', all liabilities between operators flow through Network Rail. Network Rail pays a bonus to a train operator (payable at the same rate as compensation) if the train operator's performance is better than benchmark. Train operator payment rates are based on an estimate of the extent to which the performance of a train operator impacts on the services of other train operators, along with the impact of performance on revenue over time for those services disrupted.

20.13 Poor performance is measured in terms of lateness experienced by passengers. Specifically it is measured as the average minutes of lateness per day between the

[357] Benchmarks are known as 'performance points' in track access contracts.

[358] Under the delay repay scheme, all passengers, including holders of season tickets are entitled to claim compensation for each delay over a certain length of time, for example, 30 minutes, an hour, two hours, whatever the cause. Compensation is up to 100% of the single fare, or 100% of the return fare, depending on the length of the delay. The entitlement for season ticket holders is calculated using the proportional daily cost of the season ticket.

timetabled time at particular stations[359] and the actual time a train arrives at those particular points.

20.14 The share of responsibility for lateness is attributed between Network Rail and train operators using the TRUST delay attribution system. This identifies the causes of delays to services, i.e. the time lost between points where delay is reported[360].

20.15 For the purposes of Schedule 8, cancellations are treated as a specific number of minutes of 'deemed' lateness. This varies between service groups and reflects the frequency of services, i.e. how long passengers will have to wait for the next train, and the fact that subsequent trains become more crowded and less pleasant to travel on when cancellations occur.

20.16 Benchmarks and train operator payment rates were last updated (other than for inflation) as part of PR08. Network Rail payment rates were last updated in our 2005 review of Schedule 8[361].

20.17 Schedule 8 for franchised and open access passenger operators is designed to be financially neutral (i.e. net payments are zero) when Network Rail and train operators are performing in line with expectations[362].

20.18 Currently train operators may claim additional compensation from Network Rail for sustained poor performance, if performance is worse than a defined threshold over time, provided they can demonstrate the liquidated sums element of Schedule 8 is not providing adequate compensation.

Schedule 8 for freight operators

20.19 The freight Schedule 8 performance regime was comprehensively reviewed and updated in PR08, with the creation of a standardised regime across all freight operators so as to remove any competitive advantage to particular operators, for

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[359] These stations are known as monitoring points.

[360] The primary purpose of the TRUST system is to help ensure the industry is able to fix the underlying problems that cause delays so performance can improve over time. Rather than collect separate data for Schedule 8 to attribute lateness, Schedule 8 relies on data already collected for the TRUST system.

[361] http://www.rail-reg.gov.uk/server/show/nav.177

[362] Network Rail has made net Schedule 8 payments to train operators during CP4. This is largely due to Network Rail performing below expectations (the net payment is also affected to a lesser extent by train operator performance). In 2011-12, Network Rail made a net Schedule 8 payment of £80m (2011-12 prices).

example through having a different payment rate to other operators running a similar service. The regime was also simplified considerably.

20.20 The nature of the standardised freight Schedule 8 is that benchmarks and payment rates are common across all freight operators. We are of the view the standardised regime works well and this view is shared by the majority of stakeholders.

20.21 Freight Schedule 8 benchmarks are based on minutes of delay per 100 miles, rather than average minutes of lateness, used in Schedule 8 for passenger operators. Because they are normalised for distance operated, the freight Schedule 8 benchmarks are suitable for all sizes of operator.

20.22 Most of the freight Schedule 8 is designed to be financially neutral at benchmark performance. However, there is no benchmark for cancellations. Instead freight operators receive compensation for all cancellations caused by Network Rail or other train operators. Network Rail receives funding to cover the expected number of cancellations for the control period.

20.23 Certain elements of the freight Schedule 8 are designed to reduce the exposure of freight operators to financial risk. These are:

(a) an option available to each freight operator to pay an access charge supplement (ACS) for a cap on the amount it is required to pay in relation to a single incident; and

(b) reciprocal caps on the maximum annual Schedule 8 liability freight operators and Network Rail can face in relation to a particular track access contract. These are usually agreed by Network Rail and freight operators, and approved by us.

Schedule 8 for charter operators

20.24 There is a different Schedule 8 arrangement for charter operators to reflect the fact that charter services (generally trains used for leisure purposes) do not carry passengers at ordinary fares and the revenue implications of disruption are complex.

20.25 Like freight, the Schedule 8 regime for charter operators is also a standardised regime. Payment rates are common across all charter operators, and the Network Rail payment rate is the same as the Network Rail payment rate for freight operators.

20.26 There are currently no Schedule 8 benchmarks within the charter operator regime. Charter operators make compensation payments in respect of all delays they cause to

other operators of 3 or more minutes; Network Rail compensates charter operators for all delays of 3 or more minutes caused by Network Rail or other operators. For CP5, we plan to introduce benchmarks into Schedule 8 for charter operators to bring it in line with the passenger and freight Schedule 8 regimes. More detail on this is provided on paragraphs 20.145-20.146 below.

20.27 Incident caps limit the amount of compensation per incident paid by charter operators to Network Rail under the Schedule 8 regime to £5,524. The same incident cap applies to compensation paid by Network Rail to charter operators, although this has rarely been employed in practice. Charter operators do not currently pay an ACS in exchange for the benefit of incident caps.

Schedule 4 possessions regime

20.28 The Schedule 4 possessions regime is designed to compensate train operators for the financial impact of planned possessions where operators are given restricted access to the network, principally as a result of Network Rail undertaking engineering work.

20.29 The possession regimes for passenger and freight operators are different. Both regimes were significantly overhauled as part of PR08. The key features of each are explained below. There is no Schedule 4 regime for charter operators.

Schedule 4 for franchised passenger operators

20.30 This compensates franchised passenger operators for service disruption due to planned possessions. In return for this compensation passenger operators pay a pre-determined ACS to cover the estimated efficient cost to Network Rail of the Schedule 4 regime. This reflects the fact that Network Rail is expected to require a certain number of possessions and can be seen as analogous to the performance benchmark in Schedule 8.

20.31 Compensation payments are paid by Network Rail to franchised passenger operators on a formulaic basis. Schedule 4 payments are to compensate for a combination of the following:

(a) the effect of possessions on fare revenue;

(b) additional costs incurred when running replacement buses; and

(c) costs or cost savings from a change in train mileage.

20.32 We are not making major changes to the regime as part of this periodic review, but there are a number of aspects we have reviewed in order to improve the incentives for Network Rail to plan possessions effectively and efficiently and to reduce the impact of possession disruption on passengers. The main issues where we are proposing changes are in relation to replacement bus cost compensation and the level of compensation payable to operators where Network Rail makes late cancellation of or amendments to Type 1 possessions.

The effect of possessions on fare revenue

20.33 Network Rail compensates franchised passenger operators for revenue losses as a result of passengers being deterred from travelling due to possessions disruption. Compensation is based on Schedule 8 payment rates. Network Rail is entitled to reduce the amount of compensation it pays, depending on how early it notifies passenger operators about possessions. The discount reflects the reduced impact on train operators' revenues where passengers receive early notice of service disruption[363]. The amount of discount is determined by notification discount factors which vary according to the amount of notification given to passenger operators, and the type of service that is being disrupted.

Additional costs incurred when running replacement buses

20.34 Franchised passenger operators can claim compensation for the costs of running replacement bus services when train services are cancelled due to disruption caused by possessions. Compensation is determined by formula; the amount of compensation received is the product of estimated bus miles (EBMs), which is the distance in miles between transfer points (e.g. between stations), and the EBM payment rate which is paid in £ per EBM operated. EBM rates are paid at two rates, one for London & South East services and one for services operating in the rest of the country.

Costs or cost savings resulting from a change in train mileage

20.35 Franchised passenger operators may make cost savings or incur additional costs as a result of changes in train mileage operated due to possessions, depending on the

[363] While with earlier notice of possessions passengers may be more likely to make alternative travel arrangements, they are less likely to be put off from travelling by train in the future if amended timetables do not take them by surprise.

actual pattern of cancellations or diversions. The costs or savings are determined by a payment rate per train mile, as set out in track access contracts.

Schedule 4 for open access passenger operators

20.36 Open access passenger operators may opt to pay an ACS if they want to receive full formulaic Schedule 4 compensation, consistent with that available to franchised passenger operators. Currently no passenger open access operators do this, and therefore they only receive compensation for very long possessions[364] or sustained disruption.

Schedule 4 for freight operators

20.37 The Schedule 4 freight regime is structured so that there are three levels of compensation depending on the degree of disruption (with the possibility of compensation for actual losses for severe disruption) and higher payments made for late notice possessions. Freight operators do not pay an ACS to cover the expected costs of Schedule 4 compensation, and as a result only receive compensation for significant planned disruption notified before T-12[365].

Our determination

20.38 We set out below the changes we are making to Schedules 4 and 8. Some of these changes are updates to the metrics of the regimes, such as payment rates and benchmarks, as a result of new evidence. Others are policy changes, such as the introduction of compensation to passenger train operators for late notice cancellations of possessions.

20.39 In particular we are improving the compensation and incentive properties of Schedules 4 and 8 to improve outcomes for passengers, end-users and taxpayers. We are doing this by:

(a) updating Schedule 4 and 8 payment rates so they reflect the best available evidence of the impact of possessions and poor performance on long term revenue and costs;

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[364] These possessions are classified as Type 2 and Type 3 possessions, defined as: type 2 possessions: single possession greater than 60 hours, but equal to or less than 120 hours, (excluding public holidays) type 3 possessions: single possession greater than 120 hours (including public holidays).

[365] T-12 refers to twelve weeks before a new timetable comes into operation.

(b) updating performance benchmarks in the Schedule 8 regime, including ensuring Network Rail's performance benchmarks reflect the output targets we set for CP5; and

(c) improving other aspects of Schedules 4 and 8 to make sure they function effectively, do not result in perverse incentives, and work overall in the best interests of passengers, freight customers and taxpayers.

20.40 Some of the work relating to Schedule 8 payment rates and benchmarks is still on-going. In these instances we outline the progress we have made so far and our planned next steps.

20.41 In reaching our proposed decisions we have:

(a) consulted on Schedules 4 and 8 at a high level in our May 2011 document and December 2011 consultation on incentives;

(b) consulted specifically on Schedules 4 and 8 in our November 2012 consultation on the possession and performance regimes;

(c) set up industry groups in relation to the passenger and freight Schedules 4 and 8, which have provided technical advice and helped inform policy proposals; and

(d) commissioned external work to help inform our decisions and determine payment rates and benchmarks.

Schedule 4 and 8 compensation in relation to full impact of disruption

20.42 As part of PR13, we considered whether train operators should continue to be fully compensated for the impact of service disruption on their revenue and costs, as they are currently.

20.43 The intention of setting payment rates at a level that would not fully compensate train operators for planned and unplanned service disruption would be to help encourage train operators to work with Network Rail to improve performance and minimise the number and impact of possessions. Potential ways train operators could work more closely with Network Rail to minimise service disruption include greater effort from train operators in delay recovery from Network Rail incidents, and better possession planning with greater train operator involvement in ensuring disruption to passengers is minimised.

20.44 However, we were mindful that a disadvantage of capping Network Rail payment rates below 100% is that such an approach would weaken the financial incentive for Network Rail to reduce disruption to services by reducing the amount that the company would pay to train operators for poor performance or disruption. We commissioned Steer Davies Gleave (SDG) to carry out research to establish whether it is appropriate to set payment rates to below 100% of the financial impact of disruption, including whether the economic benefits of doing so would outweigh the costs.

20.45 We have decided to set Schedule 4 and 8 payment rates so that they continue to compensate train operators for the full financial impact of service disruption due to Network Rail and other operators, where this is currently the case[366]. This is for the following reasons:

(a) SDG reported that interviews with, and quantitative analysis it carried out using evidence from, train operators suggested that setting Schedule 4 and/or Schedule 8 rates to 25% below full compensation would be unlikely to change behaviour;

(b) setting Schedule 4 and 8 rates at 25% below full compensation was estimated by SDG to significantly increase the risk premium factor in franchise bids and result in additional costs for freight operators from being exposed to risks from Network Rail's performance that the operators are unable to control;

(c) Schedule 4 and 8 payments incorporated within the REBS mechanism, as we propose will be the case in CP5 (see chapter 19), are more likely to result in constructive engagement between Network Rail and train operators in the interests of passengers and taxpayers; and

(d) rates that compensate train operators for the full financial impact of service disruption were supported by all parties who responded to our consultation (including Network Rail, passenger and freight operators).

20.46 We also considered the effectiveness of Schedules 4 and 8 during extreme disruption, such as severe weather, including a proposal from Network Rail to introduce a 'Joint

[366] Elements of Schedules 4 and 8 that require funding, such as the freight Schedule 4 and payments for Network Rail cancellations under the freight Schedule 8, do not necessarily provide full compensation.

Restrictions of Use' concept into Schedule 4, where under particular 'trigger' scenarios Network Rail and train operators could agree a joint Restriction of Use. In these scenarios Network Rail would pay a lower amount of compensation and would not pay compensation in relation to estimated bus mileage where the use of buses is also not possible, due to the same adverse weather conditions. The aim of this would be to prevent situations where neither party is able to run a full timetable, but neither party wishes to be the first to declare this, in order to avoid incurring Schedule 4 costs, or avoiding Schedule 4 compensation payments.

20.47 We will not be incorporating Network Rail's proposed joint Restrictions of Use concept into Schedule 4 of our model track access contracts. Our view is that in most parts of the network the current wording of Schedules 4 and 8 is not preventing Network Rail and train operators from working together in the interests of passengers during extreme disruption, and that in any localised circumstances where the current contractual wording is not felt to work well, it would be more effective for Network Rail and train operators to propose bespoke arrangements to us.

20.48 The other changes we are proposing relate specifically to Schedule 4 or 8. We set these out below.

Schedule 8 performance regime

Passenger performance regime

20.49 The Schedule 8 performance regime for passenger operators was last updated as part of PR08, but there are elements, such as Schedule 8 payment rates, that were last reviewed in our 2005 performance review.

20.50 As part of PR13, ORR and Network Rail commissioned Halcrow to update Schedule 8 payment rates and benchmarks so they reflect the most up to date evidence. An element of this work includes Halcrow engaging with train operators and Network Rail to validate its calculations.

20.51 We set out below the changes we have determined in relation to the Schedule 8 passenger performance regime.

Network Rail benchmark

20.52 Since Schedule 8 is intended to be financially neutral in aggregate, benchmarks should therefore be set at a level that is challenging but realistically achievable, and consistent with the performance levels Network Rail is funded to achieve.

20.53 We are updating the Network Rail benchmarks to take account of:

(a) actual performance between the beginning of April 2010 and the end of March 2012 (the recalibration period);

(b) committed performance by Network Rail to train operators between the end of the above period and 1st April 2014, contained in the Join Performance Improvement Plans (JPIP)s; and

(c) performance trajectories for CP5. These are to ensure the CP5 benchmarks reflect a level of performance which Network Rail can deliver in respect of each train operator, while at the same meeting the performance targets we have set at an aggregate level.

20.54 The recalibration period was chosen on the basis of the following:

(a) it is desirable to use the most recent data as possible as this better reflects the current network characteristics and service patterns;

(b) it is desirable to use time periods that relate to Network Rail's financial years so improvement trajectories can be applied to Network Rail's benchmarks in a way that is simple and transparent;

(c) year-on-year fluctuations in performance due to external factors such as those related to the weather can have a significant impact on benchmarks. A two year period helps minimise the impact of these fluctuations while still ensuring the data is relatively recent; and

(d) due to the high volume of data required for the update of benchmarks, it would be costly to use data from a longer time period than necessary.

20.55 In August 2013, we will publish a report from Halcrow outlining its methodology for the update of Schedule 8 benchmarks. Halcrow will also provide to Network Rail the supporting data and models to aid with future operator specific re-calibrations, for example, in the event of a major timetable change.

20.56 Network Rail will then propose Schedule 8 benchmarks for each year of CP5 based on **committed performance between the end of the recalibration period and the 1 April 2014,** and **performance trajectories for CP5**, by train operator.

20.57 There will then be an opportunity for train operators to scrutinise the Network Rail benchmarks relating to their service groups, before our final approval. As part of our process for approving the final Network Rail benchmarks, we will make sure they are consistent with the aggregate performance targets we set for CP5 in chapter 3.

20.58 Network Rail recently consulted on the principles it will apply when calculating Schedule 8 benchmarks for each year of CP5[367]. It is working on a revised proposal in light of the consultation responses. We will make a final decision on the principles Network Rail should follow in July 2013.

20.59 Table 20.1 contains a high level timetable for the remainder of this process. The timings reflect the fact that Network Rail needs to have seen the output targets we set in this draft determination before it can carry out a large part of the work to calculate Schedule 8 benchmarks for each year of CP5.

Table 20.1: High level process for finalising Schedule 8 benchmarks

Date	Activity
July 2013	ORR confirms Schedule 8 benchmark principles
May – July 2013	Network Rail routes develop train operator level PPM trajectories, which are consistent with our draft determination
June 2013 - August 2013	Network Rail carries out the technical work to enable it to convert train operator-level PPM trajectories into Schedule 8 benchmarks
August 2013	Network Rail consults on CP5 Schedule 8 benchmarks, which are consistent with our draft determination
September 2013	Network Rail submits proposed Schedule 8 benchmarks to ORR
31 October 2013	We finalise Schedule 8 benchmarks, as part of our final determination

[367] http://www.networkrail.co.uk/publications/delivery-plans/control-period-5/periodic-review-2013/pr13-closed-consultations/.

Network Rail payment rate

20.60 As discussed above, the Network Rail payment rate is designed to reflect the impact of performance on a train operator's long term revenue. It is composed of the estimated average marginal revenue effect (MRE) per passenger journey within a service group multiplied by the number of passenger journeys per day in that service group. The MRE represents the impact of a minute's lateness on fare revenue over time.

20.61 The MRE calculation is based on the following:

(a) estimating the amount of revenue at stake in each service group, using ticket sales data from LENNON[368] and other data sources such as those relating to multi-modal ticketing systems, during a one year period running from April 2011 to the end of March 2012[369]; and

(b) combining this with the best available estimates from the Passenger Demand Forecasting Handbook (PDFH) on:

(i) how passenger demand responds to percentage changes in journey time (GJT[370] elasticities); and

(ii) how much passengers value lateness compared to scheduled journey time (late time multiplier).

20.62 The PDFH is the recognised industry guidance on forecasting the impact of various factors on the demand for passenger services. It has recently been updated. The bulk of this work was commissioned by the Passenger Demand Forecasting Council, with ORR and Network Rail making a contribution towards the update of late time multipliers. The work was overseen by the Passenger Demand Forecasting Executive steering group, members of which include train operators, Network Rail, ATOC, DfT

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[368] LENNON is the rail industry's central ticketing system, operated by ATOC. It includes information on national rail tickets purchased in Great Britain.

[369] Unlike the recalibration period for benchmarks, this is a one year period. This is because, while revenue is influenced by performance, it tends not to fluctuate as much because the impact is not immediate. Also, given the impact of performance on revenue is not immediate, performance in 2011-12 is likely to have been influenced by both of the years used for the recalibration of benchmarks. We therefore did not consider it cost effective to use revenue data from a two year period for the update of payment rates.

[370] Generalised journey time.

and ORR. DfT has not yet taken a view on the new PDFH guidance and will be conducting a thorough review of the updated evidence in the PDFH to help it decide whether to include it in its transport appraisal guidance (WebTAG). This review will not be completed in time for us to factor it into our final determination.

20.63 On the basis of the process followed and our involvement in it, our opinion is that the updated PDFH parameters are more robust than the previous ones. To ensure Schedule 8 is based on the best and most up to date available evidence, except where we have a clear rationale for doing otherwise, we will calculate the final CP5 Schedule 8 payment rates so they are based on the GJT elasticities and late time multipliers that feature in the updated edition of the PDFH.

20.64 Schedule 8 Network Rail payment rates feed into several calculations, such as the Schedule 4 ACS and the capacity charge. In order to provide draft Network Rail payment rates on time for the draft determination and draft capacity charge price lists, we commissioned Halcrow to calculate draft Schedule 8 payment rates based on the most recent draft GJT elasticities and late time multipliers proposed for inclusion in the updated PDFH. Details on our decision in relation to the capacity charge are contained in chapter 16 on access charges.

20.65 Since these calculations were carried out, PDFH values have been finalised but with a minor adjustment to the late time multiplier for London & South East commuter passengers, to 2.5 instead of 3.0 or 3.9 (depending on journey length). For this reason calculations based on draft Schedule 8 payment rates, for example, the Schedule 4 ACS, are likely to be higher in some instances than when they are recalculated using the final Schedule 8 payment rates.

20.66 In addition to this, Network Rail has recently raised concerns regarding the established methodology used to convert revenue, GJT elasticities and late time multipliers into Schedule 8 payment rates for London & South East commuter services. It argues that the established approach results in Schedule 8 rates that are much higher than the actual impact of performance on revenue and suggests this could be due in part to:

(a) capacity constraints, such as crowding suppressing demand growth, even on well-performing services; and

(b) the amount of time it takes for changes in punctuality to result in changes in demand for this type of service.

20.67 As a result, Network Rail consulted with the industry outlining these concerns and has proposed an alternative approach. This could further reduce the final Schedule 8 payment rates, depending on the outcome of Network Rail's consultation.

20.68 We fully endorse Network Rail's consultation and we see it as an important step in ensuring that the Schedule 8 payment rates we set for CP5 reflect as closely as possible the impact of poor performance on fare revenue over time.

20.69 Network Rail is currently reviewing responses to its consultation. We will make a final judgement on the methodology to be used and reflect this in our calculation of final Schedule 8 payment rates.

20.70 We have also given Network Rail and train operators the opportunity to agree alternative Network Rail payment rates in instances where they are both of the view that the default methodology is likely to result in Schedule 8 payment rates that are not a realistic reflection of the impact of performance on revenue for a particular service group. Any such proposals should be submitted to us by 17 July 2013 and will be subject to our approval. Our final date for approving local revisions to Schedule 8 payment rates will be 7 August 2013. At this point all the Schedule 8 Network Rail payment rates will be final.

20.71 Table 20.2 contains a high level timetable of the process for finalising Schedule 8 payment rate calculations.

Table 20.2: High level timetable of the process for finalising Schedule 8 payment rate calculations

Activity	Date
Network Rail launches consultation, outlining its concerns and its view on the inputs that should be used to calculate Schedule 8 payment rates for London & South East commuter services	15 May 2013
Network Rail's consultation closes	11 June 2013
Network Rail concludes on consultation	26 June 2013
We decide on inputs that should be used in calculating the Schedule 8 payment rates	10 July 2013

Activity	Date
Deadline for Network Rail and train operators to jointly propose local revisions to Schedule 8 payment rates	17 July 2013
Halcrow calculations of Schedule 8 payment rates complete	31 July 2013
We approve local revisions to Schedule 8 payment rates. After this point all Schedule 8 Network Rail payment rates will be final	7 August 2013

20.72 In general, Schedule 8 payment rates will increase considerably, due to:

(a) increases in passenger numbers, meaning there is more fare revenue at stake;

(b) updates to the PDFH evidence on how passenger demand responds to increases in journey time; and

(c) above inflation increases in fares on some services.

20.73 This increase will help strengthen the incentives on Network Rail to improve its performance and prioritise its investments where there is the most passenger revenue at stake. Setting Schedule 8 payment rates at the right level will also have the benefit of ensuring train operators receive appropriate compensation for disruption to their services caused by Network Rail and third parties. This should reduce the risk train operators are exposed to that they cannot control, which should ultimately reduce the risk premiums factored into future franchise bids.

Train operator benchmark

20.74 Train operator benchmarks should also be set at a challenging but realistically achievable level. For CP5, we are updating train operator benchmarks to reflect actual performance between the beginning of April 2010 and the end of March 2012, as part of the Schedule 8 recalibration work we and Network Rail have commissioned from Halcrow.

20.75 The performance of franchised train operators is regulated by the franchising authorities[371]. We are of the view that train operators already face significant financial incentives to perform well through franchise agreements and exposure to fare revenue. We will not be setting performance trajectories for train operators in

[371] DfT and Transport Scotland. Similarly, Merseytravel and TfL regulate the performance of those train operators with whom they have a concession agreement (which is similar to a franchise agreement).

Schedule 8 as we are not of the view this would materially enhance the incentives which the train operators already face, i.e. train operator benchmarks will be set on the basis of performance during the two year recalibration period.

Train operator payment rate

20.76 Although the train operator payment rate reflects the impact of the performance of a train operator on other train operators, payments between train operators are channelled through Network Rail in order to reduce the overall number of transactions.

20.77 The work we and Network Rail have commissioned from Halcrow to update train operator payment rates reflects the following:

(a) the updated Network Rail payment rates, as these reflect the best available evidence of the impact of performance on long term revenue; and

(b) the latest pattern of impacts of each train operator's performance on other train operators (where much more detailed data is now available than in PR08).

20.78 In our November 2012 consultation we consulted on a number of policy issues, relating to Schedule 8. Our decisions in relation to these issues are set out below.

Additional compensation for sustained poor performance

20.79 Under Schedule 8, additional compensation may be claimed when Network Rail's performance in relation to a specific train operator's services is worse than the Sustained Poor Performance (SPP) threshold, providing the train operator can show that it has not been adequately compensated through the liquidated sums element of Schedule 8. Our intention is that the SPP threshold should enable additional compensation to be claimed for sustained poor performance where compensation under the standard Schedule 8 arrangements is likely to be materially less than what is needed to reflect the actual impact of poor performance on the train operator.

20.80 The SPP threshold was established in our 2005 passenger performance regime review. Table 20.3 shows what levels the SPP threshold has been set at since it was introduced:

Table 20.3: SPP thresholds in previous years

Year	SPP threshold
2006-07	25% worse than benchmark performance over at least 12 months
2007-08	22.5% worse than benchmark performance over at least 12 months
2008-09	20% worse than benchmark performance over at least 12 months
2009-14	10% worse than benchmark performance over at least 12 months

20.81 In our November 2012 consultation we stated that we consider train operators should be protected from the financial impacts of sustained poor performance by Network Rail; and that we are also of the view that a key strength of Schedule 8 is its liquidated sums nature, which is simpler and less costly to administer than a bespoke claims process. We proposed that we should increase the SPP threshold, and asked for suggestions from consultees on the level at which we should set it.

20.82 We received a mixed response from stakeholders. Network Rail was strongly in favour of increasing the SPP threshold, and commissioned some research from Steer Davies Gleave (SDG), which it submitted as part of its consultation response, which recommended it should be set at 30%. ATOC and train operators argued strongly that the 10% threshold remains appropriate.

20.83 We have decided to continue to set the SPP threshold at 10% of the Schedule 8 benchmark for CP5, on the basis that the small number of claims made in CP4 does not indicate that in practice an SPP threshold of 10% is undermining the liquidated sums nature of Schedule 8. Given the legal and administrative costs to a train operator of making a claim, we anticipate that SPP claims are in general only made when losses incurred are materially greater than the formulaic Schedule 8 compensation received.

20.84 The analysis presented by SDG suggests that even if Network Rail were performing at its benchmarks on average during 2011-12, an estimated 47% to 68% of train operators would be eligible to claim additional compensation for SPP[372]. With the SPP

[372] These two estimates are based on analysis that assumes that (i) performance in 2011/12 was better by fixed percentage across service groups or (ii) the SPP threshold is set at an average performance over the previous two years, respectively. The former assumes variability of performance between train

threshold set at 30% which the SDG analysis recommends, an estimated 5% of train operators would be eligible to claim additional compensation for SPP. This analysis assumes continuation of the current variability In Network Rail's performance, either across train operators, or in relation to a specific train operator over time.

20.85 While at face value the evidence presented by Steer Davies Gleave suggests that the 10% threshold might be too low, we are not convinced that the evidence presented by the Steer Davies Gleave work provides a compelling enough case on its own for the SPP threshold to be increased. At a time when Network Rail has continued to not meet its performance targets, we are of the view we would be sending the wrong message to Network Rail if we were to increase the SPP threshold.

20.86 Given the low number of claims during CP4 despite Network Rail not meeting its performance targets, and the fact the CP5 Schedule 8 payment rates will be based on the best available up to date evidence on the impact of performance on revenue, we do not anticipate that setting the threshold at 10% will result in a large number of claims if Network Rail performs at benchmark in aggregate. But at the same time, maintaining the 10% threshold will ensure the option remains available to train operators to claim additional compensation in the event relevant losses are not adequately compensated for by the liquidated sums element of Schedule 8.

Compensation for Passenger Charter payments

20.87 Currently a small number of train operators opt to pay an ACS in order to receive compensation to cover season ticket discounts to passengers in accordance with Passenger Charter regimes within their franchise agreements. Net payments within the Passenger Charter element of Schedule 8 are now very small and for the first three years of CP4, Network Rail has received significantly more in ACS for Passenger Charter compensation than it has paid out under Schedule 8.

20.88 This element of Schedule 8 is not operating as it originally intended, nor is it cost effective to update the payment rates relating to make it function more effectively. We therefore will remove this element of Schedule 8.

20.89 Despite the imbalance in payments it is possible that some of the train operators that opt into the Passenger Charter element of Schedule 8 view it as catastrophe

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operators remains the same. The latter assumes fluctuations of Network Rail's performance over time in relation to specific train operators remain the same.

insurance to protect them if there are significant declines in Network Rail's performance. Those passenger operators would be free to agree bespoke arrangements with Network Rail as part of their track access contracts, subject to approval by us, or seek insurance from the private market.

Other issues

20.90 There are some other issues we consulted on in November 2012 in relation to which we will not be making changes. These are as follows:

(a) **whether to introduce a time delay on Schedule 8 payments.** Ideally Schedule 8 payments should reflect the impact of performance on train operators' revenues over the long term. However, Schedule 8 payments are made within 35 days of the preceding four-week period. After reviewing the evidence we are not of the view the benefits of introducing a time delay on Schedule 8 payments are material enough to justify the additional complexity and administrative burden it would result in. This view is reflected in the responses we received from stakeholders;

(b) **whether paragraph 17 of Schedule 8 should be amended to reduce the number of circumstances in which train operators may request changes in payment rates**. Paragraph 17 of Schedule 8 allows Network Rail or train operators to propose changes to metrics in Appendix 1 of Schedule 8, such as payment rates and benchmarks, mid-control period. Network Rail has proposed that the use of paragraph 17 of Schedule 8 to change Network Rail payment rates should be restricted to situations where there are major timetable changes. We will not be introducing this restriction. Our view is that there could be legitimate reasons for Network Rail or train operators to propose changes to Appendix 1 mid-control period, other than a timetable change, including those that are not foreseeable during PR13; and

(c) **treatment of cancellations by train operators to their own trains.** Currently the way in which the definitions and formulae in Schedule 8 work means that when a train operator cancels one of its own trains, it has an impact on its Schedule 8 payments even when it does not cause delay to the services of other train operators. We consulted on whether it would be worth changing this element of Schedule 8, when weighed against the costs of doing so. Responses from stakeholders suggest it is a small issue that is not having any particular

impact on behaviour and that a change is unlikely to justify its cost. We therefore do not propose introducing a change for CP5. However, we recommend that at the next substantive update of Network Rail's PEARS system, which translates delay attribution data into Schedule 8 payments, Network Rail considers the merits of including within PEARS the capability of allowing a change to be made to the treatment of cancellations by train operators to their own trains.

20.91 There are also a few minor drafting improvements that have been identified by stakeholders. We will include these in the revised drafting of the template track access contracts, on which we will consult on 12 July 2013.

Freight performance regime

Network Rail benchmark

20.92 As with the passenger Schedule 8, we will be setting the Network Rail benchmark at a level that is challenging but realistically achievable and consistent with the performance levels for which Network Rail is funded.

20.93 During CP4 both the regulated target for Network Rail freight performance and the benchmark in the freight performance regime were based on delay minutes per distance operated. Hence they were very closely correlated. In our November 2012 consultation we said we would set the benchmark to reflect the performance targets we set for Network Rail in CP5. Since producing that document, we have decided that the Network Rail performance target in relation to freight services will be expressed in terms of the new Freight Delivery Metric (FDM) which measures the percentage of freight trains arriving at their destination within 15 minutes of scheduled time. It only covers delay or cancellation caused by Network Rail. Further detail on the FDM is contained in chapter 3.

20.94 We do not consider that it would be robust to determine the Network Rail benchmark on the basis of this target, given it is based on an entirely new metric and differs slightly in purpose from the previous delay minute target. It conflates cancellations with delay, whereas cancellations are treated separately in the performance regime. Overall we expect Network Rail to perform throughout CP5 at a level equal to the delay minute target of 2.94 delay minutes per 100 train km we set for the final year of CP4. This matches the internal route level delay minute target Network Rail referred to in its SBP.

20.95 Network Rail has argued that the methodology that we applied to produce the CP4 Network Rail benchmark for the new standardised regime did not take into account the fact that the delay minute target set for CP4 was based on delays caused by Network Rail captured in TRUST, and that this does not correspond exactly to the way Network Rail delay is defined when calculating Schedule 8 payments. Network Rail has proposed an adjustment to reflect this.

20.96 In order to ensure the Network Rail benchmark is consistent with the target for the final year of CP4 of 2.94 delay minutes per 100 train km, we have factored the following into our calculation of the draft Network Rail benchmark:

(a) delay caused by other train operators, which is classified as Network Rail delay under Schedule 8 (this was also factored into the Network Rail benchmark calculation for CP4);

(b) delay agreed to be caused by Network Rail as part of the Post Day 8 resolution process[373], but which is still shown as freight operator-caused in TRUST due to it not being agreed until after the TRUST data is finalised (as per Network Rail's proposal);

(c) delay agreed to be Network Rail-caused due to commercial agreements, for example in relation to delay attribution when there is leaf fall, but recorded as freight operator-caused in TRUST (as per Network Rail's proposal); and

(d) delay agreed as service variation minutes[374] under the Management of Freight Services During Disruption (MFSDD) process[375]. During CP4 an increasing proportion of delays to freight services have been classified as service variation minutes and therefore not captured in TRUST, when they previously would have been. The adjustment we apply to the CP5 benchmark should reflect the

[373] It is only possible to make detailed changes to individual records within the TRUST system up to 8 days after an incident. However there will be some incidents, such as where detailed investigation is needed into its cause, e.g. an electrification dewirement, where the final responsibility is not established until after this point. In addition there may be a negotiated agreement to split delay minutes in a particular way on days when there has been severe disruption due to seasonal factors.

[374] A service variation is when a service is re-scheduled at very short notice at the request of Network Rail.

[375] When an incident is in progress and likely to continue, freight trains that have timetable slots through the area may be given new schedules that reflect diversion or being held back in the interests of avoiding wider disruption, for example, if there are limited opportunities to regulate trains into loops along the way.

categories of delay captured by TRUST during the period on which our PR08 calculation of the end of CP4 delay minute target was based. Our adjustment therefore reflects service variation minutes in 2006/07 as a proportion of Network Rail caused delay in 2006/07, as this falls within the time period that the CP4 delay minute target was based on[376]. This differs from Network Rail's proposed adjustment which was for the adjustment to be based on service variation minutes during 2011-12. Our view is that Network Rail's proposal would result in a benchmark that is inconsistent with the delay minute target for the final year of CP4.

20.97 On the basis of information provided by Network Rail we have calculated the draft CP5 Schedule 8 Network Rail benchmark to be 6.91 minutes of delay per 100 freight operator miles[377]. We will be discussing the detail of this calculation further with industry through the freight Schedules 4 and 8 industry group, and will also be reviewing the data Network Rail has provided to ensure its accuracy.

20.98 Without taking into account this difference in definition of Network Rail caused delay in TRUST and freight Schedule 8 in our setting of the Network Rail benchmark, Network Rail would be expected to make a net payment to freight operators each year. We estimate that Network Rail would have required an average of £3m per year funding to cover the cost of this.

Network Rail payment rate

20.99 The Network Rail payment rate is the basis for compensation paid to freight operators or bonuses paid to Network Rail, when it performs below or above benchmark respectively. The payment rate should reflect the average financial impact to a freight operator of each minute of delay to a freight train attributable to Network Rail, and is the same for all freight operators.

20.100 Initial analysis that we have carried out based on previous ORR research[378] (consulted on as part of the 2010 review of access policy) suggests that the payment

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[376] Known then as 'hidden delay'

[377] Freight Schedule 8 benchmarks are in miles, whereas our delay minute targets are in km.

[378] *Rail Freight User Values of Time & Reliability: Final Report,* AECOM and University of Leeds Institute for Transport Studies, available from http://webarchive.nationalarchives.gov.uk/20111108204718/http:/www.rail-reg.gov.uk/server/show/nav.2254

rate may currently over-compensate freight operators for delays to their services caused by Network Rail. However, there is uncertainty over the robustness of the some of the evidence in the analysis, and consequently resulting estimates for the payment rate cover a wide range of £3.00 to £25.00 (2012-13 prices). The current payment rate is towards the upper end of this range. Our research estimates that costs to freight operators as a result of one minute of delay make up £3.00 to £4.20 of the total range, with the remainder due to revenue effects. Given this range the new evidence does not help us reach a specific payment rate and is not judged significantly stronger than evidence provided previously by freight operators as the basis for the current rate.

20.101 Therefore we have decided to keep the Network Rail payment rate the same but uplift it for inflation. The Network Rail payment rate will be £19.13 per minute (2012-13 prices). The Network Rail payment rate will be uplifted for inflation in each year of CP5, as has been the case for CP4.

20.102 Given the uncertainty around the correct payment rate to use, we propose re-examining the evidence base with the freight industry and Network Rail early in CP5 in order to develop a more transparent, evidence based payment rate for CP6.

20.103 Freight operators have also suggested that the Network Rail payment rate should be uplifted using the level of tonne miles on the network. We have not followed this approach as it is not clear doing so would adjust accurately for the size of impact of delays on the long term revenue of freight operators, evidence for which is sparse.

Network Rail cancellation payments

20.104 Network Rail cancellation payments compensate freight operators for the financial impact of each freight train cancellation attributable to Network Rail. If cancellations exceed a threshold representing the historic normal number of cancellations, a higher cancellation payment applies. We will continue to set this cancellation threshold at 0.41% of services scheduled. Unlike the Network Rail payment rate, cancellation payments are not part of the benchmarked regime. In CP4, Network Rail was funded for this part of the regime and it will continue to be funded for this aspect in CP5.

20.105 Our previous research used to establish an appropriate freight Schedule 8 Network Rail payment rate also provided limited evidence regarding an appropriate level for Network Rail cancellation payments. Further empirical work would be required to

determine cancellation payments that fully reflect cost and revenue impacts on operators due to freight train cancellations attributable to Network Rail.

20.106 For CP5, the Network Rail cancellation payment rates will remain the same but uplifted for inflation. In 2012-13 prices the below threshold cancellation payment will be £1,813 and the above threshold cancellation payment will be £4,835. These cancellation payments imply a Network Rail funding requirement of £20.1m in CP5 (in 2012-13 prices). This is shown in Table 22.4.

Table 20.4: Our determination of Network Rail's funding requirement to cover the expected costs of Network Rail cancellation payments to freight operators

£m 2012-13 prices	CP4	CP5					CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Great Britain	3.6	3.8	3.9	4.0	4.2	4.3	20.1
England & Wales	3.3	3.4	3.5	3.7	3.8	3.9	18.3
Scotland	0.3	0.3	0.4	0.4	0.4	0.4	1.8

Note: Numbers may not reconcile due to rounding.

Freight operator benchmark

20.107 As with the Network Rail benchmark we have set the freight operator benchmark at a challenging but realistically achievable level. Our calculation of the draft freight operator benchmark is 2.37 minutes of delay per 100 freight operator miles for the beginning of CP5. This is based on actual delay caused by freight operators to third parties during a two year recalibration period from the beginning of April 2010 to the end of March 2012, adjusted for traffic growth[379]. The recalibration period is consistent with that used to update passenger train operator benchmarks. Our reasons for choosing this period are outlined in paragraph 20.54.

20.108 In response to our November 2012 consultation, freight operators have argued that we should set the freight operator benchmark at the same level as in CP4 to encourage and reward long term investment.

[379] Actual traffic growth to 2012-13, forecast traffic growth from this point to the beginning of CP5.

20.109 While we acknowledge that ORR updating the freight Schedule 8 benchmark every five years could have some dampening effect on the returns larger freight companies receive on investments to improve performance, we have decided to set the benchmark based on performance during CP4 for the following reasons:

(a) it is consistent with our approach for updating franchised and open access passenger operator Schedule 8 benchmarks;

(b) it ensures this element of Schedule 8 remains financially neutral, providing freight operators continue to perform at the level they did during the two year calibration period. If we were to set the freight Schedule 8 benchmark at the same level it was set for the first year of CP4, but adjusted for traffic growth, we estimate that Network Rail would require an average of £7.3m additional funding per year to cover the expected level Schedule 8 bonus payments to freight operators; and

(c) Schedule 8 payments are not the only driver of investment by freight operators to improve performance and freight operators are still able to benefit from Schedule 8 payments arising from improvements they make to their performance between when the improvement is made and when it is reflected in the next update of the freight operator benchmark.

20.110 Our view is that updating the freight operator benchmark every five years at periodic review achieves the right balance between maintaining the financial neutrality of the delay minute element of the freight Schedule 8 and incentivising investment to improve performance.

Adjustment to reflect congestion on network

20.111 During CP4, if overall traffic growth on the network was above (or if traffic reduction was below) 2.5%, an adjustment was made to the freight operator benchmark.

20.112 The formula adjusting the freight operator benchmark when the materiality threshold is exceeded is as follows:

Adjusted freight operator benchmark = Current train operator benchmark x [(Traffic growth x congestion factor) + 1]

20.113 We have used this formula to adjust average delay caused by freight operators to third parties per 100 miles during the recalibration period to the freight operator benchmark for the beginning of CP5, which reflects traffic growth.

20.114 The congestion factor is designed to represent the increased extent to which freight operator delay to their own trains will result in delay to third party trains, when there is increased traffic on the network. During CP4 it was set at 1.5, which is a standard assumption often used in economic analysis relating to networks.

20.115 For CP5, we will be making two changes:

(a) updating the congestion factor to reflect work carried out by Arup on the actual impact of traffic growth on delay minutes caused by freight operators to third parties, as part of the update of the capacity charge. The industry has been given the opportunity to comment on Arup's work through the industry group. Arup's recommendation for the congestion factor is 1.044. The calculation of this relies to a large extent on the work Arup has done as part of Network Rail's work to recalibrate the capacity charge. We will review this between now and the final determination, so the congestion factor of 1.044 and, as a result, our calculation of the freight operator benchmark, should be considered as draft; and

(b) requiring Network Rail to update the freight operator benchmark every year to reflect changes in traffic levels, rather than only if a 2.5% threshold is crossed. This is something which has been suggested at the freight Schedules 4 and 8 industry group. It is a relatively straightforward calculation, and since the process of reviewing the traffic levels to determine whether the benchmark needs changing takes place each year anyway, we view it as more appropriate to update the benchmark each year instead.

20.116 If we had used the previous, assumption based, congestion factor of 1.5 to adjust the freight benchmark to reflect traffic growth, the freight operator benchmark would have been 2.41 instead of 2.37 delay minutes to third party operators per 100 miles. Since we are of the view the congestion factor of 1.044 is the most appropriate to use, we estimate that using a congestion factor of 1.5 would result in Network Rail requiring an average of £800k per year funding to cover the cost of expected bonus payments to freight operators.

Freight operator payment rate

20.117 The purpose of the freight operator payment rate is to reflect the average impact of a minute of delay caused by a freight operator to another train operator. The draft CP5 freight operator payment rate for CP5 is £51.98 (in 2012-13 prices) per minute of

delay to third party trains which is attributable to the freight operator. This is an increase from the current payment rate of £37.10 and represents an approximate 40% real terms increase in the CP4 payment rate. The increase has been driven by large increases in the Network Rail payment rates in the passenger Schedule 8, which have been partially offset by an improvement in the methodology Network Rail used in its calculation. The final freight operator payment rate for CP5 is likely to change when the passenger Schedule 8 payment rates are finalised, see paragraphs 20.60 to 20.73 for more information.

20.118 Network Rail calculated the draft freight operator payment rate by weighting the Network Rail £ per delay minute payment rates in each service group[380] by **third party freight operator delay** affecting each service group. In PR08, the freight operator payment rate was calculated using Network Rail £ per delay minute payment rates weighted by delays caused by **Network Rail and all third party train operators**. This change in methodology for CP5 therefore represents a major improvement, with the freight operator payment rate being a much better representation of the actual average financial impact on third party train operators of delays caused by **freight operators**.

Summary of CP5 benchmarks and payment rates

20.119 Table 20.5 summarises the CP5 benchmarks and payment rates. All payment rates are in 2012-13 prices.

[380] Payment rates under the Schedule 8 performance regime are based on weighted average lateness across a service group, but can be converted into £/ delay minute for the purposes of this calculation

Table 20.5: Summary of CP5 benchmarks and payment rates

	CP4	CP5	Reason for change
Network Rail benchmark	6.39 minutes delay per 100 freight operator miles, in 2013-14	6.91 minutes delay per 100 freight operator miles	Adjustment to ensure consistency with end of CP4 delay minute target
Freight operator benchmark	3.05 minutes delay per 100 freight operator miles, in 2012-13	2.37 minutes delay per 100 freight operator miles	Recalibration of freight operator benchmark to reflect delay per 100 miles caused by freight operators in 2010-11 and 2011-12, with adjustment for traffic growth
Network Rail payment rate	£19.13 per minute of delay to services which are attributable to Network Rail	£19.13 per minute of delay to services which are attributable to Network Rail	No change
Network Rail cancellation payment rate	£1,813 for each cancellation below cancellation threshold and £4,835 for each cancellation equal to or above threshold	£1,813 for each cancellation below cancellation threshold and £4,835 for each cancellation equal to or above threshold	No change
Cancellation threshold	0.41% of total number of services operated by freight operator	0.41% of total number of services operated by freight operator	No change
FOC payment rate	£37.10 per minute of delay to third party trains, attributable to the freight operator	£51.98 per minute of delay to third party trains, attributable to the freight operator	Increase due to increase in passenger Schedule 8 payment rates, partially offset by improvement in calculation methodology

Bonus payment rate

20.120 In CP4, bonus payments, paid when Network Rail or a freight operator outperforms its benchmark, are paid at rates which are 50% of the compensation payment rates. This applies to both the Network Rail payment rate and the freight operator payment rate.

20.121 In our November 2012 consultation we said that we were considering our options in relation to this, but were minded to continue to set bonus payment rates at 50% of the compensation rate. Our reason for setting the bonus payment rate at 50% in PR08 was due to concerns that a 100% bonus payment rate would represent a significant

increase compared to the previous regime, and could present a barrier to entry for small operators, or potentially make existing small operators unviable.

20.122 Responses to our consultation were in general very much against us continuing to set bonus payment rates at 50%. In CP5, bonus payment rates will be set so they are equal to compensation payment rates. This is for the following reasons:

(a) due to seasonal fluctuations in performance, even when performance is at benchmark on average throughout the year, a net payment would be made when bonus payment rates are set at 50%. We estimate that it is most likely that this net payment would be from freight operators to Network Rail. This is driven by the fact that the CP5 freight operator payment rate is considerably higher than the Network Rail payment rate; and

(b) it makes it difficult for freight operators and Network Rail to accurately incorporate Schedule 8 payments into business cases for investments to improve performance, as the magnitude of the Schedule 8 savings/ income would differ depending on whether performance is better or worse than the benchmark.

20.123 We have considered the implications on small operators and new entrants and consider the existing protection offered by incident caps and annual caps on Schedule 8 payments is adequate. We are also concerned that the expected net cost to freight operators arising from setting bonus rates at 50% would be likely to outweigh the benefits arising from freight operators not needing to pay Network Rail full bonuses for improved performance that has yet to have an impact on revenue. For CP5 we will therefore set the bonus payment rate at 100% of the compensation payment rate.

Incident cap menu

20.124 A freight operator may opt to pay Network Rail an ACS to have an incident cap on its Schedule 8 liabilities for lateness and cancellations it causes to other train operators resulting from a single incident. As a result, an incident cap protects the freight operator from the risk of significant costs arising from a particular incident. The ACS reflects the fact that performance payments to third party operators still need to be made by Network Rail even if there are no incoming payments from the freight operator because the incident cap has been reached.

20.125 In our November 2012 consultation, we questioned whether we should continue to require Network Rail to offer this protection, which is, to a large extent, insurance to freight operators in relation to incidents they cause. We stated that we were minded to remove this requirement on the basis that it is something that could in principle be provided by the private insurance market.

20.126 Responses from stakeholders expressed strong concern that this is something the private market would not be able to provide at an affordable price, particularly given that it would be a new area of cover. We have a particular concern that this could have negative consequences on smaller operators or new entrants, whose cash-flows may be more adversely impacted from a single major incident, and therefore may be more reliant on this type of insurance.

20.127 Given there are no adverse funding implications associated with us requiring Network Rail to provide this coverage, we will therefore continue to require Network Rail to offer incident caps in return for an ACS. However, between now and the final determination we are exploring with Network Rail and the industry what data it can release to enable private insurers to enter the market.

20.128 Network Rail has produced an indicative menu of incident caps and associated ACSs, as shown in Table 20.6. The ACSs have been calculated by Network Rail using a methodology that estimates the expected cost to Network Rail of providing the incident cap, using data from the beginning of April 2010 to the end of March 2012. A contingency uplift of 10% is then applied to reflect the risk incurred by Network Rail and moral hazard (operators that cause more incidents are more likely to purchase a lower cap) that arises as a result of Network Rail providing this protection.

20.129 The ACSs are higher than in CP4. This reflects the fact that the freight operator payment rate will increase for CP5 and therefore the cost to Network Rail of providing incident caps will also increase. The calculations are based on the draft freight operator payment rate, and will be updated to reflect the final freight operator payment rate in the final determination.

Table 20.6: Indicative menu of incident caps and corresponding ACSs for freight operators to choose from

Incident cap (minutes of delay per incident)	ACS (£ per mile)
1,000	0.1247
2,000	0.0567
3,000	0.0350
4,000	0.0258
5,000	0.0183
6,000	0.0125
7,000	0.0079
8,000	0.0044
9,000	0.0009
10,000	0.0008
No cap	None

Annual caps on Schedule 8 payments

20.130 Freight operators and Network Rail have reciprocal caps on the net annual liability they face under the Schedule 8 performance regime. These provide an important protection to freight operators by providing certainty about the maximum liabilities they could face.

20.131 For CP5, annual caps on Schedule 8 payments will remain specific to each freight operator as the appropriate level depends on its scale of operations. Freight operators and Network Rail will still be entitled to negotiate their own reciprocal annual caps. These caps are subject to our approval, and should be set at a level with a low likelihood of being reached. This is because once an annual liability cap has been exceeded, the incentive and compensation effects of Schedule 8 are lost.

20.132 For small freight operators and new entrants, we will continue to set a default reciprocal annual liability cap, at the same level as we set for CP4, but uplifted for inflation. We consider a small freight operator to be any operator with less than 5% market share of total freight train miles run, in a given year.

20.133 All parties wishing to have an annual liability cap in CP5 will need to submit a proposal to us. Where caps other than the default cap are proposed, these will need to have been agreed by the freight operator and Network Rail. In the event that parties disagree, we will review the submissions from both parties before making a judgement on the appropriate cap.

20.134 Since the appropriate size of an annual cap depends on the scale of operations, as in CP4, both parties will be required to update the cap at the end of the year if annual contract mileage has varied by 2.5% or more since the cap was last updated. For operators with below 5% market share, the default annual cap will remain available.

Schedule 8 for charter operators

20.135 Charter operators are currently subject to different performance arrangements compared to other passenger operators. For CP5 we plan to introduce benchmarks into the Schedule 8 for charter operators to ensure financial neutrality of the Schedule 8 regime, and bring it in line with the Schedule 8 used by other types of operator. We will also be increasing the charter operator payment rate to reflect the increase in Schedule 8 payment rates for franchise and open access passenger operators.

20.136 The introduction of Schedule 8 benchmarks sits alongside our planned introduction of a capacity charge for charter operators, which is discussed in chapter 16 on access charges. The introduction of Schedule 8 benchmarks will reduce the impact on charter operators of the increase in the charter operator payment rate. However, we expect the increase in the charter operator payment rate to increase the incentive on charter operators to minimise the disruption they cause to other services.

20.137 After careful consideration, we have also decided not to remove the £5,524 cap on the amount of Schedule 8 payment a charter operator or Network Rail has to make in respect of a single incident it causes, or require either party to pay an ACS in order to receive this cap.

20.138 We will engage with industry before making our final determination on the changes we plan to make to Schedule 8 and charges for charter operators, including in relation to their administrative viability. Network Rail has recently issued a short consultation on charter operator charges for CP5. In this document Network Rail also outlines its views on Schedule 8.

Network Rail payment rate

20.139 In CP4, the Network Rail payment rate under the Schedule 8 for charter operators was the same as the Network Rail payment rate for freight operators. Ideally there would be a separate Network Rail payment rate for charter operators to more accurately reflect the actual impact of Network Rail caused delay on charter operators' costs and revenues.

20.140 We are not aware of any evidence on the impact of delays to charter operators on long term revenue and are also mindful that it could be burdensome for charter operators if we require them to provide us with evidence on this and involve resource disproportionate to the benefit of achieving a more accurate payment rate.

20.141 For CP5, the Network Rail payment rate in the charter operator Schedule 8 regime will therefore continue to be equal to the Network Rail payment rate in the freight operator regime, at £19.13 per minute of delay in 2012-13 prices.

Charter operator payment rate

20.142 The charter operator payment rate was set equal to the Schedule 8 freight payment rate in CP4. The charter operator payment rate should reflect the average impact of a minute of delay caused by a charter operator to other train operators.

20.143 There is now data available on the delay that charter operators cause to other train operators and this data has been used to calculate a specific charter operator payment rate, using the same methodology as that used to calculate the freight operator payment rate. Specifically, the charter operator payment rate has been calculated using the Network Rail £/ delay minute payment rates for each service group weighted by the proportion of third party charter operator delay affecting each service group. This results in a charter operator payment rate that better reflects the actual impact of delays caused by charter operators to other train operators than that used during CP4.

20.144 Using this improved methodology, Network Rail has calculated a draft charter operator payment rate of £69.31 per minute of delay. This CP5 rate is almost double the CP4 charter operator payment rate that was set equal to the Schedule 8 freight payment rate. The increase has been driven by the increase in draft Schedule 8 payment rates for passenger operators. The new rate better reflects the actual impact of delays caused by charter operators to other train operators. We recognise the

potential impact this increase in the charter operator payment rate would have if we were to continue with the charter operator Schedule 8 without benchmarks. Hence, for CP5, we plan to introduce benchmarks into the charter operator Schedule 8.

Introduction of benchmarks

20.145 The aim of introducing benchmarks into the charter operator Schedule 8 is to ensure financial neutrality of the Schedule 8 regime, and to bring it in line with the Schedule 8 regimes for franchised and open access passenger, and freight operators. This is particularly important, given the large increase in the charter operator payment rate, which without the introduction of benchmarks could leave charter operators considerably worse off financially. Our intention is that the benchmarks will be calculated using the record of Network Rail and charter operator caused delay minutes during CP4.

20.146 On the basis of CP4 delays and draft CP5 payment rates, we estimate that the introduction of Schedule 8 benchmarks alongside a capacity charge will result in charter operators being better off financially than with the continuation of a Schedule 8 with no benchmarks and no capacity charge.

Incident caps

20.147 In CP4, incident caps limited the amount of compensation per incident paid by charter operators to Network Rail under the Schedule 8 regime to £5,524. The same incident cap applied to compensation paid by Network Rail to charter operators, but has rarely been employed in practice, with Network Rail compensation to charter operators typically being for minor delays. Charter operators do not currently pay an ACS for incident caps.

20.148 An unfunded incident cap protects charter operators financially from Schedule 8 payments above £5,524 related to their delaying other operators. Following our November 2012 consultation on Schedules 4 and 8 we have decided to leave the incident cap (with no ACS) unchanged. Stakeholders provided evidence that the private insurance market would be unlikely to provide an affordable alternative to obtain financial protection facilitated by the incident cap. Given the increase in the charter operator payment rate, we do not plan to require charter operators to pay an ACS in return for the £5,524 incident cap, during CP5. In our final determination we will ensure Network Rail's funding requirement reflects elements of the charter regime that are not expected to be financially neutral during CP5.

Schedule 4 possessions regime

Passenger possessions regime

20.149 The Schedule 4 passenger regime was significantly overhauled in PR08. We are not making major changes to the regime as part of this periodic review, but there are a number of aspects we have reviewed in order to improve the incentives for Network Rail to plan possessions effectively and efficiently and to reduce the impact of possession disruption to passengers and freight customers. The main issues where we are proposing changes are in relation to replacement bus cost compensation and the level of compensation payable to operators where Network Rail makes late changes to Type 1 possessions.

Bus cost compensation formula

20.150 Franchised passenger train operators receive compensation for the cost of running rail replacement bus services where train services are cancelled due to possessions. Some stakeholders raised concerns in this periodic review about whether the level of bus compensation reduces the incentive on train operators to fully explore timetable solutions when dealing with service disruption as a result of possessions and encourages them to over rely on running rail bus replacement services, instead of running trains. For example, in a Passenger Focus survey of passengers' attitudes to possessions in September 2012, 55% of passengers surveyed said they would not travel by train if it involved the use of a bus for part of or all of their journey. Conversely, in industry discussions a number of train operators have stated that the current formula does not fully compensate them for bus costs.

20.151 Bus cost compensation is based on estimated bus miles (EBMs) and EBM payment rates, which represent the rate of compensation operators receive in £ per replacement bus mile operated. EBM payment rates are paid at two rates – one for London & South East services and one for services in the rest of the country. In our November 2012 consultation we proposed uprating EBM payment rates so that they reflect better the cost per mile of running replacement buses.

20.152 We have collected data from train operators on how much bus cost compensation they received and how much they actually spent on providing replacement buses in financial years 2010-11 and 2011-12. The results are summarised in Table 20.7 below, based on 89% coverage of train operators surveyed. They show that franchised operators which attract the London & South East EBM payment rate were,

on average, overpaid bus cost compensation for services by 10.7% and 5.4% in 2010-11 and 2011-12 respectively[381]. And those that attract the EBM payment rate for the rest of the country were over paid by 9.4% and 8.2% over the same period.

Table 20.7: Percentage difference between replacement bus cost compensation and actual bus cost

EBM Rate	2010-11	2011-12
London & South East	10.7%	5.4%
Rest of the country	9.4%	8.2%

20.153 We have decided to adjust bus compensation rates down by 7.9% for London & South East and 8.9% for the rest of the country, so they reflect our estimate of the real costs of providing replacement buses. In making our adjustment we calculated the average rate of bus costs overpayment based on the combination of the two years' data in order to smooth out the impact of variation in the level of possessions activity between years. We consider this decrease in EBM payment rates represents value for money for the taxpayer and removes any doubts of perverse incentives. It also will encourage train operators to drive down replacement bus costs.

Access Charge Supplement

20.154 Schedule 4 payments are funded through an access charge supplement (ACS) paid to Network Rail by franchised passenger train operators in return for receipt of full Schedule 4 compensation[382]. The ACS total reflects the amount Network Rail is expected to pay out in Schedule 4 possession compensation over the control period.

20.155 Network Rail's estimate of the total Schedule 4 cost for each control period is based on planned maintenance and renewals activity volumes and a Schedule 4 unit cost per asset type (e.g. track, signalling etc.) maintained or renewed. The base Schedule 4 cost for a control period is estimated by multiplying the planned volumes of each activity by the relevant Schedule 4 unit cost. For some asset types, such as bridges and tunnels, Network Rail does not have robust volumes data to base its

[381] London & south east EBM rate is £15.10 per EBM and rest of the country £10.15, (2011-12 prices)

[382] Open access operators can opt to pay the ACS if they wish to receive full Schedule 4 compensation.

Schedule 4 calculations on; for these asset types it uses forecast levels of maintenance and renewals spend as proxy for volumes.

20.156 For CP5, Network Rail has improved its methodology for calculating the ACS by forecasting planned activity volumes at route, rather than national level. This will help to bring Schedule 4 costs closer to the actual level of possessions faced by franchised passenger operators in each area. The ACS will continue to be apportioned pro-rata amongst franchised passenger operators based on historic Schedule 4 compensation payments paid to operators.

20.157 As in PR08, Network Rail estimated the per activity CP5 Schedule 4 unit costs at a national level because of the difficulty of producing robust estimates at route level due to the variability of data between routes for certain asset types such as signalling.

20.158 In response to our November 2012 consultation, respondents generally approved Network Rail's approach but requested we closely scrutinise Network Rail's ACS estimate. Respondents also called for further consideration of how Network Rail might develop a means to calculate route based Schedule 4 cost estimates for CP6.

20.159 Network Rail provided its estimated Schedule 4 costs as part of its SBP submission. Table 20.8 below sets this out:

Table 20.8: Passenger Schedule 4 costs and ACS estimate for CP5 in Network Rail's SBP submission

£m 2012-13 prices	CP4	CP5					CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Great Britain							
Franchised passenger Schedule 4 costs	(168)	(140)	(147)	(151)	(137)	(136)	(710)
Franchised Passenger ACS	141	140	147	151	137	136	710
Total	**26**	**0**	**0**	**0**	**0**	**0**	**0**
England & Wales							
Franchised passenger Schedule 4 costs	(155)	(126)	(130)	(131)	(122)	(121)	(630)

£m 2012-13 prices	CP4			CP5			CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Franchised passenger ACS	137	126	130	131	122	121	630
Total	**(18)**	**0**	**0**	**0**	**0**	**0**	**0**
Scotland							
Franchised passenger Schedule 4 costs	(13)	(14)	(17)	(20)	(15)	(15)	(80)
Franchised passenger ACS	4	14	17	20	15	15	80
Total	**(9)**	**0**	**0**	**0**	**0**	**0**	**0**

Note: Numbers may not reconcile due to rounding.

20.160 We have closely scrutinised Network Rail's ACS estimate and methodology. Our own engineers have assessed Network Rail's volume forecasts and pre-efficient expenditure levels to ensure that these reflected the levels of planned maintenance and renewals in Network Rails SBP submission. We also appointed our independent reporters to carry out a detailed audit of Network Rail's ACS calculation, its use of historic possessions and forecast volumes data in calculating the ACS as well as comment on its ACS calculation methodology[383].

20.161 The audit focused on

(a) data quality; and

(b) process accuracy and reliability.

20.162 The reporters found that Network Rail's overall approach to calculating the ACS by calculating Schedule 4 unit costs based on historic data and applying forecast CP5 volumes was an appropriate methodology with no obvious alternative.

20.163 The reporters concluded that the computations within the spreadsheet were accurate, finding only minor errors which were subsequently corrected by Network Rail but which did not have a material impact on the ACS calculation. The reporters made a

[383] http://www.rail-reg.gov.uk/pr13/publications/consultants-reports.php

number of recommendations to improve data input and handling in the model and on improving its functionality.

20.164 The reporters suggested that Network Rail should explore the feasibility of using multiple years' historic possessions data to represent unit costs for future control periods.

20.165 There exists the risk that if Network Rail does not carry out the amount of maintenance and renewal activity it forecast when calculating the ACS it will not need as many possessions and will gain a windfall from not having to pay out as much Schedule 4 compensation. Conversely, it may pay out more in compensation than it receives in ACS payments if Network Rail carries out more maintenance and renewals activity than it forecast, and consequently needs more possessions.

20.166 We carried out our own assessment of the volumes data used in Network Rail's ACS calculation and found this to be broadly consistent with our assessment of Network Rail's maintenance and renewal programme for CP5. We made minor adjustments to reflect inconsistencies.

20.167 The reporters did not assess volumes data used in the ACS model directly as this is subject to a separate assessment. In summary this separate volumes assessment found elements of best practice in Network Rail's SBP submission but also indicated a degree of uncertainty about the accuracy and consistency of the data as it is drawn from a wide range of sources. Once we have completed our assessment of this separate report we may vary our maintenance and renewals volume assumptions in our final determination. We will then recalculate Network Rail's Schedule 4 funding requirement and the associated ACSs to reflect any adjustment we make to volumes.

20.168 Subsequent to its SBP submission Network Rail updated its ACS calculation to take account of the draft CP5 Schedule 8 payment rates as discussed in the Schedule 8 section above, changes to the level of notification discount factors as a result of revised late time multipliers and our decision to reduce replacement bus compensation rates. As a result of these changes, based on the draft Schedule 8 payment rates, Network Rail will need funding of £1.05bn for its Schedule 4 costs over CP5, compared with its SBP estimate of £710m. This represents an increase of 48%. For our final determination, we will update Network Rail's Schedule 4 funding requirement and the associated ACSs, so they are based on the final Schedule 8

payment rates, and also incorporate any revisions we make to our renewals volumes assumptions.

20.169 Network Rail has projected Schedule 4 costs to be £168m for the final year of CP4. This compares with an average of £210m per year during CP5. The different is due to the increase in Schedule 4 payment rates, but there is also an increase in planned maintenance and renewals activity in CP5 compared to CP4.

20.170 In CP5, there will be a disproportionately large increase in Schedule 4 costs in Scotland, compared with Great Britain as a whole. This is due to the increase in the amount of renewal activity in Scotland. The largest increase is in signalling renewals volumes, which in CP5 will be almost 700% higher than in CP4.

20.171 Table 20.9 sets out our draft determination of Network Rail's Schedule 4 costs and ACS for CP5. Table 20.10 sets out the Schedule 4 ACS by train operator.

Table 20.9: Our draft determination Network Rail's passenger Schedule 4 costs and ACS income for CP5[384]

£m 2012-13 prices	CP4			CP5			CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Great Britain							
Franchised passenger Schedule 4 costs	(168)	(206)	(218)	(223)	(202)	(201)	(1,050)
Franchised Passenger ACS	141	206	218	223	202	201	1,050
Total	**(26)**	**0**	**0**	**0**	**0**	**0**	**0**
England & Wales							
Franchised passenger Schedule 4 costs	(155)	(186)	(193)	(193)	(180)	(180)	(932)
Franchised passenger ACS	137	186	193	193	180	180	932

[384] Network Rail informed us that it had not included an ACS for Heathrow Connect in its ACS calculation. It estimates an ACS for Heathrow Connect between £50-£100 thousand per annum. We will consider whether we need to make an adjustment to reflect this in our final determination.

£m 2012-13 prices	CP4			CP5			CP5
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Total	**(18)**	**0**	**0**	**0**	**0**	**0**	**0**
Scotland							
Franchised passenger Schedule 4 costs	(13)	(20)	(24)	(30)	(22)	(21)	(118)
Franchised passenger ACS	4	20	24	30	22	21	118
Total	**(9)**	**0**	**0**	**0**	**0**	**0**	**0**

Note:

1. CP4 2013-14 Schedule 4 figures are projections contained within Network Rail's SBP submission.
2. Numbers may not reconcile due to rounding.

Table 20.10: ACSs for franchised passenger operators

£m 2012-13 prices	CP5					CP5
	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Arriva Cross Country	18.2	18.2	17.9	16.3	15.9	86.6
Arriva Trains Wales	9.0	5.6	8.5	4.9	4.1	32.1
c2c	2.9	3.5	4.1	3.2	2.7	16.3
Chiltern	2.7	2.9	2.9	3.0	2.5	13.9
East Coast	28.4	35.9	36.0	33.0	40.9	174.2
East Midlands	7.9	7.1	6.4	5.5	4.9	31.9
First Capital Connect	6.7	7.3	6.8	6.3	6.9	34.1
First Great Western	28.8	25.3	26.5	22.5	23.7	126.9
First ScotRail	6.9	8.4	10.2	7.6	7.3	40.4
First Trans Pennine Express	6.2	6.8	6.9	6.8	6.4	33.1
Greater Anglia	12.9	15.7	18.2	14.2	12.3	73.2
Heathrow Connect	-	-	-	-	-	-
London Midland	4.4	4.6	4.7	4.8	4.0	22.4
London Overground	3.5	3.7	3.8	3.6	3.3	18.0

£m 2012-13 prices	CP5					CP5
	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Merseyrail	1.2	1.2	1.3	1.3	1.1	6.1
Northern	8.5	9.3	9.3	9.3	9.0	45.4
South West Trains	14.7	14.0	15.9	17.9	13.5	76.1
Southeastern	14.2	16.9	13.2	13.5	13.2	71.0
Southern	11.8	12.8	10.5	10.5	13.1	58.8
Virgin West Coast	16.9	18.4	20.0	18.1	15.9	89.4
Total	**205.7**	**217.8**	**223.0**	**202.2**	**200.9**	**1,049.6**

Note: Numbers may not reconcile due to rounding.

Notification discount factors

20.172 As discussed above, Network Rail receives a discount on the amount of Schedule 4 revenue loss compensation it pays to franchised passenger train operators for early notification of planned possessions; this is known as the notification discount factor[385]. The discount reflects the reduced impact on train operators' revenues where passengers receive early notice of service disruption due to possessions.

20.173 There are three levels of notice (known as notification thresholds) and the amount of discount differs for each threshold. Table 20.11 summarises the notification factors applied at each notification threshold for the majority of rail services as set at PR08. Notification discount thresholds are the same for all franchised train operators, whereas the level of discount varies slightly depending on the characteristics of particular services.

[385] Defined as percentage of marginal revenue effect (MRE) payable.

Table 20.11: CP4 Notification factors and thresholds

	By New Working Timetable[386]	By 22 weeks before possession[387]	By Applicable Timetable[388]
Service groups with late time multiplier[389] of 2.5	55% of MRE[390] Payable	70% of MRE Payable	85% of MRE payable
Service groups with delay multiplier 5.1/6.5	45% of MRE Payable	65% of MRE Payable	85% of MRE payable

20.174 Notification factors differ according to the late time multiplier used to calculate the Network Rail Schedule 8 payment rates.

20.175 The higher the late time multiplier, the more passengers are inconvenienced by unscheduled delay relative to timetabled increases in journey time, and therefore, the greater benefit to passengers of early notification of possessions. As discussed above, late time multipliers vary for different types of passenger journey and have been updated for PDFH 5.1.

20.176 As part of its calculations of updated Schedule 8 payment rates, Halcrow has calculated a draft average late time multiplier for each service group, which is the weighted average of the late time multiplier for each passenger journey within that service group. These will be updated in time for our final determination to reflect the adjustments that were made to the PDFH late time multipliers for London and South East commuter passengers, between Halcrow carrying out these calculations and the final version of PDFH 5.1.

20.177 Table 20.12 sets out the range of late time multipliers for which respective notification discount factors will apply.

[386] The version of the timetable issued 26 weeks before it comes into operation. It broadly reflects the earliest operators are able to inform passengers of planned service disruption.

[387] Notification by this point allow the possession to be reflected in the informed traveller timetable

[388] The Working Timetable for any day as issued at 10pm, the previous night.

[389] Formerly known as delay multipliers.

[390] MRE refers to the Marginal Revenue Effect. This is the amount of long-term revenue estimated to be lost by a passenger operator per minute of lateness per passenger. The revenue is lost because a proportion of passengers switch away from travelling by rail because of delays. The Network Rail payment rate therefore reflects the MRE.

Table 20.12: CP5 revised notification factors for service groups, by late time multiplier

Average late time multiplier	By New Working Timetable	By 22 weeks before possession	By Applicable Timetable
4.3 or higher	40% of MRE Payable	63% of MRE Payable	85% of MRE Payable
3.4 to 4.2	45% of MRE Payable	65% of MRE Payable	85% of MRE Payable
2.8 to 3.3	50% of MRE Payable	68% of MRE Payable	85% of MRE Payable
2.7 or less	55% of MRE Payable	70% of MRE Payable	85% of MRE Payable

Additional protection for late changes to possession plans

20.178 In response to our May 2011 and December 2011 consultations, a number of franchised passenger train operators said that the current Schedule 4 incentivises Network Rail to book possessions early in order to receive the maximum discount, even where the work to be undertaken is not very certain. Train operators have argued that as a consequence too many possessions are poorly planned and/ or subject to late notice changes or cancellations. These late changes, they argue, impact on franchise operators in terms of reputational damage and because they incur direct costs that cannot be recovered under Schedule 4, if services are reinstated.

20.179 It is right that Network Rail is encouraged to inform operators about possessions as early as possible; provided that they are not booked so far in advance that they cannot be planned properly. We are aware that there is sometimes a misperception that the cause of Network Rail to book possessions too far in advance is principally due to the notification discount factors and thresholds within Schedule 4, in particular where the maximum discount threshold is set. Possessions are often planned long before the first notification discount threshold, which is set at publication of the new working timetable. It is our view that it is Network Rail's timetable and engineering planning process and in particular the timescales for completing the Engineering Access Statement that is the primary driver of some possessions being booked very far in advance. We consider changes to the timetable planning process would be more effective in addressing this problem than a change to the first notification

discount threshold within Schedule 4. Changes to the timetable planning process are dealt with under the Network Code and as such not part of this periodic review.

20.180 We do, however, think it is right that operators should be compensated for costs incurred where cancellations or late changes are made to possessions by Network Rail. In order to recover these additional costs incurred and also act as an incentive on Network Rail to plan possessions more carefully at the outset, ATOC proposed extending the scope of the protection provided by paragraph 2.9 of Schedule 4[391] to enable the recovery of direct costs related to amended or cancelled Type 1 possessions. ATOC suggested that the threshold for triggering a claim should be set at £5,000 per possession[392].

20.181 Subsequent to our November 2012 consultation, Network Rail has proposed that this protection should be based on a liquidated damages regime to reduce transaction costs and uncertainty. Network Rail has recently sent out a letter to consult on this proposal. We are not convinced that a liquidated damages regime would be appropriate in this instance. While Network Rail has not been able to provide us with data on the number or proportion of possessions that are later cancelled, we expect this to be much lower in magnitude than the number of possessions planned in the first place. Costs incurred by train operators are likely to vary in nature and amount depending on the characteristics of the possession and the point of time it is cancelled.

20.182 We therefore plan to increase the protection provided by paragraph 2.9 of Schedule 4 to enable the recovery of direct costs related to amended or cancelled Type 1 possessions, for cancelled possessions where the resulting costs incurred are £5,000 or more. Our view overall is that a liquidated damages regime is not justified in this instance given the likely number of claims, and complexity in developing it in such a way that it would appropriately compensate train operators. However, when we

[391] In broad terms, under paragraph 2.9, where a booked possession is changed from one type to another (or even cancelled entirely), the affected operator's compensation rights are limited to what would have been available as if the new type of possession had been booked in the first place. If the operator has already committed or incurred reasonable costs before the amendment, however, it may still recover those, but only to the extent that the same would have been recoverable for the original type of possession anyway.

[392] For Type 2 and 3 possessions, the threshold for claiming additional compensation is £10,000. We have set the threshold for Type 1 possessions at £5,000 as this is closer to typical level of cost faced by operators where cancellations or changes to Type 1 possessions are made at short notice.

conclude on this in our final determination, we will take into account the proposal Network Rail outlines in its letter and responses it receives from stakeholders.

Sustained planned disruption

20.183 The sustained planned disruption (SPD) mechanism is designed to protect train operators from instances where there is severe disruption caused by possessions over a sustained period. Additional compensation for SPD is triggered when the impact of severe disruption crosses a pre-defined level (in terms of revenue lost and increased costs) at which point train operators may claim additional revenue/ cost compensation above that covered by the liquidated sums payable under Schedule 4.

20.184 As part of the Schedules 4 and 8 working group, papers submitted by both Network Rail and ATOC agreed that there was no desire for a major change to the existing system apart from clarification of the contractual wording to provide greater clarity between franchised passenger operators and Network Rail over the interpretation of the SDP provisions. ATOC in particular stated that different interpretations of contractual provisions relating to the SPD mechanism can make claiming compensation more contentious and difficult to price than ought to be the case.

20.185 We are making a minor change to the SPD provisions within the passenger track access contract to ensure that they are consistent with purpose of the SPD mechanism as determined at PR08 and that criteria set out for claiming additional revenue loss and cost compensation is clear and unambiguous to all parties. These changes will be included in our revised drafting of the template track access contracts, which we will consult on in July 2013

Revenue loss formula

20.186 In our November 2012 consultation, we also considered making changes to the replacement bus revenue formula aspect of Schedule 4 to address anomalies in how the revenue loss formula compensates franchised passenger train operators where replacement buses are used as substitutes for cancelled train services. We have decided not to make changes to this aspect of Schedule 4. This is because the ‘average regime’ nature of Schedule 4 means it is likely to result in cases where it over or undercompensates operators, and we are keen not to make changes unless they are likely to result in real benefits. This is supported by responses to our November 2012 consultation and in discussions with the Schedules 4 and 8 industry working group.

Freight possessions regime

20.187 Freight operators receive compensation within Schedule 4 for planned disruption. Compensation for planned disruption notified before T-12[393] is based on three tiers of disruption, each tier representing different levels of disruption faced by freight operators. Flat rate liquidated sums are paid for the first two tiers, with the possibility of additional actual costs/losses available for the most disruptive possessions. The criteria for possession types and compensation rates (2012-13 prices) for each tier is set out below in Table 20.13. Unlike franchised passenger operators, freight operators do not pay an ACS in order to be able to receive compensation under Schedule 4. The expected costs of freight Schedule 4 are instead funded by the government as part of Network Rail's funding requirement.

Table 20.13 Structure of freight Schedule 4 possessions regime

Possession notified before T-12	Possession notified after T-12
Category 1 compensation - £300 per service • Additional end to end journey distance greater than 10 miles; or • Planned departure time from Origin differs by more than 60 minutes; or • Planned arrival time at Destination differs by more than 60 minutes; or • More demanding length or weight restrictions imposed.	**Service variation - £596 per service** • Additional end to end journey distance is greater than five miles; • The addition of at least one Planned reversing movement; • More demanding length, weight or gauge restrictions imposed; • The use of at least one additional locomotive; • The use of diesel instead of an electric locomotive is required; • Planned departure time from Origin differs by more than 30 minutes; • Planned arrival time at Destination differs by more than 30 minutes; • The service is treated as a train operator variation request.

[393] T-12 refers to twelve weeks before the date of the possession.

Possession notified before T-12	Possession notified after T-12
Category 2 compensation - £800 per service • The affected service is cancelled, or; • More demanding gauge restrictions , or; • The use of at least one additional locomotive is required, or; • The use of a diesel locomotive as a substitute for an electric locomotive is required.	**Late Notice - £1,566 per service** • The service is cancelled.
Category 3 - possibility of actual costs/losses in addition to liquidated damages • Access from Origin or to Destination is blocked (incl. where a suitable gauge cleared route is not available for longer than 60 hours); or • Any of the freight conveyed on the service has to be transported by other means; or • The use of at least one additional locomotive is required; or • The use of a diesel locomotive as a substitute for an electric locomotive is required.	**Category 3 - possibility of actual costs/losses in addition to liquidated damages** • Access from Origin or to Destination is blocked (incl. where a suitable gauge cleared route is not available for longer than 60 hours); or • Any of the freight conveyed on the service has to be transported by other means; or • The use of at least one additional locomotive is required; or • The use of a diesel locomotive as a substitute for an electric locomotive is required.

20.188 Currently, freight compensation is set at a level broadly reflecting the amount paid out under Part G of the Network Code prior to PR08. (The Schedule 4 provisions under Part G were removed when Schedule 4 was overhauled as part of PR08.)

20.189 Freight operators consider that this level of funding no longer reflects the costs incurred due to possessions and that we should adopt a different basis for setting compensation rates.

20.190 Currently Network Rail is funded around £8.2m per annum (2012-13 prices) to compensate freight operators for disruption due to maintenance and renewal possessions. This is funded by government subsidy. It remains open for freight operators to receive increased Schedule 4 payment rates in return for paying an ACS.

20.191 In our November 2012 consultation, we stated that we were not minded to increase the level of funding for the freight regime unless we received compelling arguments as to why we should do so.

20.192 Since then we have received information from Network Rail about the forecast levels of possession activity, and therefore the disruption freight operators are likely to face during CP5. Based on this information, freight operators are likely to face a considerable increase in the level of disruption compared to CP4. If we were to keep the level of funding constant, this would mean compensation rates for freight operators would fall by approximately 30%.

20.193 We have assessed the information supplied by Network Rail about the forecast level of possessions disruption faced by freight operators in CP5 and found this to be correct.

20.194 We consider such a forecast 30% fall in compensation rates would significantly reduce the incentive on Network Rail to limit the amount of disruption faced by freight operators. It would also lead to a significant reduction in the levels of compensation received by freight operators. We therefore have decided to maintain the current compensation rates in real terms; adjusting the level of funding accordingly to reflect the forecast increase in activity levels. This means the average annual freight Schedule 4 maintenance and renewal possessions compensation funding will increase to £12.2m per annum, an increase of around 49%.

20.195 Table 20.14 summarises our determination of the level of funding Network Rail will require in CP5 to cover its expected freight Schedule 4 costs.

Table 20.14: Our determination of Network Rail's freight Schedule 4 funding requirement for CP5[394]

£m 2012-13 prices	CP5					CP5
	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Great Britain	11.7	12.4	13.0	11.7	11.8	**60.7**
England & Wales	10.3	10.7	11.0	10.2	10.3	**52.5**
Scotland	1.4	1.7	2.1	1.5	1.5	**8.2**

Note: Numbers may not reconcile due to rounding.

[394] Network Rail has subsequently informed us that it did not include funding for service variations payments compensated under Schedule 4. It now estimates that it will require funding of around £612,000 (2012-13) prices. We will consider this for our final determination.

Summary of main differences between CP4 and CP5

20.196 Table 20.15 summarises the main changes in CP5 compared to CP4

Table 20.15: Main changes in CP5 compared to CP4

Which Schedule 4 or Schedule 8?	What has changed?
Schedule 8 for franchised and open access passenger operators	• Payment rates have been updated to reflect the latest evidence on the impact of performance on long-term passenger revenue • Benchmarks have been updated to reflect our expectation of performance in CP5 • Passenger charter element of Schedule 8 has been removed
Schedule 8 freight operators	• The freight operator payment rate has been updated to reflect the increase in passenger Schedule 8 payment rates • Benchmarks have been updated to reflect our expectation of performance in CP5 • Bonus payment rates will be set at same level as compensation payment rates
Schedule 8 for charter operators	• Introduction of benchmarked Schedule 8 to be consistent with Schedule 8 for freight operators • Charter operator payment rate has been updated to reflect the increase in passenger Schedule 8 payment rates
Schedule 4 for franchised passenger operators	• Schedule 4 revenue loss payment rates are being updated to reflect the increase in Schedule 8 payments. • Replacement bus cost compensation rates have been reduced to reflect actual cost of operating replacement buses • Notification discount factors have been updated to reflect revised late time multiplier values • The Schedule 4 access charge supplement (ACS) has been updated to reflect the change in Schedule 4 payment rates and notification discount factors • Compensation for costs incurred as a result of Network Rail cancelling or amending possessions at late notice has been extended to Type 1 possessions
Schedule 4 for freight operators	• Network Rail's funding to cover the expected cost of freight Schedule 4 compensation has been increased to maintain compensation payment rates at CP4 levels in real terms.

21. Affordability of the HLOSs

Key messages in this chapter

- We have reviewed the financial forecasts provided by DfT and Transport Scotland to support their HLOSs.
- We have combined our determination assumptions of Network Rail's revenue requirement with the costs and revenues that the governments have forecast for franchised train operators and the amount of public funding that is available in CP5.
- The assessment shows that in total the DfT has a small surplus against its funds available and Transport Scotland a small deficit. The extent of the deficit or surplus varies by year.
- Although the figure for Scotland is currently negative, at this stage we consider that the gap will be closed, partly because the exact funding levels for projects in CP5 have not yet been finalised. We also consider that the profile of Network Rail's expenditure and revenue in CP5 will change by the final determination, closing the DfT deficit years.

Introduction

21.1 This chapter sets out our assessment of whether the England & Wales and Scotland HLOSs can be delivered for the public funds (SoFAs) available.

21.2 The chapter has the following structure:

(a) an overview of our approach to determining affordability;

(b) a summary of DfT's financial forecast, on which it based its HLOS, and our analysis of this forecast;

(c) a summary of Transport Scotland's financial forecast, on which it based its HLOS, and our analysis of this forecast;

(d) a summary of our assessment of how much revenue Network Rail will need to deliver the HLOSs; and

(e) a summary of the results of our affordability assessment.

Approach

21.3 Our affordability calculation is a whole industry calculation; that is we must consider franchised train operators, freight and Network Rail. It is based on:

(a) the information on franchise support costs and revenues that DfT and Transport Scotland have provided to us;

(b) our analysis of those forecasts; and

(c) our calculation of Network Rail's SoFA revenue requirement.

21.4 We need to ensure consistency between the calculations carried out by the governments and ourselves. The franchised operators pay access charges to Network Rail and, in producing their franchise subsidy forecasts, DfT and Transport Scotland included estimates of these costs. We have adjusted for these franchise payments to Network Rail.

DfT's financial forecasts and our analysis

21.5 DfT provided us with commercially confidential data underpinning its financial forecasts, including:

(a) base (before changes expected as a result of the HLOS) revenues and costs for each of the franchises operators;

(b) a risk analysis including the forecast impact of revenue sharing arrangements; and

(c) forecast incremental costs, mainly assumptions on new rolling stock required and the associated lease costs.

21.6 We were also provided with underlying policy assumptions including the assumptions on regulated fares, i.e. the assumptions that have been made by both governments on any increases in regulated fares over CP5. Unregulated fares are assumed to increase in line with regulated fares for forecasting purposes.

21.7 DfT has excluded some capital programmes such as non-Network Rail parts of Crossrail and High Speed 2 from its SoFA because these are separate companies and so they are identified separately by DfT. DfT's SoFA also does not reflect any funding provided by the Welsh Government.

21.8 We reviewed DfT's analysis in terms of whether the assumptions made were reasonable.

21.9 As in PR08, we decided it was not sensible for us to produce our own passenger demand forecasts as this would just duplicate DfT's role. Instead, we checked the consistency of DfT's forecasts, their completeness and their reasonableness.

21.10 After we received Network Rail's SBP, it became apparent that DfT's calculation had underestimated the likely costs of depots and stabling and hence we assumed a further capital cost of £224m, with funding in CP5 based on only paying for a part of the capital costs within the control period (i.e. payments are spread over time).

21.11 We found DfT's assumptions on franchise revenues to be reasonable, with revenues forecast to rise by 3% per annum, below recent trends (over the last five years franchise revenue has grown by more than 50%).

21.12 Base costs were assumed to be stable, which again we found to be reasonable. When we assess Network Rail's revenue requirement, we make assumptions about how much the company can increase its efficiency by. Similarly, DfT considered efficiency improvements for franchise train operators, particularly in the light of the RVfM study.

21.13 We reviewed the efficiency assumptions and found them to be reasonable, based on examples of potential efficiency improvements that DfT provided. However, after the cancellation of the West Coast Main Line franchise competition in October 2012, we went back to DfT to discuss whether the initial assumptions were still reasonable, given the delays to the franchise letting programme and the increased emphasis on negotiating direct awards with existing franchises. DfT provided us with further evidence to support its numbers.

21.14 As HLOS capacity enhancements had not been fully defined at the time of the HLOS, DfT assumed that any additional revenue would broadly cover the operating costs of the additional rolling stock required, which is reasonable.

Transport Scotland's financial forecasts and our analysis

21.15 The financial forecasts are simpler in Scotland as there are only two franchises – the ScotRail franchise and the franchise for Caledonian Sleeper services. We carried out

a similar assessment for Scotland as we did for England & Wales and concluded that the forecasts were reasonable.

Network Rail's revenue requirement

21.16 To carry out the affordability calculation, we need to include Network Rail's revenue requirement, as forecast in earlier chapters. For our assessment we have used Network Rail's SoFA revenue requirement[395]. This is the gross revenue requirement that we determine will be received from all funding sources less our assumptions for the income that Network Rail will receive from sources other than franchised passenger train operating companies, which offsets the gross revenue requirement. This 'SoFA other single till income' is principally from property rental and sales, freight charges, Crossrail charges and facility charges.

21.17 It is the SoFA revenue requirement – the level of Network Rail's revenue requirement that is funded by access charges (track and station) from franchised passenger operators, or grant paid by government in lieu of track access charges – that is relevant for the level of public financial support for the railways, as set out in the SoFAs.

21.18 Tables 21.1 and 21.2 summarise the revenue requirement calculations in England & Wales and Scotland to deliver the HLOSs. CP4 equivalents have not been included as this would not be a meaningful comparison because the HLOSs published in PR08 were different to those in PR13.

Table 21.1: Our assessment of Network Rail's CP5 SoFA revenue requirement to deliver the HLOS – England & Wales

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Gross revenue requirement	**5,550**	**5,633**	**5,691**	**5,770**	**5,887**	**28,530**
SoFA other single till income	(424)	(488)	(539)	(591)	(639)	(2,682)
SoFA revenue requirement	**5,125**	**5,144**	**5,151**	**5,179**	**5,247**	**25,847**

[395] This definition is consistent with the SoFA revenue requirement presented in Network Rail's IIPs, our May 2012 advice to ministers and Network Rail's strategic business plans.

Table 21.2: Our assessment of Network Rail's CP5 SoFA revenue requirement to deliver the HLOS – Scotland

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Gross revenue requirement	**619**	**644**	**658**	**655**	**656**	**3,231**
SoFA other single till income	(26)	(29)	(31)	(34)	(37)	(156)
SoFA revenue requirement	**593**	**615**	**627**	**621**	**619**	**3,075**

Results of our affordability analysis

21.19 Table 21.3 summarises our calculations for England & Wales. The steps in the process are:

(a) starting from the SoFA (which is in nominal terms), we converted the SoFA into real prices (2012-13 prices);

(b) we deducted the franchise support payment from the total funds available;

(c) we added back the payments made by franchise operators to Network Rail as assumed by DfT; and

(d) the resulting total was then compared to our calculation of Network Rail's SoFA revenue requirement to calculate a 'surplus' or 'deficit' of funds.

Table 21.3: Results of the affordability calculation for CP5 – England & Wales[396]

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total
SoFA	**2,988**	**3,110**	**3,004**	**3,000**	**2,823**	**14,924**
Less franchise support payment	(257)	(90)	(198)	(154)	(263)	(961)
Add back franchise payments to Network Rail (as assumed in the SoFA)	1,969	2,000	1,981	2,017	2,017	9,984
Funds available for Network Rail	**5,213**	**5,201**	**5,183**	**5,170**	**5,102**	**25,869**
Less Network Rail revenue requirement to deliver the HLOS	(5,125)	(5,144)	(5,151)	(5,179)	(5,247)	(25,847)
Surplus/ (deficit)	**88**	**56**	**32**	**(9)**	**(145)**	**22**

Note: Bracketed terms are negative.

21.20 Table 21.4 summarises our calculations for Scotland. The steps in the process are:

(a) starting from the SoFA (which is in nominal terms), we converted the SoFA into real prices (2012-13 prices);

(b) as Transport Scotland's published SoFA reflected only the funds available for CP5 infrastructure spending (and also incorporated payments made by franchise operators to Network Rail), we did not need to adjust the SoFA to determine the total funds available; and

(c) the resulting total was then compared to our calculation of Network Rail's SoFA revenue requirement to calculate a 'surplus' or 'deficit' of funds.

[396] The gross revenue requirement in this table is higher than in chapter 14 as this reflects additional costs of depots and stabling. These costs were not included in DfT's SoFA. As Network Rail might not be the delivery organisation, and RAB funding might not be the chosen mechanism in all cases, we have not included these additional costs in Network Rail's gross revenue requirement in chapter 14.

Table 21.4: Results of the affordability calculation for CP5 – Scotland

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	Total
SoFA	**605**	**612**	**596**	**587**	**581**	**2,981**
Funds available for Network Rail	**605**	**612**	**596**	**587**	**581**	**2,981**
Less Network Rail revenue requirement to deliver the HLOS	(593)	(615)	(627)	(621)	(619)	(3,075)
Surplus/ (deficit)	**12**	**(3)**	**(31)**	**(34)**	**(37)**	**(94)**

21.21 Taking into account the assumptions underlying our analysis, the total cost of the Scottish Ministers' specification is slightly above the funds available, while the Secretary of State's is slightly below. The England & Wales numbers show a mix of positive and negative, while the numbers for Scotland have four negative years. These numbers could change by the final determination and we must notify the relevant government if at any time we decide the specification is not affordable.

21.22 Although the figure for Scotland is currently negative, at this stage we consider that the gap will be closed, partly because the exact funding levels for projects in CP5 have not yet been finalised and other assumptions could change. We also expect some reprofiling of expenditure and revenue for the final determination which we expect will remove the DfT negative years.

21.23 If it appears that there will be a surplus at the time of the final determination we would agree with the relevant government how this should be treated.

22. Implementation of our determination

Key messages in this chapter

- The implementation of PR13 will require the amendment of track and station access agreements and Network Rail's network licence. We will start the statutory process to do this on 20 December 2013.
- We will consult on the proposed amendments in July 2013. We will also seek views from Network Rail and train operators on what bespoke provisions in their track access agreements (if any) should roll-forward to CP5.
- In the event of a delay to the statutory implementation process, we have a contingency plan to ensure that the main access charges that fund the running of the railway are not disrupted.

Introduction

22.1 This chapter sets out how we will implement our PR13 determination. It gives an overview of:

(a) the background to the statutory implementation process and the access agreements that are within the scope of PR13;

(b) the process for making changes to access agreements and the network licence to give effect to this determination; and

(c) contingency arrangements if there is a delay to implementation.

The implementation process – background

22.2 As an access charges review, PR13 ultimately involves the review and amendment of the amounts payable under, and associated provisions within, access agreements between Network Rail and its customers ('beneficiaries'). This includes the charges levied for the use of the track or stations, and the possessions and performance compensation regimes and efficiency benefit sharing mechanisms. Our overall decisions on PR13 will therefore need to be implemented through changes to track and station access agreements. We will also need to amend Network Rail's network licence (through which we hold it to account) so that it reflects key policy decisions.

22.3 The process for implementing access charges reviews is set out in Schedule 4A to the Railways Act 1993, which requires us to issue a series of notices:

(a) a review initiation notice;

(b) review notices;

(c) notices of agreement; and

(d) review implementation notices.

22.4 A review initiation notice formally sets out our intention to carry out an access charges review. On 15 March 2012, we issued a review initiation notice relating to both track and station access agreements[397].

22.5 Once we have reached our conclusions (i.e. our final determination) in an access charges review, we then issue review notices which begin the implementation phase of the access charges review. These must:

(a) state our conclusions and the reasons why we have reached those conclusions. We will do this by incorporating our published final determination document into the notice;

(b) specify the changes which we propose to make to any access agreements for or in connection with giving effect to our final determination;

(c) state the date on which we propose that each of those changes should come into operation; and

(d) specify a period of not less than six weeks from the date of issue of the review notices in which Network Rail may object to any of the proposed changes.

22.6 We will send a copy of the review notices containing revised provisions to Network Rail, each affected beneficiary, the Scottish Ministers, the Secretary of State and HM Treasury. We intend to issue the review notices on 20 December 2013. At the same time, we will approve the price lists produced by Network Rail that set out the charges to be paid by train operators that are incorporated into access contracts. We will publish the review notices on our website after making any appropriate redactions.

[397] Our review initiation notice issued on 15 March 2012 is available at: http://www.rail-reg.gov.uk/pr13/PDF/review-initiation-notice.pdf.

22.7 Consistent with previous practice, our review notices will also include a provision providing that if we approve or direct amendments to an access agreement after we have served the review notice but before it comes into effect, then those later amendments will come into effect subject to the changes we propose in the review. If there is any conflict between the changes we propose in the review notice and the changes we have approved or directed subsequently, the latter will take precedence.

22.8 Any access contracts entered into after the date we issue our review notices cannot be included within the scope of the notice. Nonetheless, they still need to be subject to PR13. We will ensure there are provisions in those contracts to ensure that relevant PR13 amendments can be made to them once CP5 begins. We will also need to make similar arrangements for those contracts that may be entered into shortly before the review notice is issued.

22.9 If Network Rail objects to any review notice, we may issue a new review notice or make a reference to the Competition Commission. Should we issue a new review notice, then Network Rail would have a further period of not less than six weeks to make any objections to the new notice.

22.10 If Network Rail does not object to the review notices, we must serve a 'notice of agreement' on each beneficiary to an access agreement. The beneficiaries then have a period of 28 days to give notice to terminate their access agreements, should they wish to do so.

22.11 Following the expiry of this 28 day period, we will publish the review implementation notice, stating that our determination is to be implemented as proposed in the review notice. Through this process, the changes are implemented directly into the track and station access agreements specified in the review notice.

22.12 We intend to implement our PR13 determination on 1 April 2014. Our timetable is shown in Table 22.1 below.

Table 22.1: Key dates for the implementation process

Date	Milestone
20 December 2013	Issue review notices
7 February 2014	Deadline for Network Rail to object to the review notice
After 7 February 2014	If Network Rail does not object to our review notice, issue notice of agreement to beneficiaries of access contracts
March 2014	Issue review implementation notice
31 March 2014	Delivery plan published by Network Rail
1 April 2014	Implementation of PR13 determination

Changes to access agreements and the network licence

Consultation on proposed contractual changes to access agreements

22.13 PR13 will require changes to the various aspects of passenger, freight, freight customer and charter track access agreements (principally the access charges in Schedule 7 and financial compensation regimes in Schedules 4 and 8 where these exist, and will include operator specific information such as payment rates and benchmarks in Schedule 8). This will include new price lists incorporated into each track access agreement. It will also require changes to the long term charge in each station access agreement that falls within the scope of PR13.

22.14 On 12 July 2013, we will consult Network Rail and its access beneficiaries on how we propose to implement the decisions set out in this draft determination through changes to access contracts. We plan to hold a workshop with charter operators in late June/early July 2013 to discuss incorporating a Schedule 8 benchmark and capacity charge into their track access agreements. In light of this, we will consult later in July 2013 on any contractual changes we might be proposing in this regard.

22.15 In April and May 2013, Network Rail published initial drafts of its CP5 price lists and invited comments on them for accuracy[398]. By 12 July 2013, Network Rail will publish updated drafts of these price lists reflecting our draft determination. Train operators

[398] *Structure of charges: publication of draft CP5 price lists*, Network Rail, May 2013, available at http://www.networkrail.co.uk/PublicationofdraftCP5pricelists.pdf.

should take this opportunity to review and comment to Network Rail on these as the final versions we will approve in December 2013 cannot be changed.

22.16 Whilst we are not planning any associated changes to the Network Code as part of PR13, we will be making changes to the multilateral rules governing the use of on-train metering of traction electricity (the 'EC4T Metering Rules'). As set out in chapter 16, this will include moving the volume and cost wash-up provisions (which are multilateral processes) from the bilateral track access contracts to the multilateral EC4T Metering Rules. As part of this, the scope of the EC4T Metering Rules will be broadened to apply to all train operators (becoming the 'Traction Electricity Rules'). This will also enable the industry to take forward and implement during CP5 other improvements to provisions relating to traction electricity.

22.17 We will consult separately on the changes to EC4T Metering Rules/Traction Electricity Rules in July 2013.

Consultation on bespoke provisions within track access agreements

22.18 Most track access agreements are broadly consistent with our model contracts, but many contain bespoke provisions. For example, facility charges for investments paid for by the train operator, or additional charges to recover the cost of an operator running services beyond the normal opening hours of a route. Where these bespoke provisions need to be retained in CP5, we will need to reflect this in the changes we make to access agreements through our review notice – adapting the CP5 provisions as appropriate.

22.19 In preparation for this, we have been reviewing existing track access agreements (based on the consolidated versions of the contracts that Network Rail is required to produce) to understand what bespoke provisions there are in each contract and whether these should be retained.

22.20 Alongside the consultation on the proposed CP5 provisions, we will also provide Network Rail and each beneficiary with a list of the bespoke provisions (if any) that we have identified in their contracts along with our view on whether these should be retained or not. It will then be for them to confirm whether we have correctly identified the bespoke elements and advise if they disagree with us on what, if anything, should be rolled-forward. For example, we would not expect additional permitted charges relating to longer route opening hours to be carried forward if these longer opening

hours will be funded as part of the baseline capability of the network, which will be set at the level in place on 1 April 2014.

22.21 This consultation will end on 4 September 2013, aligned with the consultation on this draft determination. We will then review comments received on the proposed CP5 provisions ahead of finalising them once we have published our final determination. We will then begin to prepare the review notices for each train operator, taking into account the views received on what existing provisions should be retained for CP5.

Station access agreements

22.22 Amendments to station access agreements will be relatively straightforward compared to those for track. We will be amending the station long term charges for all regulated stations, including proposed changes to the indexation methodology for the long term charge.

22.23 We will also need to reflect that in CP5, Network Rail will recover Stations Information and Security Systems (SISS) costs from the station long term charge rather than through the fixed track access charge (for franchised stations) and through qualifying expenditure at Network Rail managed stations. Our decision on this change is discussed in chapter 16.

22.24 For franchised stations, the change to SISS can be addressed through the recalculation of the charges on the price lists. However, for the 17 managed stations, the station access conditions will need to be amended to make clear that qualifying expenditure no longer includes SISS. This will require a relatively straightforward amendment which we will include in our review notice in December 2013. We will consult on the proposed drafting changes in our consultation in July 2013.

Changes to Network Rail's network licence

22.25 As set out in chapter 12, we plan to update and amend licence condition 3 of Network Rail's network licence to:

(a) include separate restrictions on the level of Network Rail's financial indebtedness in England & Wales and Scotland;

(b) reflect the maximum levels of financial indebtedness; and

(c) make the year 5 CP5 level roll forward into CP6 until CP6's levels are set.

We also intend to amend licence condition 4 so that it more clearly reflects our policy on when Network Rail may pay a rebate to the governments, as set out above in chapter 12. Both these sets of changes are directly related to our PR13 determination.

22.26 We also propose to make improvements to other Network Rail network licence conditions. These will be either relatively minor updates or clarifications and refinements which we think are necessary to make the licence fit for purpose for CP5.

22.27 We will consult on the proposed drafting of changes to the network licence alongside the consultation on the contractual provisions on 12 July 2013.

Process for amending the network licence

22.28 There are two processes that we can use to implement licence changes, as follows:

(a) **schedule 4A of the Act** provides for us to amend any 'linked licence' (i.e. linked to the access agreements in respect of which we are carrying out PR13) through a review notice.

We plan to use this process for the amendments to condition 3 and 4 which are directly related to PR13. We will do this through the review notices we expect to issue on 20 December 2013; and

(b) **section 12 of the Act** sets out the process for amending licences with the consent of the licence holder and requires a minimum 28 day statutory consultation.

We expect to use this process for the other changes we propose to make to the licence to make it fit for purpose for CP5. After we have taken into account stakeholders' responses to the July 2013 consultation, later in 2013 we will conduct a 28 day statutory consultation on the modifications we intend to implement. Any such changes will take effect on or before 1 April 2014.

Contingency planning for a delay to the statutory implementation process

Background

22.29 There is a risk that the implementation process for PR13 could be delayed. As set out above, Network Rail has the right to object to our review notice. If it does so, we can issue new review notices and restart the implementation process, or we can refer the matter to the Competition Commission. In either scenario, the impact on timescales

will mean that PR13 cannot be implemented in time for 1 April 2014. The process could also be delayed by other events, such as a judicial review[399].

22.30 The Act does not specify what should happen in this scenario. In practice, it would mean a significant gap in Network Rail's funding because certain key charges (in particular the fixed charge paid by franchised operators) would not automatically roll-forward.

22.31 There are two broad options for addressing this: introduce a provision to either (1) roll-forward CP4 charges or (2) implement our PR13 determination (pending the ultimate resolution of the cause of the delay). In either case, depending on how the delay to implementation is resolved, there may be a need to issue new review notices with new charges and terms.

22.32 We do not think that all operators rolling forward their CP4 charges would be viable because:

(a) many of the charges in CP4 were profiled, and there is no reason to suppose that the charges payable for the final year of CP4 relate logically to the appropriate revenue which Network Rail should receive from 1 April 2014 onwards; and

(b) the charges set for CP4 relate to the delivery of outputs specified in the PR08 final determination. Network Rail should be committed to the new outputs for CP5.

Our proposal

22.33 On 17 April 2013, we wrote to Network Rail, train operators and other relevant parties proposing a contingency plan based on implementing the amendments specified in our PR13 review notices on 1 April 2014, notwithstanding a delay to the process for any reason[400]. This would then provide for Network Rail to start the delivery of regulated outputs as per our determination, with the revenue stream set by the determination.

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[399] For the remainder of this chapter, we use a Network Rail objection as the example, but a delay could be due to other reasons

[400] *Consultation on contingency planning for PR13 implementation*, April 2013, available at: http://www.rail-reg.gov.uk/upload/pdf/pr13-contingency-planning.pdf.

22.34 Under this arrangement, if ultimately the Competition Commission disagreed with our determination, we would have to take its findings into account in the changes we propose to be made to access agreements.

22.35 In our letter, we suggested operators of regular scheduled passenger services (franchised and open access operators) and Network Rail agree to amend their contracts to include a provision that would provide for this arrangement. This was on the basis that their agreements contain provisions that would time out at the end of CP4 if PR13 implementation were delayed.

22.36 We proposed that freight and charter passenger operators did not need to enter into it as the provisions in their contracts would not 'time out' at the end of CP4, and would be uplifted by inflation in the event of a delay. However, we asked freight and charter operators whether they would want to make the amendment in any case.

22.37 We discussed this arrangement with the Competition Commission and it raised no objections to it. It also noted that the plan would not in any way undermine Network Rail's statutory right to object to our review notice, nor would it prejudice the ability of ORR to take action following an objection such as issuing a new review notice or making a reference to the Competition Commission.

22.38 In our letter, we noted that where PR13 is finally implemented following a delay, Network Rail and each train operator may need to make adjustments to ensure that they would both be left in the financial position that they would have been in had PR13 implementation not been delayed and had taken effect from 1 April 2014. This would be necessary if the charges and other payments ultimately implemented for CP5 were different to those that had been paid from 1 April 2014. This would apply to all train operators, including:

(a) those that had entered into our proposed contingency arrangement (and where the charges finally implemented for CP5 were different to those paid from 1 April 2014, e.g. because we had had to issue a new review notice); and

(b) those that did not enter into our proposed contingency arrangement and had paid uplifted CP4 rates from 1 April 2014 until PR13 was finally implemented.

Responses and next steps

22.39 We received four responses to our consultation letter: Chiltern Railways, Freightliner Group; DB Schenker (including Rail Express Systems) and Network Rail[401].

22.40 Chiltern was content with our proposed approach subject to assurances from DfT that the franchise agreement provisions for 'no net loss, no net gain' would apply. DfT has confirmed that it supports our proposed contingency plan. It has said it will implement the CP5 charges for each TOC as required under its franchise agreement, should the contingency arrangement be triggered in the event of a delay to PR13 implementation. Similarly, Transport Scotland has confirmed it will apply schedule 9 of the ScotRail franchise agreement under these circumstances as well.

22.41 Freightliner Group was content to make the amendment, provided that all other freight operators did the same. DB Schenker did not wish to enter into the amendment, and instead wanted to leave the provisions in its contracts to roll-forward if there was a delay.

22.42 Network Rail was content with the proposed approach, but noted if implementation was delayed it would be unlikely that it would have developed a plan by the end of CP4 to deliver the required outputs for funding provided in ORR's final determination. It said that whilst it would continue to drive down costs, it would be uncertain whether the cost reductions assumed by ORR and the required outputs could be achieved. On this basis, it said it would need to agree with ORR the most appropriate basis for developing its CP5 delivery plan. In particular, it would need to agree the approach for its investment programme so that the impact of any delay could be minimised, whilst recognising that the delay could result in subsequent changes to the agreed programme.

22.43 The responses were consistent with our proposed approach. Shortly after publication of this draft determination, we will write to Network Rail and franchised and open access passenger operators asking them to enter into the amendment to implement the contingency arrangement.

22.44 We will not ask freight or charter operators to do so on the basis that there was insufficient support for this and that their contracts will not 'time-out' in the event of a

[401] These are available on our website at http://www.rail-reg.gov.uk/pr13/consultations/contingency-planning.php.

delay to statutory implementation of PR13. Ultimately, they will still pay the CP5 charges: once PR13 is finally implemented, any difference between the uplifted CP4 rates paid during the interim period and the final CP5 rates would need to be reconciled.

23. Monitoring, enforcement and reporting

Key messages in this chapter

- We will monitor, enforce where necessary and report on Network Rail's performance in CP5. This will give stakeholders assurance it is meeting its obligations and delivering what it has been funded to do.
- Our monitoring will be risk based, proportionate and forward looking. We will monitor a wide range of outputs, indicators, enablers and other aspects of delivery. We will focus much more on route level information than we have done before, for transparency and benchmarking.
- We will enforce the delivery of outputs where we need to. Our approach to enforcement will continue to reflect the principles of better regulation and our enforcement policies. As well as enforcing compliance with Network Rail's licence, we can enforce health and safety law.
- Network Rail must agree operational performance targets with individual passenger TOCs. We will treat these as outputs alongside the national performance outputs. All franchised England & Wales TOCs should reach 90% punctuality by the end of CP5 (and overall punctuality should be 92.5% or more). There are established industry processes by which Network Rail, TOCs and FOCs work together to deliver good performance, but we can intervene if Network Rail falls short.
- We will use our PR13 determination as the baseline for measuring Network Rail's financial performance, and will focus on total financial performance rather than just some elements of expenditure. If Network Rail cannot show us that its reporting is robust it will not be able to benefit from any claimed savings in renewal costs.
- We will continue to publish independent, objective reports about Network Rail's delivery in CP5, including our Network Rail Monitor and our annual letter to Network Rail's remuneration committee. We will publish more information at the route level. We will establish a whole industry scorecard and will develop a new journey time indicator for connectivity. We will discuss possible measures of accessibility with the TOCs and will need to think further on how to make the scorecard useful at the local level.

Introduction

23.1 One of our key responsibilities is to provide assurance to Network Rail's customers and funders that Network Rail is meeting its obligations and delivering what it has been funded to do.

23.2 This involves monitoring, enforcing and reporting on Network Rail's compliance with both health and safety law and with its licence obligations. This chapter sets out our approach to these tasks in PR13. We have considered four particular aspects:

(a) how we will monitor Network Rail's delivery of economic and health and safety obligations;

(b) how we will enforce delivery, especially of operational performance outputs where we need to update our approach;

(c) how we can improve the monitoring of Network Rail's financial performance; and

(d) what we should report, particularly about the whole industry context.

Monitoring in CP5

23.3 In CP5 our monitoring across all areas will continue to be risk-based, proportionate, targeted and forward looking. Where possible we will anticipate and head off issues, ensuring Network Rail is managing risks effectively before they become problems.

23.4 We will monitor whether Network Rail is delivering the **outputs** we set. We will consider all the outputs detailed in chapter 3, including new ones for CP5 such as those around Network Rail's asset management and the reduction of risk at level crossings.

23.5 We will continue to monitor Network Rail's compliance with its obligations under health and safety law.

23.6 We will also monitor:

(a) **indicators** to better understand the reasons for trends in outputs and the risks faced. Many of these are highlighted in chapter 3. For example, we will compare the volumes and costs of work done maintaining and renewing the network against Network Rail's plans. This will be a particular challenge in the case of civil engineering works where we need Network Rail to first develop much better plans for the later years of CP5. Similarly, we will monitor Network Rail's project

design and development milestones as indicators. However, Network Rail has a great deal to do to develop these quickly for the early GRIP projects where a single option has not yet been identified;

(b) where we have established **ring-fenced funds**, whether Network Rail is delivering schemes efficiently and on time and that planned benefits are realised. Schemes may have economic, environmental, social and safety benefits;

(c) if Network Rail is financially sustainable and operating within the financial boundaries set by our determination;

(d) progress with the **enablers** we have identified that underpin longer term improvement. These include customer service maturity and continuous improvement of Network Rail's management of safety; and

(e) the whole industry context in which Network Rail works.

23.7 In CP5 we will be monitoring much more route level information than in CP4. Clearly it is for Network Rail to manage its routes and other business units but we will expect the company to provide disaggregated information wherever appropriate. This will be valuable in helping us understand how Network Rail is performing as a business, the variations in performance, efficiency and safety we see across the network and for benchmarking. It will help us make industry delivery more transparent, and should facilitate greater local involvement in the funding and specification of the railway.

23.8 We will seek to minimise the regulatory burden on Network Rail by using the information it already uses for its own purposes wherever possible. Network Rail is keen to work us with us to facilitate our using its own assurance processes where this will be effective and efficient.

23.9 Longer term, we would like to see the need for ORR to monitor delivery the way we do now to diminish. This might come about as Network Rail becomes more commercial in its behaviour and relationships with greater exposure to what its customers want. In time our role could then shift more towards supporting and encouraging Network Rail and its stakeholders as they work together to deliver. Network Rail's performance in CP4 shows we have not yet reached that position. We will review our approach towards the end of CP5. Until then we will look for opportunities to step back from particular areas of monitoring where delivery and/or the costs and risks justify it.

Enforcement in CP5

23.10 Our approach to enforcement in CP5 will continue to reflect the principles of better regulation i.e. to be proportionate, transparent, consistent, targeted and accountable. We will act in line with our published enforcement policies, which we consider remain fit for purpose in CP5.

23.11 If Network Rail is failing, or is likely to fail, to meet an output we will consider whether to take licence enforcement action. We can do this because we consider outputs to be the reasonable requirements of Network Rail's customers and funders, and its licence requires it to do everything reasonably practicable to meet such requirements.

23.12 If Network Rail is not complying with its health and safety obligations we will consider whether to take enforcement action under health and safety legislation. This may include prosecution and/or the serving of enforcement notices.

Enforcing TOC operational performance

23.13 In the past we have made a separate policy statement on enforcing operational performance at the individual TOC level, most recently in June 2010. Our approach from now until the end of CP5 is set out in this section.

23.14 Throughout CP5 we expect Network Rail to engage with passenger TOCs to develop and agree a Joint Performance Improvement Plan (JPIP) (or alternatively a local output commitment or LOC) to be in place by 1 April each year. Each JPIP should cover the next two years. Each JPIP should include a PPM commitment, and also a CaSL commitment for those TOCs franchised by the Department for Transport. We will treat only these commitments for the first year of each JPIP as regulatory outputs.

23.15 JPIPs should also include performance indicators we will monitor such as delay minutes and any other measures Network Rail and TOCs think appropriate.

23.16 In the event Network Rail cannot agree a JPIP with a TOC we would expect to set an interim requirement taking the second year of the last agreed JPIP as our starting point (for the first year of CP5 this means the second year of the JPIPs agreed this summer). For franchised TOCs we would also work with the relevant franchising authority to ensure the JPIP process worked smoothly and a JPIP was agreed as soon as possible.

23.17 For franchised TOCs, JPIPs should be consistent with the franchise contract so far as possible. Network Rail will, as now, provide performance projections to inform potential franchise bidders and JPIPs should be updated in-year if needed to reflect franchise change.

23.18 Network Rail will need to explain each year how delivery of the individual JPIPs relates to delivery of the required national performance. We expect it to have robust governance arrangements in place so that whenever the JPIPs taken together do not give us confidence the national requirements will be met, it develops clear and convincing plans to bridge any gap, which it must then deliver.

23.19 There are established industry processes through which Network Rail, TOCs and FOCs work together to deliver good train performance. While we can hold Network Rail to account, funders can hold their operators to account and so we will work with the funders to ensure these performance management processes work well. We may step in if called on by an operator, a funder, Passenger Focus or London TravelWatch. We will not, however, wait for a complaint if our own monitoring suggests action is needed.

23.20 Achievement of the national annual output targets will almost inevitably mean that some TOCs will exceed their individual JPIP targets while others underperform. This is particularly likely where the sum of the JPIPs is very close to the national target. This means there is no justification for us to intervene automatically if a JPIP output were not being achieved. However, this would mean that Network Rail could achieve its national outputs while some TOCs experienced significantly worse performance. Therefore, we think we should specify a floor level below which we will intervene. Above the floor, we will not normally intervene unless some other output is at risk (for example, the minimum PPM in year 5 output in paragraph 23.23).

23.21 Network Rail suggested a floor for England & Wales PPM of 90% with no regulatory intervention as long as performance remained above this level. We have not accepted this proposal as there are big differences between individual TOC performance and the nature of their services, and Network Rail is unlikely to agree the same JPIP targets with every TOC.

23.22 Instead we propose to set a floor 2 percentage points below PPM (MAA) commitments made in each JPIP. We think this is an appropriate floor given the

uncertainty in the figures that make up PPM, the greater variability in PPM at individual TOC level and performance in CP4. Similarly where a CaSL commitment is made we propose to set a cap at 0.2 percentage points worse than the JPIP target; below this level we will not normally intervene unless some other output is at risk.

23.23 We consider no England & Wales franchised TOC should exit the control period with a PPM (MAA) of less than 90%. We will treat this requirement as an output and require Network Rail to agree PPM targets in the relevant JPIPs of at least this level for the last year of CP5. This should not significantly impact the CP5 national output as the poorest performing TOCs run relatively few services and therefore have a relatively small impact on national PPM.

23.24 In summary, we will intervene when:

(a) Network Rail and a TOC cannot agree a JPIP;

(b) Network Rail's plans or actions to deliver at least 90% PPM for every England & Wales franchised passenger TOC in the last year of CP5 are inadequate;

(c) Network Rail's plans or actions to deliver the national performance outputs are inadequate (including where Network Rail needs to bridge a gap between the sum of the JPIPs and the national outputs); and/or when

(d) performance for an individual TOC is worse than the relevant floor/cap levels.

23.25 Where we intervene, we will follow a staged approach of review, investigation and escalation which may ultimately lead to formal enforcement action. We may require updated or new recovery plans, the formation of a recovery board or some other form of assurance from Network Rail.

23.26 As now, in deciding whether and how to intervene we will focus on systemic and/or serious issues. We will work with the established industry processes where possible, taking account of how the commitments made dealt with the greater uncertainty associated with forecasts at the route or TOC level.

23.27 We will also consider the impact of poor performance on passengers and what was or will be done for them. In particular, we will look at the numbers, causes and effect of so-called 'bad days' on passengers and assess Network Rail's response; these are days when significant parts of the network are severely disrupted, for example by major infrastructure failure or extreme weather. While some bad days are probably

unavoidable, Network Rail can reduce their likelihood and impact through its planning and service recovery. The CaSL measure captures the key elements of such days – trains cancelled or part cancelled and those delayed by 30 minutes or more.

Financial monitoring

23.28 We report on Network Rail's efficiency and financial performance in our annual efficiency and finance assessment publication[402] and in our Q4 Network Rail Monitor[403]. We also require Network Rail to report on financial issues in its regulatory accounts. This is because it is an important part of our role in holding Network Rail to account to be able to confirm how it is performing financially.

23.29 We have used several measures of efficiency and financial performance in CP4:

(a) a comparison to the PR08 determination;

(b) real economic efficiency measure (REEM);

(c) efficiency benefit sharing mechanism; and

(d) financial value added (FVA).

23.30 The differences in the way these measures are calculated has resulted in complexity and confusion in communicating Network Rail's financial performance in CP4. Given these and other problems, we are considering changing our approach to assessing financial performance in CP5. Our proposals are explained below.

23.31 The issues we have considered are:

(a) the objectives of our financial monitoring;

(b) the definition of outperformance and underperformance;

(c) the CP5 baseline;

(d) whether we should focus on Network Rail's total financial performance or a subset such as support, operations, maintenance and renewals costs;

(e) how we should treat financing costs and input price changes;

(f) how we should treat renewals performance;

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[402] This may be accessed at http://www.rail-reg.gov.uk/upload/pdf/nr_annual_asessment_2011-12.pdf.

[403] This may be accessed at http://www.rail-reg.gov.uk/upload/pdf/network_rail_monitor_1112q4.pdf.

(g) consistency with our RAB roll forward policy;

(h) the effect on financial performance of Network Rail not delivering outputs;

(i) how we should treat material one-offs (for example, if a machine had been assumed to be leased but Network Rail decided to buy it or if there is a change in law such as to national insurance rates); and

(j) how should we present our assessment of financial performance.

Financial monitoring objectives

23.32 Improving efficiency is not an output specified in our PR13 determination. Nevertheless, we make assumptions about what it is reasonable for the company to achieve and it is important that Network Rail is incentivised to financially outperform and to accurately report its financial performance. This is because:

(a) reducing costs, in a safe and sustainable way, is essential if the railway is to provide improved value for money for customers and funders;

(b) in the absence of shareholder pressure, reputational incentives such as our assessments of Network Rail's financial performance are important;

(c) our assessment of Network Rail's financial performance underpins the route-level efficiency benefit sharing mechanism (REBS);

(d) it has links to Network Rail's calculation of management bonuses; and

(e) it reveals important information to inform future periodic reviews.

Definition of financial outperformance and underperformance

23.33 In our 2006 policy statement[404] we defined:

(a) financial outperformance as "any underspend achieved while delivering the output targets specified in the access charges review and not compromising the long-term asset condition and serviceability of the network". The burden of proof is on Network Rail to show that an underspend it claims as outperformance meets the tests below; and

[404] *Monitoring and treatment of Network Rail's underspend and efficiency*, January 2006, available at: http://www.rail-reg.gov.uk/upload/pdf/273.pdf.

(b) financial underperformance as “any underspend while failing to achieve required output targets and/or compromising long-term asset condition”.

23.34 In order to assess whether underspend is outperformance or underperformance we:

(a) identify and quantify the causes of any underspend;

(b) assess whether Network Rail has delivered its required outputs (‘robustness’ test); and

(c) assess whether any reductions in the scope of work (i.e. reductions in volume) are likely to impact on the long-term asset condition and serviceability of the network (‘sustainability’ test).

CP5 baseline

23.35 It is more transparent to use just one baseline for assessing Network Rail’s financial performance in CP5; comparing Network Rail’s financial performance to both our determination and Network Rail’s delivery plan in CP4 has been overly complicated and has worsened transparency.

23.36 For CP5 we propose our financial monitoring should compare Network Rail’s financial performance against our PR13 income and expenditure assumptions. This is because:

(a) it is more transparent;

(b) it better reflects the regulatory settlement that Network Rail is incentivised to deliver;

(c) it better supports efficiency sharing mechanisms which are underpinned by the financial assumptions in our determination; and

(d) reporting against our determination will restrict Network Rail’s ability to potentially move the goal posts through frequent large-scale changes to its delivery plans.

23.37 Given the lack of a clear causal link between inputs and outputs, judgement needs to be applied in our assessment of financial performance. However, the more detailed the cost and volume baseline data that we can base our determination on, the more accurate our reporting will be. Given that the assumptions underpinning our determination will probably be less detailed than Network Rail’s own business plans, we will need to be transparent to ensure that Network Rail understands the basis of our determination.

23.38 This problem would not be solved by using Network Rail's business plans as the baseline. The lack of detailed unit cost and volume baseline data in Network Rail's plans has been a problem in CP4 and we note that its PR13 SBP maintenance assumptions were not based on volume and unit cost information[405].

23.39 The baselines included for early GRIP enhancements projects will be determined at the end of 2014-15 following our review of the costs of these projects.

Network Rail's total financial performance

23.40 Our assessment of financial performance in CP4 has mainly focused on Network Rail's operating, maintenance and renewals (OM&R) expenditure. However, focusing on OM&R can lead to perverse incentives. For example, an information management scheme that increases Network Rail's income and is efficient would reduce our assessment of Network Rail's efficiency as our assessment would only take into account the increase in cost, not the reason for the increase in cost, and not the increase in income.

23.41 Therefore we are proposing to include all income and expenditure categories that we have assumed are controllable by Network Rail in our determination in the measurement of total financial performance. This would address such perverse incentives, better incentivise Network Rail to improve its efficiencies in areas other than OM&R and reduce confusion amongst stakeholders[406]. For the final determination we will need to decide how our revised approach to issues such as civils, early GRIP enhancements and investment framework/spend to save projects should be reflected in our approach to financial performance. We will discuss this further with Network Rail and other stakeholders in the summer.

23.42 As summarised in the diagram below we think it will help in presenting our assessment of Network Rail's financial performance to structure it as follows:

(a) first, we will identify all variances between Network Rail's total actual income and expenditure compared to our determination. This provides a simple analysis of income and expenditure and we do not distinguish between a deferral of work and a cost saving;

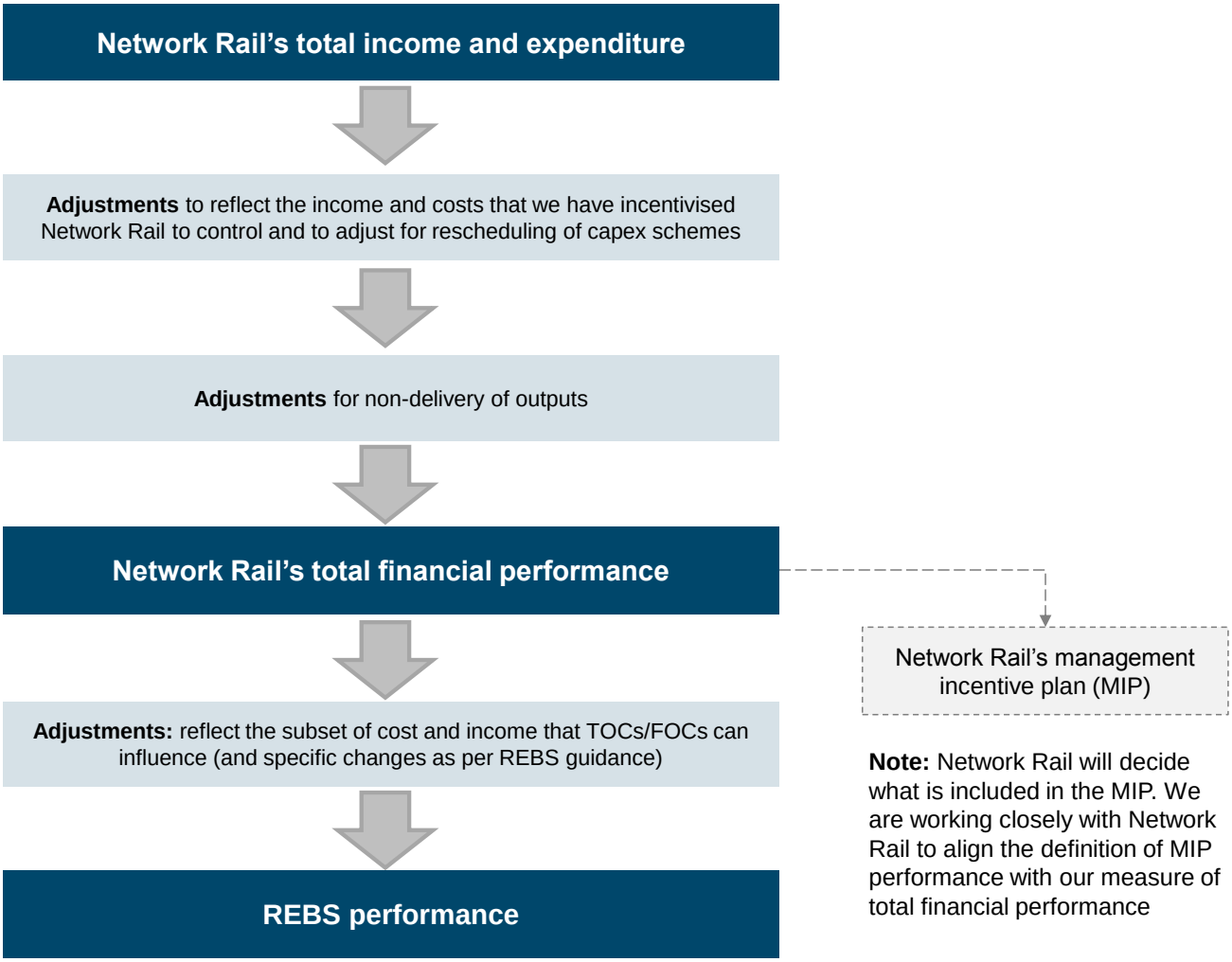
[405] Important though Network Rail's delivery plan is, it is not a substitute for our determination.

[406] The concept of total financial performance is similar to Financial Value Added (FVA) which Network Rail developed in CP4 as a measure of financial performance against its 2009 delivery plan for CP4.

(b) second, we will identify the reasons for the variances in income and expenditure and what Network Rail's total financial performance has been. This will mean that we will not include a rescheduling (e.g. deferral) of renewals spend as financial outperformance but we would include a sustainable change in the scope of renewals work as outperformance. This will also involve us assessing whether Network Rail has delivered the under/over spend in accordance with our determination and our regulatory accounting guidelines (RAGs), e.g. has it met its required output targets and maintained the long-term asset condition of the network in accordance with its licence and our determination; and

(c) then we decide how that total financial performance should be reflected in the REBS mechanism.

Figure 23.1: Calculating REBS performance



The treatment of interest costs and input price changes

23.43 Changes to Network Rail's interest costs and input prices can have a significant effect on Network Rail's total financial performance. As we consider these to be controllable issues we are proposing they should be included in our measure of total financial performance.

23.44 The advantage of including interest costs and input prices in the total financial performance measure is that it incentivises Network Rail to manage them efficiently and is consistent with our approach to risk and uncertainty. However, the disadvantage is that this may appear to reward Network Rail for factors that may to some extent be outside of its control. For example, Network Rail's interest costs are sensitive to changes in market interest rates.

23.45 To better inform stakeholders about Network Rail's total financial performance we are proposing that in addition to comparing interest costs to the PR13 determination we should also compare them to market rates in our supporting analysis. This would enable stakeholders to understand better the reasons for Network Rail's performance.

The treatment of renewals financial performance

23.46 Our assessments of Network Rail's financial performance for renewals expenditure have been difficult in CP4 for a number of reasons including:

(a) uncertainty about the sustainability of Network Rail's asset management policies, in particular for its civils assets;

(b) Network Rail's failure to deliver outputs, in particular for performance;

(c) significant levels of variability in projected renewals volumes and costs in delivery plans compared to actual volumes and costs, implying instability in the renewals delivery process; and

(d) lack of auditable evidence to justify that underspend was efficient.

23.47 Given these issues we need to consider whether all renewals scope (i.e. volume changes) and unit cost savings should be included in total financial performance. The main options that we are considering are:

(a) include all renewals. This approach would provide Network Rail with the strongest incentive to improve efficiency;

(b) include only some aspects of renewals spend. This approach would allow us to de-scope cost savings which are contentious, for example volume/scope savings which are more likely to affect the long-term sustainability of the network and are hard to measure; and

(c) exclude all renewals. This approach to renewals savings would reflect our concerns over Network Rail's reporting of renewals savings in CP4.

23.48 Given that in PR13 we are incentivising Network Rail to be more efficient, we are proposing that all renewals spend should be included in the scope of financial performance. The advantage of this approach is that it provides the greatest incentive on Network Rail to make savings. However, the disadvantage is that as sustainable scope savings are difficult to measure, this approach increases the risk of recognising deferral of necessary work as financial outperformance.

23.49 Therefore, we will require Network Rail to provide robust supporting evidence to demonstrate the sustainability of renewals savings and to have a reporting system in place that will robustly identify out/under performance.

23.50 Therefore, before we allow an aspect of Network Rail's activities to be included in our definition of total financial performance, we propose to require Network Rail to have:

(a) successfully implemented a package of improvements on asset management, e.g. capability, asset policies, asset register, data quality, condition reporting and unit cost information;

(b) an efficiency should be justified by positive management actions and Network Rail should be able to explain how its new approach is consistent with the delivery of its required outputs and its health and safety obligations, is sustainable in the short, medium and long-term and is consistent with whole-life cost minimisation; and

(c) achieved a minimum confidence grade on its reporting of those costs.

23.51 We are working with Network Rail to define what it will need to achieve to meet these requirements and by when it will need to achieve them.

23.52 The burden of proof will still be on Network Rail to show that its performance has been efficient, that it has met its outputs and that its financial performance is sustainable[407].

Consistency with the RAB roll forward policy

23.53 In CP4 if Network Rail outperforms its renewals expenditure target by £100, we recognise the full £100 saving when calculating financial performance. However, our RAB roll forward policy allows Network Rail to keep only £25 of the saving as the risk of out/under performance is shared between Network Rail and its customers and funders. We have retained this approach to the RAB roll forward for CP5. This means that there will be a difference between the amount of money that Network Rail out/under performs by and how much of that money it retains/bears.

[407] Due to the separate treatment of renewals of civil structures in PR13 we will not recognise any underspend on volumes of renewal of civil structures in CP5 for financial performance purposes.

23.54 When measuring financial performance we therefore need to consider whether we include the efficient underspend fully as outperformance, i. e. in the above example do we include the £100 or the £25?

23.55 The approach we used for CP4 reflected our objective of making the EBSM as straightforward as possible. However, it is not consistent with the reward Network Rail receives through the RAB roll forward policy. For example in the EBSM it would have to pay TOCs/FOCs £25, which would mean it would keep £0 for a renewals saving.

23.56 However, REBS is a more commercial approach and we need to ensure that the incentive on Network Rail is appropriate in CP5. Therefore for CP5 we are proposing that our definition of financial performance should be consistent with our policy for rolling forward the RAB, in particular the treatment of logging up or down under/overspend on renewals and enhancements expenditure. Using the above example we would include £25 as outperformance.

23.57 The advantage of our proposed approach is that it aligns Network Rail's financial reward/penalty for renewals and enhancements expenditure (through the RAB roll forward mechanism) with the basis for calculating REBS payments. This should improve the incentive on Network Rail to make REBS work.

23.58 The disadvantage is that it makes it harder to understand how the financial performance underpinning REBS payments has been calculated, as REBS payments will not be based on the cash saving. We will hold a workshop on setting REBS baselines with the industry ahead of our final determination. One of the issues we will discuss is whether taking this approach to calculating financial performance would overcomplicate REBS.

Effect of Network Rail not delivering its regulatory outputs

23.59 In CP4 we adjust Network Rail's financial performance to reflect failures to deliver its regulatory outputs. For CP5 we think that there are two main options:

(a) hurdle approach: Network Rail cannot outperform financially if it does not meet all (or materially all) outputs; and

(b) adjustment approach: we adjust Network Rail's financial performance to reflect the impact of not delivering outputs.

23.60 The advantage of the hurdle approach is that it sends a very clear message to Network Rail about the significance of delivering its outputs. However, it may incentivise Network Rail to invest in uneconomical initiatives to achieve this. Network Rail opposes the hurdle approach because it does not recognise the company's need to balance different requirements.

23.61 The advantage of the adjustment approach is that it is consistent with Network Rail being able to make decisions about trade-offs between delivering its outputs and providing value for money to customers and funders. This is the approach we use in CP4.

23.62 Given the perverse incentives that could exist with the hurdle approach, we are proposing to continue to use the adjustment approach.

Treatment of one-offs and other changes

23.63 Material one-off changes to Network Rail's income and costs can distort the assessment of Network Rail's financial performance. So we need to consider how to treat them. Material one-offs could include:

(a) one-off changes in costs, e.g. changes in tax law, such as an increase in national insurance contributions; and

(b) a decision by Network Rail to buy an asset rather than to lease it.

23.64 In order to be consistent with the rest of the financial framework and in particular our approach to risk and uncertainty, we think that our assessment of Network Rail's financial performance should reflect our PR13 financial framework, i.e. if we consider that a cost is controllable, all changes in that cost should be included in financial performance. This would include material one-off changes.

23.65 The issue of how to treat a buy/lease decision is a similar issue to the issues involved with spend to save schemes, i.e. we do not want to incentivise Network Rail to take inefficient decisions. Therefore, both our RAB roll forward policy and our assessment of financial performance should hold Network Rail neutral to such changes and not provide Network Rail with perverse incentives. This is discussed further in the RAB roll forward section of chapter 12.

Presentation of our assessment of financial performance

23.66 It is important that we present our assessment of Network Rail's financial performance in as easily understandable a way as possible. The two main ways of doing this are:

(a) use the PR13 determination as the CP5 baseline; and

(b) report on total financial performance instead of focusing on support, operations, maintenance and renewals. This should also help to present a more rounded and balanced assessment.

23.67 Also, reporting on a single total performance measure in monetary terms (i.e. £m) rather than reporting efficiency savings in percentage terms, should also help inform stakeholders as efficiency savings presented as a percentage can be misleading as the materiality of the saving is not clear. However, we recognise that it is useful to have a time series of efficiency data available, so we will continue to publish information in our supporting documentation showing the percentage improvement in the efficiency of support, operations, maintenance and renewals expenditure.

23.68 We will also provide other information in our annual assessment such as unit cost movements and we are planning to report on financial performance at an operating route level.

23.69 More technical issues with the way we present Network Rail's financial performance include:

(a) Network Rail in its SBP, presented its CP5 efficiency proposals on a net basis (i.e. net of traffic growth). We think it is more understandable to present Network Rail's financial performance on a gross basis; and

(b) in its SBP some of the efficiencies Network Rail will deliver in CP5 are embedded in its pre-efficient assumptions as they are the result of a change in asset policy. We have removed these from our pre-efficient assumptions and included them instead in our assessment of efficiency.

23.70 How we present our assessment of Network Rail's financial performance will be set out in our RAGs which we will publish in December 2013.

23.71 We would welcome comments on our financial monitoring proposals.

Reporting

23.72 In CP5, we will continue to publish overall assessments of Network Rail's delivery of outputs and its financial performance at least annually. This will include our Network Rail Monitor and our annual letter to Network Rail's remuneration committee. We will also publish an annual report about health and safety across the industry, including Network Rail.

23.73 By providing objective, clear and reliable information we will help Network Rail's customers, members and other stakeholders to better understand its performance, help to drive improvements and hold it to account.

23.74 As in CP4 we will continue to publish summaries of any audit reports we commission on aspects of Network Rail's delivery (or the full document where possible). But we will also publish more information about Network Rail's performance at the individual route level.

Whole industry scorecard

23.75 In our outputs consultation we proposed to establish a whole industry scorecard for CP5. This would allow us to report Network Rail's progress in the context of progress against the outcomes we want to achieve and wider industry trends.

23.76 We gave an example of how such a scorecard might be structured and asked for views and suggestions.

23.77 The idea was received positively, with widespread support. No alternative structures were proposed. Some cautionary points were that the scorecard should not be a focus in itself and it should be simple and easy to understand, but a 'traffic light' approach should be avoided as that would be too simplistic. There was a view that the work to establish a scorecard should be outside of our PR13 work to avoid distracting from priorities.

23.78 The themes were:

(a) data should be drawn from that already in the public domain - no new burdens should be created to provide data (DBS, FirstGroup, Network Rail);

(b) measures that are outside of the industry's direct control, or were seen as providing little value, should not be included - e.g. connectivity, a GDP-related measure, accessibility (ATOC, FirstGroup, TfL);

(c) the scorecard should be capable of disaggregation to a local level (Centro, Merseytravel, Nottingham City Council, Transport Scotland);

(d) an accessibility measure should be included (London TravelWatch, RMT); and

(e) a safety measure should be included (Go-Ahead Group, RMT).

Our view

23.79 In view of the clear overall support for a whole industry scorecard we will, as proposed, establish a template for CP5 using either the same structure we suggested (in Table 23.1) below or one similar to it.

Table 23.1: Whole industry scorecard: Great Britain, England & Wales and Scotland

Output framework					
Outcomes	Passenger satisfaction	Freight market share	Support for the economy	Connectivity	Direct greenhouse gas emissions - traction energy
Measure	% [408]	%	No single measure - but read-across from 'Industry finances' and 'Connectivity'	Number of services timetabled [409]	grams CO_2: per passenger km and per net freight tonne
Current frequency of availability	6-monthly	annual	-	-	annual
Volumes	Passenger journeys	Passenger km	Freight tonnes lifted by market	Freight net tonne moved by market	
Measure	number [410]	km	tonnes	tonne km	
Current frequency of availability	quarterly	quarterly	quarterly	quarterly	
Supply	Passenger train km	Passenger vehicle km	Freight train km	Freight vehicle km	
Measure	km	km	km	km	
Current frequency of availability	4-weekly	annual	annual	not currently available [411]	
Industry finances	Ticket revenue	Freight revenue	Other revenue	Costs	Subsidy
Measure	£ million	£ million	£ million	£ million	£ million
Current frequency of availability	quarterly	quarterly	annual	annual	annual

[408] Potential sub-measure for scores at major stations.

[409] Potential joint measure for journey time indicator.

[410] Potential sub-measures for '*Passenger Assist*' bookings and/or *Disabled Persons Railcard* as accessibility indicators.

[411] Held in Network Rail's billing systems but not currently reported.

23.80 We already receive most of the data a scorecard would need. We agree with views that the scorecard should not add any regulatory or administrative burden and where further data is needed beyond what we already collect, we will only use data that is already collected elsewhere. For 'passenger vehicle km' and 'freight vehicle km', this would mean asking Network Rail to extract and report data it holds in its billing system.

23.81 There are difficulties with obtaining data for the 'Support for the economy' indicator. Railway-related activity supports the economy in many ways, both directly and indirectly. For example, workers commuting by train contribute positively to the economy - a good outcome. However, attempting to calculate the effect on the economy as if we had no railway would be impracticable. Some respondents suggested that we omit a GDP-growth indicator as it would rely on non-railway factors and would add little value. We can, however, take the revenue data indicators captured in the 'industry finances' section of the scorecard to provide some indication of support.

23.82 There were also some views that an indicator for 'Connectivity' would rely on others outside the rail industry and it would add little value. However, a way of dealing with this would be to use the number of timetabled passenger services as a simple and straightforward indicator of connectivity. It would also contribute to the 'Support for the economy' picture.

23.83 For connectivity, we are also considering having a 'journey-time' indicator. We will work with Network Rail and Transport Scotland to develop a suitable measure, reflecting the Scottish Ministers' particular concerns set out in their HLOS.

23.84 The inclusion of an accessibility metric was suggested by two respondents with another in opposition. The latter argued station accessibility data would require collection by infrastructure managers but they would not own it, creating a burdensome 'post office' role. We think that ATOC's data for Passenger Assist booking requests and/or sales of the Disabled Persons Railcard could, as alternates, show how accessible the railway network is becoming. For example, if Passenger Assist bookings were to decline while sales of Disabled Persons Railcards increased this might indicate the network was becoming more accessible. We will discuss with ATOC the availability of its data as an accessibility indicator.

23.85 There have been improvements in safety risks to passengers and workers during the last five years and both we and the Secretary of State want to see further continuous improvement. Although we do not intend to include a safety-related indicator in the scorecard, we will continue to monitor and report on Network Rail's compliance with its health and safety obligations, implementation of its safety strategy and its safety management maturity throughout CP5.

23.86 As proposed, the scorecard has 17 categories, seven of which require data which are only available annually. We therefore intend to publish the scorecard annually, probably in our end-of-year *Network Rail Monitor* given our intention of placing Network Rail's performance in a wider industry context.

23.87 The scorecard appears to be most useful in a national context although disaggregating by funder, region, route or train operator is desirable, as noted by regional funders. However, beyond 'funder' level, the data does not always appear to be sufficiently granular to be robust or add real value. This makes one single structure for a scorecard difficult to achieve and we will need to consider what approach to take if it is to be used at a very local level.

24. Review of wider impacts

Key messages in this chapter

- In reaching our decisions, we have had regard to the impact of our determination on those groups that will be affected by it.
- The impacts are caused by the effects of our decisions on outputs such as train service reliability and enhancement projects. But the impacts also come about through our decisions on financial incentive mechanisms, which often affect the whole industry.
- Overall, our determination will deliver significant benefits for passengers, freight customers, passenger and freight operators, taxpayers and funders. These benefits come mainly through the improvements to the network to be delivered by Network Rail and the reduction in its revenue requirement.

Introduction

24.1 Elsewhere in this document we have set out our assessment of the impact of our determination on Network Rail and on rail safety. We have also discussed the impact on the UK and Scottish governments in terms of the delivery of HLOS requirements for the money available.

24.2 This chapter sets out our assessment of the wider impact of the proposals on:

(a) passengers;

(b) passenger train operators;

(c) freight customers;

(d) freight train operators;

(e) geographic areas in Great Britain;

(f) the railway supply chain; and

(g) local, regional and devolved funders of the railway.

24.3 We have had regard to the relevant wider impacts in reaching our decisions on the overall package.

24.4 Under the Equality Act 2010, ORR is required, when exercising its functions, to have due regard to the need to:

(a) eliminate discrimination, harassment, victimisation and any other conduct that is prohibited by or under that Act;

(b) advance equality of opportunity between persons who share a relevant protected characteristic and persons who do not share it (relevant protected characteristics are – age; disability; gender reassignment; pregnancy and maternity; race; religion or belief; sex; sexual orientation); and

(c) foster good relations between persons who share a relevant protected characteristic and persons who do not share it.

24.5 We have concluded that the relevant impacts and potential impacts of this review relevant to this duty principally concern the effect on passengers. Our assessment of these is set out below.

24.6 We welcome comments from stakeholders on this chapter.

Overview of impacts

Passengers

24.7 As part of the review we have undertaken a considerable amount of work to understand what matters to passengers. This has included in-depth discussions with Passenger Focus and London TravelWatch about Network Rail's SBP. We have also drawn on our wider work beyond the specific scope of the review, for example, our work looking at passengers' experience of buying tickets, working with train operating companies to understand how they handle complaints and deal with passengers more generally, and working with our consumer expert panel.

24.8 We have taken into account the work that Passenger Focus has done to understand passenger views, most notably in the National Passenger Survey but also through more focused research. We have had regard to the priorities that Passenger Focus's research has indicated that passengers value the most in those areas which we are able to influence through our periodic review. These are value for money, punctuality,

reliability and there being sufficient train services at the time passengers want to use them[412]). Our determination takes account of these passenger priorities as follows:

(a) providing extra capacity to accommodate growth and provide new and improved journey opportunities. Major projects such as the Great Western upgrade, Crossrail, Thameslink, the Edinburgh-Glasgow improvement programme and Northern Hub will be key to this, alongside a large number of smaller scale capacity enhancements;

(b) the criteria for governance of the ring-fenced investment funds which will explicitly include securing passenger benefits. This builds and improves on the arrangements in place for CP4 and should provide greater focus on the needs of passengers, with their representatives having a greater say in the selection of projects to be funded. We will also be monitoring the benefits delivered to passengers through the ring-fenced funds to ensure that these are used properly;

(c) for those enhancement schemes that are at an early stage of development (see chapter 9), the process for confirming the detailed scope of each project will include specific provision for train operator input on behalf of passengers;

(d) improving levels of train service reliability despite the major programme of renewal and enhancement, and requiring improvement on the current worst performing services with every franchised train operator in England & Wales reaching 90% of trains on time (as measured by PPM) by 2019. This will benefit those who travel with those operators currently below 90% PPM;

(e) a reduction in levels of train service disruption due to engineering works despite the scale of the investment programme. We recognise that this is a particular concern of passengers through Passenger Focus's research;

(f) ring-fenced funds providing for continued investment in station enhancements. This includes around £100m specifically earmarked for further improvement in accessibility for disabled passengers and others with reduced mobility in England & Wales, and part of the £30m Scottish Stations Fund for this purpose

[412] *Passengers' priorities for improvements in rail services*, Passenger Focus, available at http://www.passengerfocus.org.uk/media/f0f44dda1a6af4f3c8940c7623b57102d9783155/rail_priorities_for_improvement.pdf.

in Scotland. We have retained the Station Stewardship Measure relating to the overall condition of stations as an output requirement for Network Rail to deliver;

(g) the passenger journey time fund, which will improve journey times on routes in England & Wales;

(h) specifically for the East Coast Main Line there will be ring-fenced funding to reduce journey times and increase capacity;

(i) the funding for Network Rail's operating strategy should facilitate improvements to passenger information during disruption;

(j) our proposed improvements to the volume incentive, under which Network Rail benefits financially from increased rail usage, will give the company a stronger incentive to work with train operators to improve service levels for passengers; and

(k) the overall package, including in particular the proposed approach on asset management, will improve the reliability and quality of the railway over the longer term, including its resilience in the face of climate change.

24.9 In considering the implications of this review for our equality duty, we have taken the view that all passengers will benefit from many of the improvements. However there will be specific benefits in respect of the protected characteristics of age, disability and pregnancy and maternity. These will arise particularly from improved accessibility at stations from the specific ring-fenced funds required by the HLOS and also the schemes which will facilitate introduction of new more accessible rolling stock.

24.10 The increase in payment rates in the Schedule 4 and 8 possessions and performance regimes will strengthen the financial incentives on Network Rail to plan and deliver engineering work efficiently and more quickly and to improve performance. This will benefit passengers through a reduction in planned and unplanned service disruption. This is because Network Rail will have to pay more compensation for each possession it arranges, or minute of lateness it causes. There will also be a reduction in the compensation that train operators receive through Schedule 4 for the cost of operating replacement bus services. This will reduce the risk that train operators agree to possessions which involve the use of replacement buses without having fully explored whether alternative timetable solutions are available which cause less disruption to passengers.

24.11 We will be publishing more information of interest to passengers on the quality of their train services, through an extended range of published indicators, including for example, the impact of engineering works on passengers. This will better enable passengers and their representatives to understand what is being delivered and seek improvement.

24.12 Through including the National Passenger Survey measures of overall satisfaction as an indicator in our output framework, we will monitor the impact of our determination on passengers. More specifically we are reviewing how to measure the benefits to passengers (including those with protected characteristics) that are delivered through improvement projects.

24.13 In terms of what this means for passenger fares, we do not regulate these. Network Rail's revenue requirement is funded through access charges paid by train operators and network grant paid direct by the governments. It is for DfT and Transport Scotland, as the franchising authorities, to decide the balance between fares and taxpayer subsidy and to regulate fares for franchised train operators (open access passenger operators set their own fare structure).

24.14 However, Network Rail's revenue requirement is reducing compared to PR08 which means that access charges and network grant will be lower. In terms of the like-for-like costs of operating, maintaining and renewing the existing network (including support costs), there will be a reduction of around £2bn compared to PR08.

Passenger train operators

24.15 Under our proposals, franchised and open access passenger train operators will benefit from the improvements that their customers will receive, as outlined above. In addition, they will benefit from:

(a) the improved approach to joint performance planning (where Network Rail work with train operators), which should better reflect the needs of train operators in terms of local opportunities and constraints;

(b) the incentives to work together with Network Rail to improve the efficiency and delivery of the railway (such as through our REBS mechanism discussed in chapter 19) and where appropriate to develop alliances to drive out efficiencies that Network Rail, acting alone, may not achieve. For franchised operators, this is particularly important because their franchise agreements (regulated by their

franchising authority) currently limit the extent to which they are exposed to changes in charges made at a periodic review. This blunts the incentive effect of the changes we make, limiting cost-reflectivity and the inducement on train operators to work with Network Rail to reduce its costs. However, the new REBS mechanism we are introducing will provide an incentive for those franchised train operators that participate in REBS to work with Network Rail to identify sustainable efficiencies that can be made in the running of the network. TOCs will then be able to share in the financial benefits arising from this;

(c) the incentives to work together with Network Rail to improve specification and effectiveness of the enhancement programme through the enhancements efficiency benefit sharing arrangements set out in chapter 9;

(d) the improvements to the volume incentive that will encourage Network Rail to take a more commercial approach to managing network capacity. This should enable more services to be operated on the network and for train operators to increase their revenue; and

(e) for open access operators, we will shortly be consulting on proposals for increasing the opportunities for competing with franchised train operators in return for open access operators bearing higher charges as a contribution to Network Rail's fixed costs[413].

Access charges

24.16 On average, PR13 will have very little impact on the variable charges paid by passenger train operators. The impact will however vary between different types of vehicle. But, overall, for both franchised and open access operators, average variable charges will increase by around 1%. Chapter 16 sets the background to this out in further detail.

Schedules 4 and 8 possessions and performance regimes

24.17 The increase in traffic on the network and revenue, and updated evidence on the sensitivity of passenger demand to disruption, mean that the financial impact of possessions and lateness on passenger operators has increased. This is reflected in the draft CP5 Schedule 4 and 8 payment rates. This means that train operators will be

[413] This will be published shortly after this draft determination and will be available at http://www.rail-reg.gov.uk/pr13/consultations/index.php.

better protected against the risks around Network Rail's performance and possession management.

24.18 Conversely, passenger operators will face greater Schedule 8 risk around the impact of their own performance on other train operators. This will have a greater impact on passenger operators whose services have a greater interaction with those of other operators. Ultimately, this is a risk that train operators can control. Overall, we expect the benefit of the additional protection from the increase in Schedule 4 and 8 payment rates to outweigh this risk.

24.19 Changes to Schedule 8 for open access passenger operators are the same in structure as for franchised passenger operators. Open access passenger operators will benefit from increased Schedule 4 payment rates when there are very long possessions or sustained disruption.

24.20 For charter passenger train operators we estimate that, overall, the package we plan to introduce in relation to Schedule 8 and the capacity charge will result in them being, on average, slightly better off than they are currently, but this will depend on the final capacity charge payment rate that we determine. We will be further refining our analysis, and discussing our planned package with charter operators and Network Rail between now and our final determination, as discussed in chapter 19.

Freight customers

24.21 Our latest survey of potential and existing freight customers, which we plan to publish later this year, indicates that the priorities for freight customers in the domestic market are price, followed by service quality (e.g. punctuality) and then access to the mainline network. Under our determination freight customers will benefit from:

(a) continued enhancement of the railway's capability to carry freight, particularly through continued investment in the Strategic Freight Network. Freight customer representatives will be actively involved in planning this;

(b) freight train performance tracked through a new measure which is more transparent and better meets customer needs;

(c) reduced service disruption due to engineering works; and

(d) as above, the improved incentives we are putting on Network Rail to take a more commercial approach to capacity. This should enable more services to be operated on the network.

24.22 Chapter 16 sets out more fully the impact of our determination on access charges paid by freight operators. Overall, in real terms, average freight charges are set to increase by around 21% on current levels by 2018-19, equivalent to 4% a year on average. For commodities not affected by the freight specific charge (i.e. everything other than ESI coal, spent nuclear fuel and iron ore), the corresponding increases are, on average, 5% on current levels by 2018-19 and 1% a year over CP5.

Freight train operators

24.23 Freight train operators will benefit from the improvements that their customers receive as discussed above. They will also benefit from:

(a) the incentives to work together with Network Rail to improve the efficiency and delivery of the railway, through our REBS mechanism. As for passenger operators, this will provide for FOCs to benefit financially where they work with Network Rail and deliver efficiencies that outperform our expenditure assumptions;

(b) the incentives to work together with Network Rail to improve specification and effectiveness of the enhancement programme through the enhancements efficiency benefit sharing arrangements set out in chapter 9; and

(c) the development of better measures of Network Rail's performance in planning and timetabling the network (its 'system operator' role) will help address a particular area of concern to freight operators such as how it plans engineering work and effective management of interfaces between different devolved routes and with adjoining networks.

Access charges

24.24 The access charges paid by freight operators are discussed under freight customers above.

Schedules 4 and 8 possessions and performance regimes

24.25 We have updated Network Rail's Schedule 8 benchmark as part of PR13. Schedule 8 is expected to be financially neutral during CP5 (i.e. net payments of zero), if Network Rail and freight operators perform in-line with our expectations.

24.26 The Schedule 8 freight operator payment rate, which reflects the average impact of a minute of delay caused by a freight operator to another train operator, will increase for CP5. This is as a result of the increase in the passenger Schedule 8 Network Rail payment rate. While we expect net payments to be zero across freight operators as a whole, this rise increases the financial risk that freight operators face in relation to delays they cause to other trains.

24.27 We expect freight operators to benefit from the bonus payment rate being changed so that it is 100% of the compensation payment rate (as opposed to 50%). This will give them more certainty over the impact of improvements they make in their performance in respect of the Schedule 8 payments they make during CP5. It will also help ensure that Schedule 8 remains financially neutral if performance is at the expected level over each year as a whole.

24.28 Unlike franchised passenger operators, freight operators do not pay an access charge supplement to cover the expected cost of Schedule 4 compensation. There is also no Schedule 8 benchmark for cancellations. Instead freight operators receive compensation for cancellations caused by Network Rail or other train operators. Network Rail receives funding to cover the expected cost of both these elements of Schedules 4 and 8.

24.29 Schedule 4 payment rates will remain the same as in CP4 in real terms, so freight operators will be no better or worse off.

Geographic impacts

24.30 The geographic impacts of our determination relate principally to the large programme of enhancement projects being funded through this determination. This will boost capacity and the capability of the network and bring substantial benefits to train operators, passengers, freight customers and the national economy. The decisions on these projects reflect the requirements of the governments' HLOSs. Further detail on these schemes is set out in chapter 9. However, those areas that will particularly benefit are set out below.

(i) In the south east of England, Thameslink, Crossrail and East-West Rail will provide new journey opportunities and better travelling experiences for passengers.

(ii) The north of England will benefit from the North West electrification programme and the Northern Hub, a substantial set of capacity and journey time improvements between Manchester, Sheffield, Preston, Leeds and Bradford.

(iii) A major programme of electrification, representing around 30% of enhancements expenditure, covers a significant portion of Great Britain, including Edinburgh-Glasgow, Manchester – Leeds-York, London – Bristol – Cardiff – Swansea, Welsh Valleys and London to Sheffield. These electrified routes will allow new or cascaded electric rolling stock to replace the current diesel trains. These will be quieter, pollute less and offer better acceleration and breaking, reducing journey times on many routes.

(iv) Scotland will also benefit from the Borders Railway project which will connect Edinburgh through Midlothian to Tweedbank for the first time since 1969. There are also journey time improvement schemes that cover Aberdeen to Inverness and the Highland Main Line. As well as being electrified, the Edinburgh-Glasgow route will benefit from capacity improvements to allow longer trains and faster journey times.

24.31 There will also be improvements to safety, particularly through a reduction in the risk of accidents at level crossings through the £67m ring-fenced fund made available by the Secretary of State. Whilst not specifically for safety improvements, Scotland will also benefit from a £10m fund to provide for closing crossings. These funds will benefit those using level crossings and those using the railway. The level crossings this will apply to will be decided through the governance arrangements to be established for these funds.

24.32 The whole investment package will support economic growth and facilitate improved business, commuter and leisure journeys. It will also provide a greener transport option than road and aviation, and help relieve congestion on the road network.

Suppliers

24.33 The key benefits for the railway supply chain of our proposed determination concerns its ability to plan:

(a) within CP5, where we have confirmed funding for Network Rail's renewal programme and a large part of the enhancement programme. To the extent that

we have not been able to confirm this funding (for the full programme of structures renewals and for those parts of the enhancement programme still at an early stage of development), we have set timescales within which we expect the projects to be developed. We have made clear that we expect Network Rail to develop its CP5 delivery plan in parallel with responding to this draft determination, and that this plan must be published before the start of CP5, following consultation. This should reduce the risk of a discontinuity in orders early in CP5, as happened in CP4;

(b) beyond CP5, more effective whole-life asset management should enable greater long-term certainty of renewal requirements. The funding allowed for longer term planning and project development should enable early development of plans beyond 2019;

(c) we have authorised Network Rail to develop CP5 projects now in CP4, to ensure there are no undue delays in CP5;

(d) our proposals on research and development should facilitate more effective working between suppliers and Network Rail in this important area; and

(e) suppliers will be involved in the planning of enhancement projects and helping to drive greater value for money, particularly in those projects that have not yet been developed to GRIP 3 level.

24.34 We believe the proposed package as a whole gives Network Rail strong incentives to work with its supply chain to improve longer term value for money on the railway.

24.35 The new measure of programme management capability we are developing with Network Rail should lead to closer and more effective working with the supply chain.

Taxpayers

24.36 Our determination will deliver significant benefits for taxpayers. It will:

(a) facilitate sustainable economic growth and improved competitiveness through better connectivity for commuters, businesses, communities and the carriage of freight; and

(b) provide better environmental outcomes from reduced emissions and carbon savings, particularly through electrification and from the improvements to the network facilitating the transfer of road to rail.

24.37 As discussed previously Network Rail's revenue requirement is falling compared to PR08, which, other things being equal, reduces pressure on the public purse.

24.38 Taxpayers will also benefit from the changes to Schedules 4 and 8 possessions and performance regimes that protect train operators against the risk around Network Rail's performance and possession management, which they cannot control. This should help keep down the risk premia factored into franchise bids, or negotiations over extensions, reducing the consequential costs to taxpayers.

Local, regional and devolved funders

24.39 The main focus of our review as far as funders are concerned has been on the primary funders – the UK and Scottish governments. The proposed determination does, however, have significant benefits for other funders such as the Welsh Government, passenger transport executives in the English city regions, Transport for London and local authorities. In particular they will benefit from the range of improvements to the network such as electrification of the Valley Lines in Wales, the Northern Hub, Crossrail and Thameslink.

24.40 We will build on the decentralisation of Network Rail to improve transparency of costs and subsidy at local level. This should provide better information for decision making, and facilitate greater local involvement in the specification and funding of services and of enhancements to the railway.

Monitoring of impacts

24.41 We will monitor the impact of the determination on the above groups, including:

(a) for passengers, through our monitoring of the indicators we are putting in place, through continuing engagement with Passenger Focus and London TravelWatch, and bespoke research;

(b) for freight customers, by continuing to carry out regular freight customer satisfaction surveys and engaging with the freight sector to monitor the impact of our determination on freight users;

(c) for train operators, through our continued focus on Network Rail's customer satisfaction surveys and the new measure of customer service maturity, and through continuing dialogue with train operators and owner groups;

(d) for suppliers, through further engagement with industry representatives including the Railway Industry Association (RIA) and the Civil Engineering Contractors' Association (CECA). We will use supplier perception surveys (both these carried out by Network Rail and those carried out by organisations such as RIA) to monitor the impact of our determination on the supply chain. If satisfaction levels dropped, we would want to understand the reasons for this; and

(e) for local, regional and devolved funders, through our dialogue with key stakeholders, including the Scottish and Welsh governments, the Local Government Association, Transport for London, PTEs and PTEG. This will be particularly important in helping us to understand how well the process of the management and allocation of the ring-fenced funds has worked.

Annex A: Specific consultation questions

A.1. Whilst we are consulting on our decisions in this draft determination as a package, and stakeholders may comment on any aspect of it, we would like to draw attention to certain issues in this document on which we would particularly welcome views. These are as follows:

(a) our proposed approach to the volume incentive in CP5 (as set out in paragraphs 19.46-19.79 above), including the approach to setting growth baselines and a ceiling and floor on payments;

(b) our proposals for certain aspects of the route-level efficiency benefit sharing (REBS) mechanism (as set out in paragraphs 19.10-19.22), comprising:

(i) our proposed approach to setting REBS baselines;

(ii) the method for calculating and reporting REBS in CP5; and

(iii) which parts of Network Rail's income and costs should be included in REBS;

(c) whether the alternative proposal on the capacity charge for freight operators proposed by the Rail Freight Operators' Association should be adopted as a substitute to retaining the existing capacity charge in CP5 (see paragraphs 16.110-16.116). We also seek views on:

(i) whether this mechanism should be adopted only for freight operators or whether it should also be adopted for passenger open access and/or franchised passenger operators; and

(ii) what the implications of its adoption for these operators would be;

(d) whether, for Network Rail to retain the benefit of an efficient renewals underspend, it should need to show that it has successfully implemented a package of improvements on asset management and improved its reporting systems (see paragraph 12.101 in the financial framework chapter);

(e) whether a value based methodology for adjusting for the non-delivery of outputs would be appropriate (see paragraph 12.107 in the financial framework chapter);

(f) in order to improve transparency and provide better incentives on Network Rail without overly complicating the financial framework, we are proposing to remove the 'internal/Network Rail' investment framework and use an amended version of the RAB roll forward process to improve the incentives on Network Rail, as discussed in paragraphs 12.136-12.147;

(g) Network Rail's cost of capital for CP5 and in particular the pre-tax cost of capital that will be used for investment framework schemes, as discussed in the impact of financial framework on financial parameters chapter (chapter 13); and

(h) our approach to financial monitoring in CP5, as discussed in the monitoring, enforcement and reporting chapter (chapter 23).

Annex B: Decision on a freight specific charge for biomass

Introduction

B.1. In chapter 16, we discuss the introduction of a freight specific charge as a mark-up on variable usage charges for certain commodities – coal for the electricity supply industry (ESI coal), iron ore and spent nuclear fuel. This would:

(a) make charges more cost-reflective so that freight bears a higher proportion of the costs it imposes on the rail network and so that the sector can provide more challenge on the efficiency and costs of its operation;

(b) allocate government subsidy more efficiently by moving it from areas where it has little impact on behaviour; and

(c) further our strategic objective of a more dynamic and commercially sustainable industry.

B.2. On 15 February 2013, we consulted on whether the freight specific charge should be applied to biomass on the same basis as that which we had concluded should apply to other commodities. Consistent with the treatment of other market segments, we also consulted on whether biomass should pay a freight-only line charge. We had previously (May 2012) said we would not levy a charge on biomass but would revisit the policy to coincide with the Department of Energy and Climate Change's (DECC's) recalculation of subsidy from 2017. We changed this stance in our January 2013 freight decision document because respondents to the May 2012 consultation had explained that investments made now would be subject to the existing subsidy regime, not a 2017 revision, and they wanted certainty about the charging regime to inform imminent investment decisions.

B.3. This annex considers the responses to the February 2013 consultation and explains our decision on biomass.

Background to the biomass sector

B.4. The biomass market is currently small and there is greater uncertainty than there is for other commodities about its prospects and about the impact of increases in track access charges on demand for it.

B.5. The UK has a legally binding target under the EU Renewable Energy Directive to increase the share of renewables in final energy consumption. To meet this target, certain types of power generator that use biomass are eligible for support under the Renewables Obligation legislation and other arrangements in Scotland. They are also eligible for support under 'contracts for difference' (CfDs).

B.6. Biomass generation is assisted by qualifying for Renewables Obligation Certificates (ROCs) that generators can sell to electricity retailers, who are obliged to buy them to cover a proportion of their sales. In July 2012, DECC published its proposals for banded support under the Renewables Obligation[414] and, in October 2012, a fact sheet on "Grandfathering and cost control for biomass co-firing and conversions"[415]. These clarified the likely level of support for biomass in England & Wales under ROCs.

B.7. Biomass generation can instead be assisted through Feed-in Tariffs and, in the case of larger schemes, CfDs with the government that guarantee the generator a fixed price rather than the variable market electricity price. DECC will be announcing the strike price for biomass CfDs later this year.

B.8. Large biomass electricity generation is normally in power stations built to be coal-fired. Electricity generation from coal is likely to be reduced considerably from present levels as in 2016 it will be restricted to the few stations that have installed emission reduction systems.

B.9. Most existing dedicated biomass power stations have been developed on a small scale, and so are likely to purchase biomass from their local areas and make little use of the rail network. Rail transport is used for biomass that is a feedstock for coal-fired power stations through 'co-firing', whereby a small quantity of wood pellets or other

[414] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42852/5936-renewables-obligation-consultation-the-government.pdf.

[415] http://webarchive.nationalarchives.gov.uk/20121217150421/http://www.decc.gov.uk/media/viewfile.ashx?filetype=4&filepath=11/meeting-energy-demand/renewable-energy/6598-fact-sheet-grandfathering-and-cost-control-for-bi.pdf&minwidth=true.

forms of biomass is blended with coal in the combustion process. Some power generators have announced plans for increasing its use considerably through converting power stations entirely to biomass use. Drax, the UK's largest power station, has explained that it is converting three of its six generating units to burn biomass; the first in the second quarter of 2013 and the second a year thereafter. Eggborough plans to convert entirely by 2016.

B.10. The potential for expansion of biomass demand from the ESI is considerable. A report for the Committee on Climate Change by Mott MacDonald in October 2011[416] estimated that a full conversion programme running at high load would require more fuel (80mt/year) than is estimated to be available, which could be about 45mt/year. For comparison, in 2010-11 1.5mt was burnt in co-firing plants and 2.9mt in dedicated biomass plants. Present ESI plans may mean that more than 20mt of biomass will be burnt each year in converted stations by mid-CP5, most of it carried by rail.

Responses to the consultation

B.11. Our consultation ended on 28 March 2013 and we received 27 replies. We have also held meetings with DECC, the Rail Freight Group (RFG), the three power companies planning to convert Drax, Eggborough and Rugeley to biomass and GB Railfreight. As well as responding to our consultation, Eggborough also published an open letter opposing the application of the charge.

B.12. Most responses opposed the imposition of a freight specific charge on biomass. DECC, Drax, Centrica, Eggborough Power Station, GDF Suez (International Power), Lynmouth Power Station, Eon, Energy UK, RFG, the Freight Transport Association (FTA), Freightliner, DB Schenker, GB Railfreight, Direct Rail Services, Bristol Port Company, The UK Major Ports Group, Railfuture, Caithness Transport Forum, WH Davis and, to a lesser extent, Network Rail, Centrica and Unite were against it. The representations made included the following points.

(a) The increase in costs the charge would produce would materially affect the viability of investment in biomass electricity power station conversions that are

[416] http://archive.theccc.org.uk/aws2/Bioenergy/Mott%20MacDonald%20biomass%20conversion%20final%20for%20publication.pdf.

necessary to further government objectives in decarbonising, diversifying and securing the supply of electricity.

(b) Biomass electricity generation relies on government subsidy (either through Renewables Obligation Certificates or under Electricity Market Reform Contracts for Differences) and so, almost by definition, cannot bear an additional charge.

(c) The Renewables Obligation banding is already set and cannot be revised to accommodate this additional cost.

(d) If the CfD strike price is changed to accommodate it, it will place a burden on energy customers.

(e) Biomass conversion for generation is an emerging market that requires substantial capital investment. It relies on long-term contracts. This additional charge may have the effect of halting a number of biomass projects.

(f) The charge runs counter to government policy.

(g) Biomass is not directly comparable to coal. It requires both a subsidy and substantial investment to convert a power station to burn biomass.

(h) Biomass for large scale generation is a fledgling industry that requires substantial investment. It cannot use the existing coal infrastructure so the two fuels are operating in different markets.

(i) Independent generators have long-term Power Purchase Agreements which limit their ability to absorb cost changes. Increasing costs risks jeopardising deployment of renewable electricity. Biomass generators are establishing long-term feedstock supply contracts.

(j) Large scale biomass generators are captive to rail because road transport would involve more greenhouse gas emissions and loss of subsidy. Biomass would be disadvantaged by a charge per tonne km.

B.13. CoalPro, EDF and RWE supported the imposition of a freight specific charge on biomass, given ORR's previous decision to introduce the charge for coal and spent nuclear fuel. They argued that:

(a) biomass competes directly with coal and to put a charge on only one would distort the market;

(b) it is fair and reasonable for power stations to face the full cost of conversion; and

(c) it is not up to ORR to subsidise particular forms of generation: EDF said, "Any subsidies for biomass should come from a single source (e.g. the Renewables Obligation or the planned Feed-in tariffs with Contracts for Difference), where they can be effectively monitored and reviewed by the Government as required."

B.14. Our method of calculating the charge, by analogy with coal, was said by some respondents not to be transparent. It was claimed that it might also be inaccurate because biomass has a lower calorific value than coal, is less dense and converts heat to electricity less efficiently: higher volumes will need to be transported and trains are likely to be longer and more frequent and may have a lower net to gross ratio: there may also be a different supply pattern. Network Rail said that, as the biomass market is in its infancy, setting any freight-specific charge for biomass on this basis could risk being prone to undue levels of uncertainty.

B.15. One stakeholder told us that, while it understood the need for the access charges it paid to be cost reflective, it was concerned that it had not been much involved in the process by which the cost estimates had been arrived at. The same stakeholder was also concerned that CFD strike prices, which in principle could have reflected the freight specific charge, had now been fixed by DECC until 2019, so that the new charge could not be passed on, with the potential to affect future investment decisions. It noted that a charge introduced in PR18 would not be subject to the same difficulty (as it would not come until 2019), and that this would also allow time for further discussions about the appropriate level of cost for recovery through the charge.

Legal considerations

B.16. We set out in detail the legal framework for a mark-up in our January 2013 conclusions document[417]. In particular, in paragraphs 4.29 and 4.30, we set out the test for a mark-up which we have applied in accordance with the Access and Management Regulations and our statutory duties.

[417] *Conclusions on the Average Variable Usage Charge and a Freight Specific Charge*, ORR, January 2013, available at http://www.rail-reg.gov.uk/pr13/PDF/freight-conclusions-jan-2013.pdf.

B.17. The mark-up must be efficient. An important aspect of this is the extent to which biomass rail transport competes with road. We consider that the charge is unlikely to divert significant biomass traffic to roads because we have been told that small biomass plants whose fuel is locally sourced are likely to use road anyway and larger plants need to use rail transport to keep emissions to sufficiently low levels to qualify for subsidy.

B.18. It must also not exclude the use of the infrastructure by biomass: it has been put to us that much of the likely biomass rail traffic depends on a small number of future investment decisions that may be prevented by the imposition of a charge. This is discussed below as is the question of whether a reduction of traffic would be efficient.

B.19. We have little data on the costs likely to be imposed on the infrastructure by biomass and our consultation assumed the charge on biomass would be levied at the same rate as for coal. Network Rail's consultants, LEK, have since done further work and produced estimates for biomass avoidable cost per gross tonne mile that are lower than those for coal. We are therefore in a position to set a charge transparently on the same basis as for other commodities, albeit perhaps with a higher degree of uncertainty.

B.20. The treatment of biomass must be non-discriminatory: a decision whether to impose a charge would apply by market segment not by operator and, both in taking that decision and in setting a level, we would be applying the same principles and methods as in other market segments.

Economic considerations

B.21. The main argument put forward by respondents to the consultation who opposed the charge was that there would be a danger that schemes to convert coal-fired power stations to biomass would not go ahead if the charge was imposed. Each conversion scheme is a large investment that would represent a large part of the market and so, if this happened:

(a) the sector would be excluded from using the infrastructure;

(b) freight traffic could decline as coal-fired stations closed and coal traffic was not replaced by the larger volumes of biomass needed to produce the same energy;

(c) the government's targets for renewable energy would be harder to achieve, arguably damaging sustainable development;

(d) there may be greater threat to the security of supply of electricity if significant amounts of coal-fired production being closed are not replaced by biomass; and

(e) economic activity, including investment and job creation, would not take place.

B.22. Key considerations in the decision are therefore whether applying the freight specific charge to biomass would create a significant risk that planned conversions would not take place either:

(a) to the extent of excluding biomass from the infrastructure; or

(b) to the extent of resulting in a significant fall in biomass freight traffic.

B.23. The impact of the charge on the cost of biomass generation is small. Our consultants NERA estimated that, assuming that biomass is transported on average 100 km by rail, an increase in access charges of £10 a thousand net tonne km, equivalent for coal to £8/kgtm – twice the rate proposed in our February 2013 consultation, would increase the variable cost of biomass generation by around 60p/MWh. The proposed charge would increase it by around 30p/MWh. If the journey were longer it might raise it by 50p/MWh.

B.24. This compares with total costs for biomass conversion calculated by Mott MacDonald in their October 2011 report ranging from £80 to £110/MWh, depending mainly on the intensity of use of the station. An October 2011 Arup report[418], commissioned by DECC and used in its calculations, has total prices of £106 in the low case, £115-6 in the medium case and £126-9 in the high case. DECC's own estimate in its July 2012 paper is £105/MWh.

B.25. A similar comparison can be made on the delivered price of biomass. Mott MacDonald's assumptions imply a central estimate of £115/tonne. DECC's July 2012 paper has a fuel cost of £79/MWh, which is consistent with a price of around £110-120/tonne. If biomass travels 150km, a charge of £4/kgtm (roughly £5/kntkm) would cost 75p/tonne. A freight-only line charge of 70p/kgtm would add a further 13p taking the total to 88p, less than 1% of the delivered price. Eggborough's

[418] https://www.gov.uk/government/publications/review-of-the-generation-costs-and-deployment-potential-of-renewable-electricity-technologies-in-the-uk-study-report-by-arup.

open letter put the impact at between 50p and £1.50 a tonne and their response to the consultation said our proposal would add about £1 to the cost of moving biomass. This is also less than 1% of the delivered price.

B.26. However, under the CfD programme, biomass conversions are being financed through long-term fixed price contracts (for both outputs and inputs) that imply low profit margins on which the charge could have a material impact. Moreover, there are other changes to rail freight access charges. It is probably open to DECC to adjust the CfD strike price to allow for the impact of the charge but not to compensate generators who have already taken the Renewables Obligation route.

Decision

B.27. Biomass is an emerging market where there is considerable uncertainty. Those expert in the area have told us that there is a risk of a freight specific charge causing large projects to be halted. DECC has told us that increasing generators' costs puts deployment of renewable electricity at risk. Generators involved have said that the charge could fundamentally alter long-term investment plans and arrangements and that the investment in biomass conversion is "not a foregone conclusion".

B.28. While the charge is only a small part of biomass generation cost we must give weight to these warnings from the generators and the relevant government department. Margins are said to be small and DECC is likely to have calculated its support to be just sufficient to make the investment come about. So, even if the impact is small, it may act as a deterrent.

B.29. For the reasons set out above, we therefore consider that if we imposed the freight specific charge on biomass there would be a significant risk that it could result in exclusion of the use of the infrastructure by biomass. Even if there were not a risk of exclusion there would be a danger of a significant fall in biomass freight traffic and of disruption to the renewables programme which might result in an outcome that was less efficient or less conducive to sustainable development. We consider that for these reasons biomass is distinct from, and can therefore be treated differently to, the other three market segments upon which we are going to levy a mark-up.

B.30. We have therefore decided not to apply the freight specific charge to biomass in CP5 but expect to review the position in PR18 when the market is more established and better understood. We propose to work further with the industry, and with customers

for biomass haulage, in CP5 in order to understand better the costs they generate on the network and how this should be reflected in charges in CP6.

Annex C: Summary of other single till income

Summary

C.1. This annex includes a summary of total other single till income (OSTI) included in the Network Rail's revenue requirement chapter (chapter 14), which can be broken down into the categories described below.

C.2. Total non-charge income, which includes: property rental, property sales, Crossrail finance charge, Welsh Valleys finance charge, facility charges and other non-charge income. This income is included in the other single till income chapter (chapter 18).

C.3. Total regulated charge income, which includes: freight charges, open access charges, managed stations income (long term charge) and franchised stations income (long term charge). This income is included in the access charges chapter (chapter 16).

C.4. Non-regulated income, which includes: depot income, freight connection agreements (including other non-regulated income), managed stations qualifying expenditure and franchised stations lease income. In our draft determination we have included Network Rail's SBP forecasts, we will review this assumption further for our final determination.

C.5. Our determination of the funding requirement to cover Network Rail's expected costs of Schedule 4 payments to freight operators and Schedule 8 cancellation payments to freight operators, are included as Schedule 4 and 8 costs, in the possessions and performance regimes chapter (chapter 20). The SBP included these amounts in other single till income and we have not restated Network Rail's SBP for this issue.

C.6. Tables C.1 to C.6 summarise other single till income for both Network Rail's SBP and our determination for Great Britain, England & Wales and Scotland. We have also included a comparison between Network Rail's SBP and our assessment in Table C.7.

Table C.1: Network Rail's SBP forecast of other single till income in CP5 (Great Britain)*

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 Total	Reference
Property rental	261.0	267.3	271.4	275.8	280.9	1,356.4	Chapter 18 Other single till income
Property sales	19.7	20.5	20.5	21.0	19.9	101.6	Chapter 18 Other single till income
Adjustment for commercial opex	-30.6	-30.8	-30.8	-30.8	-30.8	-153.8	Chapter 18 Other single till income
Crossrail finance charge	32.0	52.0	70.0	83.0	89.0	326.0	Chapter 18 Other single till income
Welsh Valleys finance charge	0.6	1.6	3.7	8.4	13.5	27.8	Chapter 18 Other single till income
Facility charges – station depot and track	50.6	53.9	53.6	53.3	53.0	264.4	Chapter 18 Other single till income
Other non-charge income	13.7	9.8	9.8	9.8	9.8	52.9	Chapter 18 Other single till income
Total non-charge income	**347.0**	**374.3**	**398.2**	**420.5**	**435.3**	**1,975.3**	**Chapter 18 Other single till income**
Freight charges	85.9	94.4	105.9	121.6	137.8	545.6	Chapter 16 Access charges
Freight connection agreements and other non-regulated income	4.9	4.9	4.9	4.9	4.9	24.5	Non-regulated income (annex C)
Total freight Income	**90.8**	**99.3**	**110.8**	**126.5**	**142.7**	**570.1**	

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 Total	Reference
Managed stations long term charge	30.5	30.5	30.5	30.5	30.5	152.5	Chapter 16 Access charges
Managed stations qualifying expenditure	43	43	43	43	43	215.0	Non-regulated income (annex C)
Total managed stations income	**73.6**	**73.6**	**73.6**	**73.6**	**73.6**	**367.9**	
Franchised stations long term charge	144.2	144.2	144.2	144.2	144.2	721.0	Chapter 16 Access charges
Franchised stations lease income	44.1	44.1	44.1	44.2	44.7	221.2	Non-regulated income (annex C)
Total franchised stations income	**188.2**	**188.3**	**188.3**	**188.4**	**188.9**	**942.0**	
Open access	**7.8**	**11.2**	**11.3**	**11.5**	**11.4**	**53.2**	**Chapter 16 Access charges**
Depots	**59.9**	**59.9**	**59.9**	**59.9**	**59.9**	**299.3**	**Non-regulated income (annex C)**
Other	**2.8**	**1.5**	**1.4**	**0.8**	**0.5**	**7.0**	
Total OSTI	**770.1**	**808.1**	**843.5**	**881.2**	**912.3**	**4,214.9**	**Chapter 14 Revenue Requirement**

*Note:

1. Shortly after publication of its SBP, Network Rail advised us that it had underestimated its stations property income by £23.5m in total over CP5 for Great Britain. In this table, we have adjusted for this issue. But in table 14.4 we have not made an adjustment.
2. At the time of Network Rail's SBP, we had not made a decision to introduce the freight specific charge and therefore Network Rail's SBP did not provide an estimate of this income. Following our decision to include a freight specific charge, we calculated freight specific charge income based on the capped charge rates as set out in our January 2013 conclusion. This would increase Network Rail's SBP freight charges by £54.0m in total over CP5 for Great Britain. In this table, we have adjusted for this issue. But in table 14.4 we have not made an adjustment.

Table C.2: Network Rail's SBP forecast of other single till income in CP5 (England & Wales)*

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 Total	Reference
Property rental	245.3	251.3	255.1	259.3	264.0	1,275.0	Chapter 18 Other single till income
Property sales	18.5	19.3	19.3	19.7	18.7	95.5	Chapter 18 Other single till income
Adjustment for commercial opex	-28.8	-29.0	-29.0	-29.0	-29.0	-144.8	Chapter 18 Other single till income
Crossrail finance charge	32.0	52.0	70.0	83.0	89.0	326.0	Chapter 18 Other single till income
Welsh Valleys finance charge	0.6	1.6	3.7	8.4	13.5	27.8	Chapter 18 Other single till income
Facility Charges – station depot and track	49.8	53.1	52.8	52.5	52.2	260.4	Chapter 18 Other single till income
Other	13.3	9.5	9.5	9.5	9.5	51.3	Chapter 18 Other single till income
Total non-charge income	**330.7**	**357.8**	**381.4**	**403.4**	**417.9**	**1,891.2**	**Chapter 18 Other single till income**
Freight charges	76.6	84.4	94.4	107.3	120.5	483.2	Chapter 16 Access charges
Freight connection agreements and other non-regulated income	4.1	4.1	4.1	4.1	4.1	20.5	Non-regulated income (annex C)

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 Total	Reference
Total Freight income	**80.7**	**88.5**	**98.5**	**111.4**	**124.6**	**503.7**	
Managed stations long term charge	28.3	28.3	28.3	28.3	28.3	141.5	Chapter 16 Access charges
Managed stations qualifying expenditure	38.6	38.6	38.6	38.6	38.6	193.0	Non-regulated income (annex C)
Total managed stations income	**66.9**	**66.9**	**66.9**	**66.9**	**66.9**	**334.5**	
Franchised stations long term charge	130.9	130.9	130.9	130.9	130.9	654.5	Chapter 16 Access charges
Franchised stations lease income	42.0	42.0	42.1	42.1	42.7	210.9	Non-regulated income (annex C)
Total franchised stations income	**172.9**	**172.9**	**173.0**	**173.0**	**173.6**	**865.4**	
Open access	**7.8**	**11.2**	**11.3**	**11.5**	**11.4**	**53.2**	**Chapter 16 Access charges**
Depots	**53.3**	**53.3**	**53.3**	**53.3**	**53.3**	**266.5**	**Non-regulated income (annex C)**
Other	**5.3**	**3.5**	**3.5**	**2.9**	**2.2**	**17.4**	
Total OSTI	**717.6**	**754.1**	**787.9**	**822.4**	**849.9**	**3,931.9**	**Chapter 14 Revenue Requirement**

*Note:

1. Shortly after publication of its SBP, Network Rail advised us that it had underestimated its stations property income by £31.9m in total over CP5 for England & Wales. In this table, we have adjusted for this issue. But in Table 14.8 we have not made an adjustment.
2. At the time of Network Rail's SBP, we had not made a decision to introduce the freight specific charge and therefore Network Rail's SBP did not provide an estimate of this income. Following our decision to include a freight specific charge, we calculated freight specific charge income based on the capped charge rates as set out in our January 2013 conclusion. This would increase Network

Rail's SBP freight charges by £42.7m in total over CP5 for Great Britain. In this table, we have adjusted for this issue. But in table 14.8 we have not made an adjustment.

Table C.3: Network Rail's SBP forecast of other single till income in CP5 (Scotland)*

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 Total	
Property rental	15.7	16.0	16.3	16.5	16.9	81.4	Chapter 18 Other single till income
Property sales	1.2	1.2	1.2	1.3	1.2	6.1	Chapter 18 Other single till income
Adjustment for commercial opex	-1.8	-1.8	-1.8	-1.8	-1.8	-9.0	Chapter 18 Other single till income
Facility charges – station depot and track	0.8	0.8	0.8	0.8	0.8	4.0	Chapter 18 Other single till income
Other	0.3	0.3	0.3	0.3	0.3	1.5	Chapter 18 Other single till income
Total non-charge income	**16.2**	**16.5**	**16.8**	**17.1**	**17.4**	**84.0**	**Chapter 18 Other single till income**
Freight charges	9.2	10.0	11.5	14.3	17.2	62.2	Chapter 16 Access charges
Freight connection agreements and other non-regulated income	0.5	0.5	0.5	0.5	0.5	2.5	Non-regulated income (annex C)
Total freight income	**9.7**	**10.5**	**12.0**	**14.8**	**17.7**	**64.6**	
Managed stations long term charge	2.3	2.3	2.3	2.3	2.3	11.5	Chapter 16 Access charges

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 Total	
Managed stations qualifying expenditure	4.4	4.4	4.4	4.4	4.4	22.0	Non-regulated income (annex C)
Total managed stations income	**6.7**	**6.7**	**6.7**	**6.7**	**6.7**	**33.4**	
Franchised stations long term charge	13.2	13.2	13.2	13.2	13.2	66.0	Chapter 16 Access charges
Franchised stations lease income	2.1	2.1	2.1	2.1	2.1	10.5	Non-regulated income (annex C)
Total franchised stations income	**15.3**	**15.3**	**15.3**	**15.3**	**15.3**	**76.6**	
Open access	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**Chapter 16 Access charges**
Depots	**6.6**	**6.6**	**6.6**	**6.6**	**6.6**	**33.0**	**Non-regulated income (annex C)**
Other	**-1.6**	**-2.0**	**-1.5**	**-1.6**	**-1.7**	**-8.4**	
Total OSTI	**52.9**	**53.6**	**55.9**	**58.9**	**62.0**	**283.2**	**Chapter 14 Revenue Requirement**

*Note:

1. Shortly after publication of its SBP, Network Rail advised us that it had overestimated its stations property income by £7.7m in total over CP5 for Scotland. In this table, we have adjusted for this issue. But in table 14.12 we have not made an adjustment.
2. At the time of Network Rail's SBP, we had not made a decision to introduce the freight specific charge and therefore Network Rail's SBP did not provide an estimate of this income. Following our decision to include a freight specific charge, we calculated freight specific charge income based on the capped charge rates as set out in our January 2013 conclusion. This would increase Network Rail's SBP freight charges by £11.3m in total over CP5 for Great Britain. In this table, we have adjusted for this issue. But in table 14.12 we have not made an adjustment.

Table C.4: Our assessment of other single till income in CP5 (Great Britain)

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 Total	Reference
Property rental	272.1	307.7	331.1	357.6	387.9	1,656.4	Chapter 18 Other single till income
Property sales	34.7	35.5	35.5	36.0	34.9	176.6	Chapter 18 Other single till income
Adjustment for commercial opex	-30.6	-30.8	-30.8	-30.8	-30.8	-153.8	Chapter 18 Other single till income
Crossrail Finance Charge	29.2	47.2	64.2	75.9	81.6	298.1	Chapter 18 Other single till income
Welsh Valleys Finance Charge	0.5	1.3	3.0	6.9	11.1	22.8	Chapter 18 Other single till income
Facility Charges – Station depot and Track	47.2	52.8	55.5	58.1	60.8	274.4	Chapter 18 Other single till income
Other	13.7	13.7	13.7	13.7	13.7	68.5	Chapter 18 Other single till income
Total non-charge income	**366.8**	**427.4**	**472.2**	**517.4**	**559.2**	**2,343.0**	**Chapter 18 Other single till income**
Freight charges	72.4	77.2	85.3	94.3	104.2	433.4	Chapter 16 Access charges
Freight connection agreements and other non-regulated income	4.5	4.5	4.5	4.5	4.5	22.5	Non-regulated income (annex C)
Total freight income	**76.9**	**81.7**	**89.8**	**98.8**	**108.7**	**455.9**	

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 Total	Reference
Managed stations long term charge	29.2	29.2	29.2	29.2	29.2	146.0	Chapter 16 Access charges
Managed stations qualifying expenditure	43.0	43.0	43.0	43.0	43.0	215.0	Non-regulated income (annex C)
Total managed stations income	**72.2**	**72.2**	**72.2**	**72.2**	**72.2**	**360.8**	
Franchised stations long term charge	120.4	120.4	120.4	120.4	120.4	602.0	Chapter 16 Access charges
Franchised stations lease income	44.0	44.1	44.1	44.2	44.7	221.1	Non-regulated income (annex C)
Total franchised stations income	**164.4**	**164.5**	**164.5**	**164.6**	**165.1**	**822.9**	**Chapter 16 Access charges**
Open access	**6.6**	**8.0**	**8.4**	**8.4**	**8.5**	**39.9**	**Chapter 16 Access charges**
Depots	**59.8**	**59.8**	**59.8**	**59.8**	**59.8**	**299.0**	**Non-regulated income (annex C)**
Total OSTI	**746.5**	**813.6**	**866.9**	**921.2**	**973.5**	**4,321.5**	**Chapter 14 Revenue Requirement**

Table C.5: Our assessment of other single till income in CP5 (England & Wales)

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 Total	Reference
Property rental	255.8	289.2	311.2	336.1	364.6	1,557.0	Chapter 18 Other single till income
Property sales	32.6	33.4	33.4	33.8	32.8	166.0	Chapter 18 Other single till income

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 Total	Reference
Adjustment for commercial opex	-28.8	-29.0	-29.0	-29.0	-29.0	-144.8	Chapter 18 Other single till income
Crossrail Finance Charge	29.2	47.2	64.2	75.9	81.6	298.1	Chapter 18 Other single till income
Welsh Valleys Finance Charge	0.5	1.3	3.0	6.9	11.1	22.8	Chapter 18 Other single till income
Facility Charges – Station depot and Track	46.3	51.7	54.2	56.8	59.3	268.3	Chapter 18 Other single till income
Other	13.4	13.4	13.4	13.4	13.4	67.0	Chapter 18 Other single till income
Total non-charge income	**349.0**	**407.2**	**450.4**	**493.9**	**533.8**	**2,234.4**	**Chapter 18 Other single till income**
Freight charges	64.8	69.2	76.6	84.3	93.0	387.9	Chapter 16 Access charges
Freight connection agreements and other non-regulated income	4.1	4.1	4.1	4.1	4.1	20.5	Non-regulated income (annex C)
Total freight income	**68.9**	**73.3**	**80.7**	**88.4**	**97.1**	**408.4**	
Managed stations long term charge	27.0	27.0	27.0	27.0	27.0	135.0	Chapter 16 Access charges
Managed stations qualifying expenditure	38.6	38.6	38.6	38.6	38.6	193.0	Non-regulated income (annex C)

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 Total	Reference
Total managed stations income	**65.6**	**65.6**	**65.6**	**65.6**	**65.6**	**328.0**	
Franchised stations long term charge	109.3	109.3	109.3	109.3	109.3	546.5	Chapter 16 Access charges
Franchised stations lease income	42.0	42.0	42.1	42.1	42.7	210.9	Non-regulated income (annex C)
Total franchised stations income	**151.3**	**151.3**	**151.4**	**151.4**	**152.0**	**757.6**	
Open access	**6.6**	**8.0**	**8.4**	**8.4**	**8.5**	**40.0**	**Chapter 16 Access charges**
Depots	**53.3**	**53.3**	**53.3**	**53.3**	**53.3**	**266.5**	**Non-regulated income (annex C)**
Total OSTI	**694.7**	**758.7**	**809.8**	**861.0**	**910.3**	**4,034.9**	**Chapter 14 Revenue Requirement**

Table C.6: Our assessment of other single till income in CP5 (Scotland)

£m (2012-13 prices)*	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Reference
Property rental	16.3	18.5	19.9	21.5	23.3	99.4	Chapter 18 Other single till income
Property sales	2.1	2.1	2.1	2.2	2.1	10.6	Chapter 18 Other single till income
Adjustment for commercial opex	-1.8	-1.9	-1.9	-1.9	-1.9	-9.4	Chapter 18 Other single till income

£m (2012-13 prices)*	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Reference
Facility Charges – Station depot and Track	0.9	1.1	1.2	1.4	1.5	6.1	Chapter 18 Other single till income
Other	0.3	0.3	0.3	0.3	0.3	1.5	Chapter 18 Other single till income
Total non-charge income	**17.8**	**20.1**	**21.6**	**23.5**	**25.3**	**108.2**	**Chapter 18 Other single till income**
Freight charges	7.5	7.9	8.7	9.8	11.1	45.0	Chapter 16 Access charges
Freight connection agreements and other non-regulated income	0.5	0.5	0.5	0.5	0.5	2.5	Non-regulated income (annex C)
Total freight income	**8.0**	**8.4**	**9.2**	**10.3**	**11.6**	**47.5**	
Managed stations long term charge	2.2	2.2	2.2	2.2	2.2	11.0	Chapter 16 Access charges
Managed stations qualifying expenditure	4.4	4.4	4.4	4.4	4.4	22.0	Non-regulated income (annex C)
Total managed stations income	**6.6**	**6.6**	**6.6**	**6.6**	**6.6**	**32.8**	
Franchised stations long term charge	11.0	11.0	11.0	11.0	11.0	55.0	Chapter 16 Access charges
Franchised stations lease income	2.1	2.1	2.1	2.1	2.1	10.5	Non-regulated income (annex C)

£m (2012-13 prices)*	2014-15	2015-16	2016-17	2017-18	2018-19	Total	Reference
Total franchised stations income	**13.1**	**13.1**	**13.1**	**13.1**	**13.1**	**65.6**	
Open access	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**Chapter 16 Access charges**
Depots	**6.6**	**6.6**	**6.6**	**6.6**	**6.6**	**33.0**	**Non-regulated income (annex C)**
Total OSTI	**52.1**	**54.8**	**57.1**	**60.1**	**63.2**	**287.1**	**Chapter 14 Revenue Requirement**

Table C.7 Difference between our determination and Network Rail's SBP (Great Britain)

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 Total
Property rental	11.1	40.4	59.7	81.8	107.0	300.0
Property sales	15.0	15.0	15.0	15.0	15.0	75.0
Crossrail Finance Charge	-2.8	-4.8	-5.8	-7.1	-7.4	-27.9
Welsh Valleys Finance Charge	-0.1	-0.3	-0.7	-1.5	-2.4	-5.0
Facility Charges – Station depot and Track	-3.4	-1.1	1.9	4.8	7.8	10.0
Other	0.0	3.9	3.9	3.9	3.9	15.6
Total non-charge income	19.8	53.1	74.0	96.9	123.9	367.7
Total freight income	**-13.9**	**-17.6**	**-21.0**	**-27.7**	**-34.0**	**-114.2**
Total managed stations income	**-1.4**	**-1.4**	**-1.4**	**-1.4**	**-1.4**	**-7.1**

£m (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 Total
Total franchised stations income	**-23.8**	**-23.8**	**-23.8**	**-23.8**	**-23.8**	**-119.1**
Open access	**-1.2**	**-3.2**	**-2.9**	**-3.1**	**-2.9**	**-13.3**
Depots	**-0.1**	**-0.1**	**-0.1**	**-0.1**	**-0.1**	**-0.3**
Other	**-2.8**	**-1.5**	**-1.4**	**-0.8**	**-0.5**	**-7.0**
Total OSTI	**-23.6**	**5.5**	**23.4**	**40.0**	**61.2**	**106.7**

Annex D: Route-level data

Structure of this annex

D.1. This annex is structured as follows:

(a) introduction to the annex;

(b) our approach to the assessment of Network Rail's route-level income and expenditure;

(c) a summary of our assessment;

(d) REBS baselines; and

(e) route-level income and expenditure assumptions, indicative revenue requirements and indicative key financial information.

Introduction

D.2. We present two separate types of route-level information for our determination. We need to do this to support route-level efficiency benefit sharing (REBS) and to facilitate our move to a more granular assessment of Network Rail's costs. This will provide greater focus on Network Rail's route-level costs and improve the information that we will have available to inform our PR18 periodic review. The two categories are:

(a) **REBS baselines** – we need to determine route-level baselines to inform the development of the final REBS baselines. Network Rail will need to ensure that the REBS baselines that are agreed (before the start of CP5) reconcile back to our England & Wales and Scotland determinations. The REBS baselines are simply a subset of the wider route-level income and cost assumptions, e.g. REBS baselines exclude Network Rail's interest costs (as TOCs/FOCs have limited influence over these costs) but our route-level income and cost assumptions will include these costs.

(b) **Route-level income and cost assumptions** – we also present our route-level assumptions for key areas of Network Rail's income and expenditure, indicative revenue requirements and indicative key financial information.

Our approach

Overview

D.3. Throughout this document, we have explained our approach to the assessment on Network Rail's income and expenditure. Below, we provide a summary of our approach for calculating our assumptions for Network Rail's CP5 income and expenditure at the route level.

D.4. To determine route-level assumptions we have:

(a) assessed Network Rail's SBP forecasts for route-level income and expenditure in CP5;

(b) where Network Rail has allocated income and expenditure to operating routes (rather than building its forecasts on a bottom-up basis), we reviewed its allocation methodologies, e.g. allocation in relation to vehicle kilometres by route, to determine whether these were reasonable; and

(c) we then applied our own assessment of efficiency to Network Rail's income and expenditure to determine our CP5 route-level assumptions.

Approach to income and expenditure

D.5. We explain below the approach we have taken to our assessment for each key element of Network Rail's income and expenditure.

Support costs

D.6. In its SBP, Network Rail allocated its central support functions to its operating routes using a relatively simple methodology. Since then, Network Rail has developed a more refined methodology for the allocations of these costs. We have reviewed this revised methodology and consider it to be reasonable. PwC has started a review of the allocation methodology that Network Rail used and we will report on its findings in our final determination.

D.7. For our assessment, we have used Network Rail's latest allocation methodology to determine the appropriate level of support costs for each of Network Rail's ten operating routes. This methodology uses a mix of different cost driver based metrics to allocate Network Rail's central support costs to operating routes on a function-by-function basis. For example, information management costs are allocated to routes by

the number of information management users and most HR costs are allocated to routes using headcount.

Operations

D.8. Network Rail's SBP included a bottom-up assessment of operations costs for each of its ten operating routes. This assessment is based on Network Rail's local plans to deliver the operating strategy. We consider Network Rail's plans for operations costs to be reasonable and so we have used Network Rail's breakdown of operations cost by route for the basis of our PR13 determination assumptions.

Maintenance

D.9. Network Rail presented its maintenance expenditure plans in the SBP on a route basis. Network Rail's plans are based on bottom-up route-based estimates of the resource required to safely maintain the railway in line with its asset policies. The route-based figures include consideration of the impact of increased traffic and new infrastructure on that route. Our route-level assessment of these costs reflects Network Rail bottom-up plans.

Renewals

D.10. Network Rail has presented its renewals expenditure plans in the SBP on a route basis. Network Rail's plans are based on the outputs of a challenge process between modelled expenditure requirements and plans developed by the routes. The company's models produce route renewals expenditure forecasts, which consider route-specific asset information, unit costs disaggregated by structural factors and efficiencies reflecting the different mix of asset types on each route. The operating routes produced their plans based on their local knowledge of the asset base, knowledge of delivery constraints, understanding of local costs and local efficiency initiatives. The challenge process between modelled expenditure and route based plans has helped to improve the robustness of the route plans.

Enhancements

D.11. For the ring-fenced funds, we have allocated an amount of cost to Network Rail's operating routes based on the percentage of train miles in that operating route. The exception to this rule is for East Coast Connectivity Fund, which has been allocated entirely to the LNE route. For enhancement projects, we have allocated costs to Network Rail's operating routes on the basis of Network Rail's SBP assumptions on the percentage of each enhancement project allocated to specific routes. We have

applied these assumptions to our own bottom-up assessment of Network Rail's enhancement project costs.

Traction electricity, industry costs and rates

D.12. Network Rail's industry costs and rates cover costs that, with the exception of traction electricity and cumulo rates, are incurred centrally with Network Rail allocating these costs to its operating routes. We have used the same approach as Network Rail for allocating our assessment of these central costs to the route-level.

Schedule 4 costs

D.13. Our route-level CP5 Schedule 4 cost assumptions are based on Network Rail's SBP methodology. For its SBP, Network Rail produced a bottom-up assessment of route-level Schedule 4 costs based on its CP5 route-level possession activity volume forecasts (by asset type) and its network-wide unit cost assumptions (for each asset type) reflecting its 2011-12 possession costs and volumes.

Schedule 8 costs

D.14. Our route-level CP5 Schedule 8 cost assumptions are based on Network Rail's SBP methodology. In its SBP, Network Rail allocated these costs to its operating routes using freight train miles. Given the materiality of these figures, together with likely 'lumpiness' in cancellations at the route-level, we believe that this is a suitable approach.

Other single till income (OSTI)

D.15. The majority of other single till income relates to Network Rail's property business and income from some enhancements undertaken by Network Rail such as Crossrail. The other elements of other single till income are mainly charging income from open access operators (passengers and freight) and stations and depots income. For property income, Network Rail used a simple metric of total income per route to allocate property income by route. We have also used this approach in this document but we will review this assumption for the final determination. For the elements of Network Rail's charging income within OSTI, we have used Network Rail's allocations, which are based on values of route-level income in CP4.

Variable usage charge income

D.16. The variable usage charge itself is not disaggregated by Network Rail operating route and so we have had to make assumptions about how to allocate Network Rail's charging income to its operating routes. Our assessment of Network Rail's variable

usage charge income from passenger operators is allocated to operating routes by multiplying service group-specific charge rates by vehicle kilometres, disaggregated by service group and operating route. For freight, commodity-specific charge rates are multiplied by tonne kilometres, disaggregated by commodity and route.

Financing assumptions

D.17. Network Rail raises debt at a GB-level and so we have to make assumptions about the financing costs that are allocated to each of Network Rail's operating routes.

(a) **Scotland:** Since 1 April 2006, the RAB for Network Rail's Scottish operating route has been separately identified from England & Wales. As part of PR08, we also disaggregated the Scottish route's net debt. Therefore, our PR13 financing cost assumptions for Scotland are based on a roll-forward from Network Rail's latest forecasts of closing CP4 RAB and debt for Scotland.

(b) **England & Wales routes:** For PR13, we have provided an indicative disaggregation of Network Rail's RAB and debt for the nine England & Wales operating routes. We have two main options for disaggregation: 1) use the same approach as for disaggregating the Scottish route, or 2) use Network Rail's methodology for disaggregating the fixed charge. These two approaches produce similar results and so we have decided to use Network Rail's fixed charge disaggregation approach. This approach uses route-level assessments of long-run renewals costs. Once we established opening CP5 RAB and debt assumptions for each of the nine routes, we then calculated Network Rail's financing costs for each route by applying our CP5 income and expenditure assumptions to the route-level CP5 opening RAB and net debt.

Changes to our route-level assumptions

D.18. In chapter 19 (Financial incentives) and chapter 23 (Monitoring, enforcement and reporting) we explain the scope that Network Rail has to adjust our assessments of route-level income and expenditure.

D.19. In summary:

(a) **REBS baselines**. PR13 final determination income and expenditure assumptions for England & Wales and Scotland will act as REBS baselines in CP5. Network Rail will be able to set REBS baselines for the nine England &

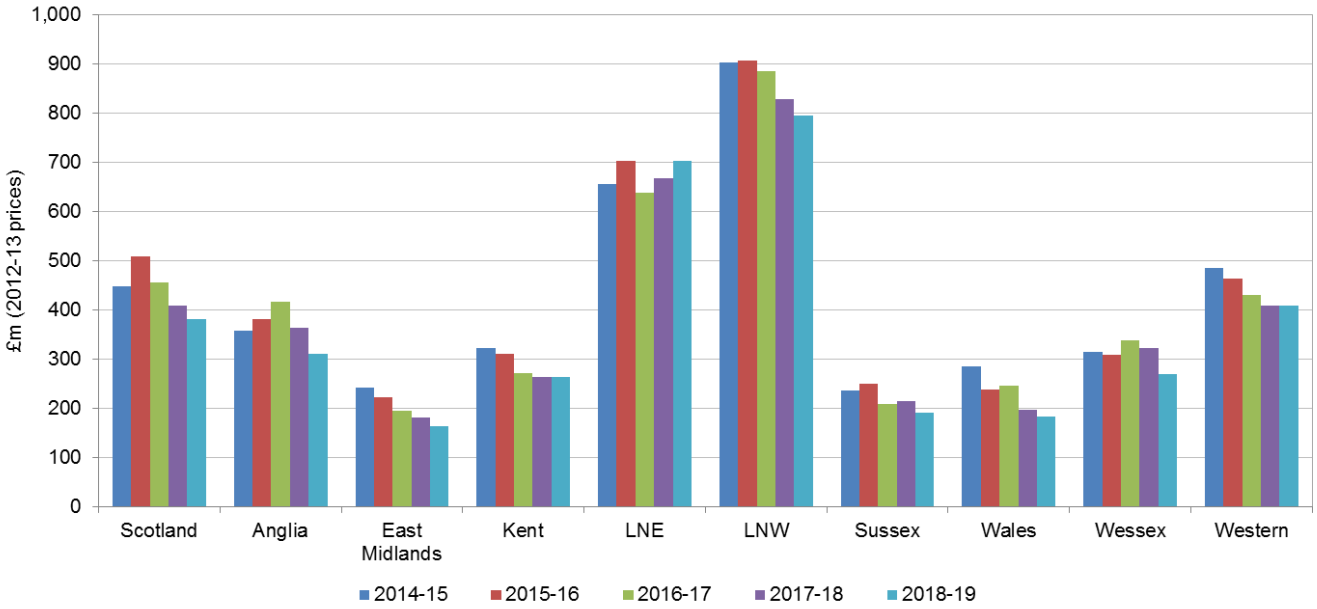
Wales operating routes, as long as they reconcile in total back to our national England & Wales determination assumptions.

(b) **CP5 financial monitoring**. For CP5, we propose that our financial monitoring should compare Network Rail's financial performance against our PR13 determination income and expenditure assumptions. Network Rail cannot change these baselines.

Summary analysis

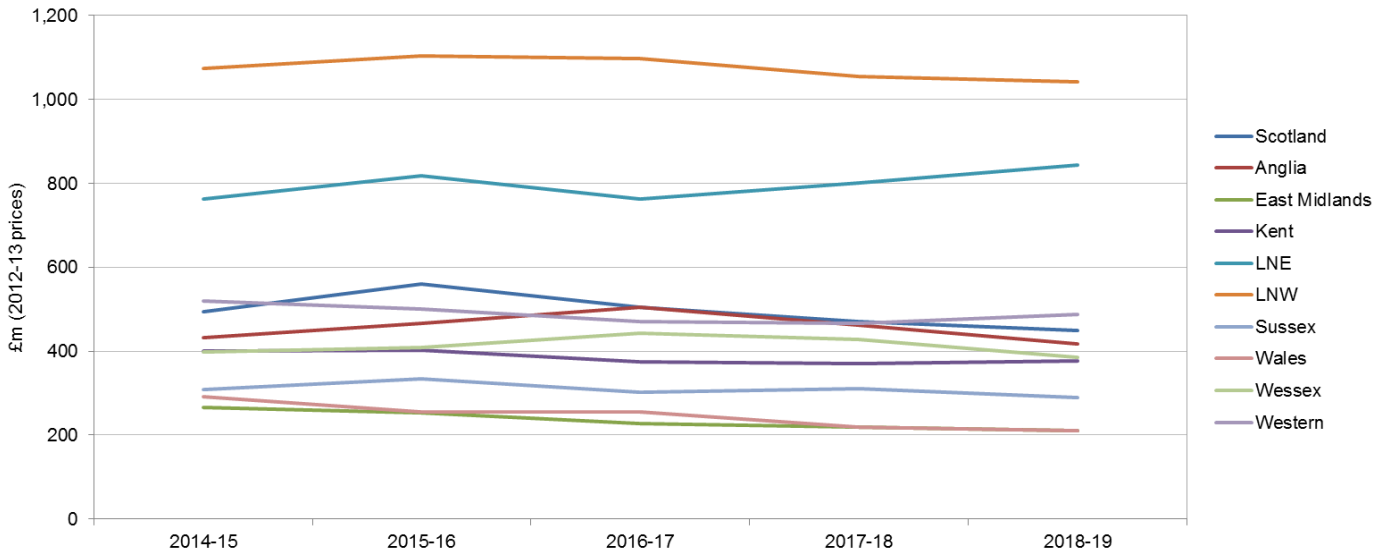
D.20. Figure D.1 sets out the REBS baselines for each route.

Figure D.1: Our assessment of the CP5 draft REBS baselines



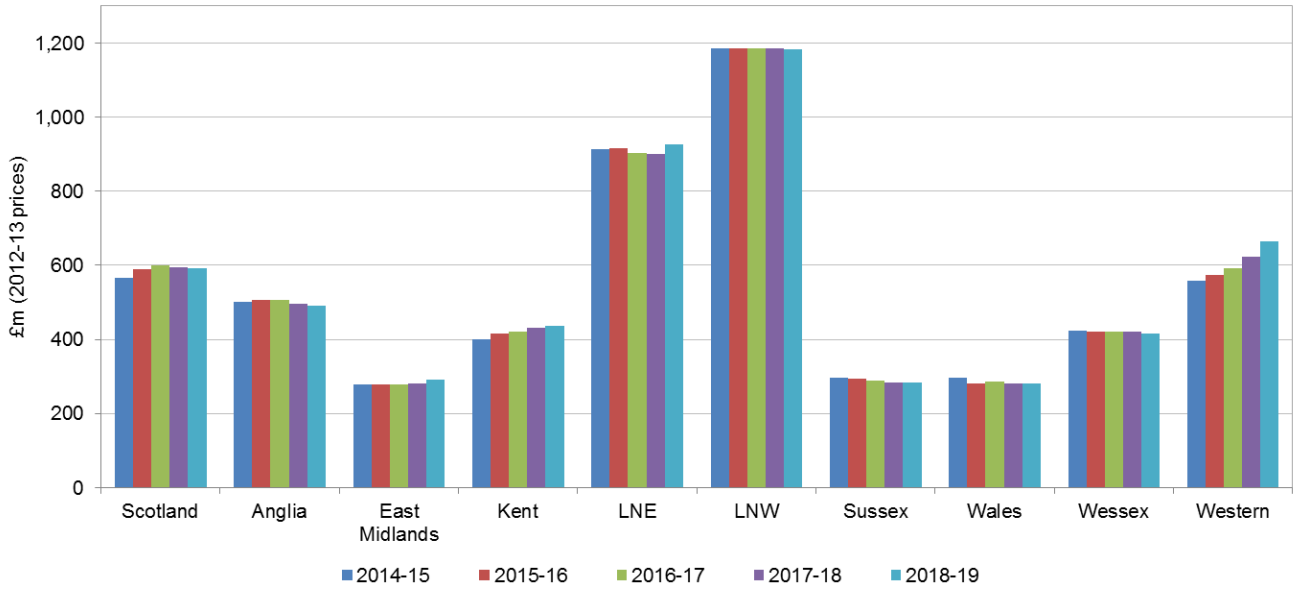
D.21. Figure D.2 sets out our assessment of the indicative expenditure by route for support, operations, maintenance, traction electricity, industry costs and rates and renewals.

Figure D.2: Our assessment of the indicative CP5 route-level expenditure assumptions



D.22. Figure D.3 sets out the indicative annual net revenue requirement for each operating route.

Figure D.3: Our assessment of the indicative CP5 net revenue requirements



REBS baselines

Overview

D.23. We set out below the draft REBS baselines for each of Network Rail's ten operating routes. We propose to include within REBS only those elements of Network Rail's costs and income that we consider train operators are able to influence. On this basis, REBS will include:

(a) support costs;

(b) operations costs;

(c) maintenance costs;

(d) renewals costs;

(e) Network Rail's share of RSSB and BTP costs;

(f) Schedule 4 & 8 costs;

(g) property income; and

(h) variable usage charge income.

D.24. We explain this further in chapter 19 (Financial incentives).

Route-by-route REBS baselines

Table D.1: Our assessment of the Scotland REBS baseline

(£m 2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Expenditure						
Support costs	46	44	41	40	38	209
Industry costs (RSSB and BTP only)	8	8	7	7	7	37
Network operations	39	38	37	34	33	181
Network maintenance	103	109	104	100	92	508
Renewals	264	322	274	244	230	1,333
Schedule 4 and 8 costs	22	26	32	24	23	128
Total expenditure	**483**	**546**	**494**	**448**	**423**	**2,395**
Income						
Advertising income	2	2	2	2	2	10
Retail income	6	7	7	8	9	37
Concessions income	1	1	1	1	1	4
Other property income	6	8	8	8	8	38
Property sales	2	2	2	2	2	11
Commercial property opex	(2)	(2)	(2)	(2)	(2)	(9)
VUC income	19	19	20	20	20	99
Total income	**(35)**	**(36)**	**(38)**	**(39)**	**(40)**	**(188)**
REBS baseline	**448**	**510**	**457**	**409**	**383**	**2,207**

Table D.2: Our assessment of the Anglia REBS baseline

(£m 2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Expenditure						
Support costs	42	40	37	36	35	190
Industry costs (RSSB and BTP only)	7	7	7	7	6	34
Network operations	42	41	39	36	34	192
Network maintenance	103	102	100	96	91	493
Renewals	184	210	252	214	175	1,034
Schedule 4 and 8 costs	18	23	26	20	18	105
Total expenditure	**398**	**423**	**461**	**409**	**358**	**2,049**
Income						
Advertising income	2	3	3	3	3	13
Retail income	9	9	10	11	12	50
Concessions income	1	1	1	1	1	5
Other property income	9	10	11	11	12	52
Property sales	3	3	3	3	3	14
Commercial property opex	(3)	(3)	(3)	(3)	(3)	(13)
VUC income	18	18	19	19	19	93
Total income	**(39)**	**(41)**	**(43)**	**(45)**	**(47)**	**(215)**
REBS baseline	**359**	**381**	**418**	**364**	**311**	**1,833**

Table D.3: Our assessment of the East Midlands REBS baseline

(£m 2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Expenditure						
Support costs	24	23	22	21	20	110
Industry costs (RSSB and BTP only)	4	4	4	4	4	20
Network operations	20	19	17	15	15	86
Network maintenance	56	55	53	52	50	265
Renewals	146	132	111	105	93	587
Schedule 4 and 8 costs	16	14	12	10	9	61
Total expenditure	**266**	**247**	**219**	**207**	**190**	**1,129**
Income						
Advertising income	1	1	1	1	1	5
Retail income	4	4	4	4	5	20
Concessions income	0	0	0	0	0	2
Other property income	3	4	4	5	5	21
Property sales	1	1	1	1	1	6
Commercial property opex	(1)	(1)	(1)	(1)	(1)	(5)
VUC income	14	14	15	15	15	73
Total income	**(23)**	**(24)**	**(24)**	**(25)**	**(26)**	**(122)**
REBS baseline	**243**	**224**	**195**	**182**	**164**	**1,007**

Table D.4: Our assessment of the Kent REBS baseline

(£m 2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Expenditure						
Support costs	37	36	33	32	31	170
Industry costs (RSSB and BTP only)	5	5	5	5	5	25
Network operations	30	29	28	28	24	139
Network maintenance	74	72	68	66	64	344
Renewals	205	198	173	171	180	928
Schedule 4 and 8 costs	17	21	16	17	16	87
Total expenditure	**369**	**360**	**324**	**319**	**320**	**1,692**
Income						
Advertising income	4	4	4	4	5	22
Retail income	14	15	16	18	19	82
Concessions income	2	2	2	2	2	8
Other property income	14	17	18	18	19	86
Property sales	5	5	5	5	5	24
Commercial property opex	(4)	(4)	(4)	(4)	(4)	(21)
VUC income	11	11	11	11	12	56
Total income	**(46)**	**(49)**	**(52)**	**(55)**	**(57)**	**(258)**
REBS baseline	**323**	**311**	**272**	**265**	**263**	**1,435**

Table D.5: Our assessment of the LNE REBS baseline

(£m 2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Expenditure						
Support costs	79	75	70	68	65	356
Industry costs (RSSB and BTP only)	12	12	11	11	10	56
Network operations	71	70	65	62	59	328
Network maintenance	164	161	154	151	148	779
Renewals	382	434	392	434	471	2,113
Schedule 4 and 8 costs	33	42	40	39	50	203
Total expenditure	**741**	**793**	**733**	**765**	**804**	**3,836**
Income						
Advertising income	4	4	4	4	5	21
Retail income	14	15	16	18	19	82
Concessions income	2	2	2	2	2	8
Other property income	14	17	17	18	19	86
Property sales	5	5	5	5	5	24
Commercial property opex	(4)	(4)	(4)	(4)	(4)	(21)
VUC income	50	51	53	54	55	265
Total income	**(85)**	**(89)**	**(94)**	**(97)**	**(100)**	**(465)**
REBS baseline	**656**	**704**	**639**	**668**	**704**	**3,371**

Table D.6: Our assessment of the LNW REBS baseline

(£m 2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Expenditure						
Support costs	109	104	97	94	90	495
Industry costs (RSSB and BTP only)	19	18	17	17	16	86
Network operations	104	100	98	93	90	484
Network maintenance	273	265	257	247	240	1,281
Renewals	473	497	498	466	457	2,391
Schedule 4 and 8 costs	42	44	45	46	39	216
Total expenditure	**1,019**	**1,028**	**1,012**	**962**	**932**	**4,953**
Income						
Advertising income	6	6	7	7	7	33
Retail income	22	22	24	27	29	124
Concessions income	2	2	2	3	3	12
Other property income	21	26	26	28	29	130
Property sales	7	7	7	7	7	36
Commercial property opex	(6)	(6)	(6)	(6)	(6)	(31)
VUC income	63	64	65	67	68	326
Total income	**(115)**	**(121)**	**(126)**	**(131)**	**(136)**	**(630)**
REBS baseline	**904**	**907**	**886**	**830**	**796**	**4,323**

Table D.7: Our assessment of the Sussex REBS baseline

(£m 2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Expenditure						
Support costs	25	24	22	22	21	113
Industry costs (RSSB and BTP only)	5	5	5	5	4	24
Network operations	30	28	28	27	26	138
Network maintenance	57	55	52	51	48	263
Renewals	151	171	140	152	131	745
Schedule 4 and 8 costs	11	12	9	9	13	54
Total expenditure	**279**	**295**	**256**	**265**	**242**	**1,337**
Income						
Advertising income	4	4	4	4	4	20
Retail income	14	14	15	17	18	77
Concessions income	1	2	2	2	2	8
Other property income	13	16	16	17	18	81
Property sales	4	4	4	5	4	22
Commercial property opex	(4)	(4)	(4)	(4)	(4)	(19)
VUC income	9	9	9	9	9	46
Total income	**(42)**	**(45)**	**(47)**	**(50)**	**(51)**	**(234)**
REBS baseline	**237**	**250**	**209**	**215**	**191**	**1,103**

Table D.8: Our assessment of the Wales REBS baseline

(£m 2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Expenditure						
Support costs	23	22	20	20	19	103
Industry costs (RSSB and BTP only)	4	4	4	4	4	19
Network operations	25	24	23	24	21	117
Network maintenance	60	58	57	55	54	284
Renewals	173	140	143	108	100	664
Schedule 4 and 8 costs	19	11	18	9	7	64
Total expenditure	**304**	**258**	**266**	**219**	**205**	**1,252**
Income						
Advertising income	1	1	1	1	1	6
Retail income	4	4	4	5	5	23
Concessions income	0	0	0	0	0	2
Other property income	4	5	5	5	5	24
Property sales	1	1	1	1	1	7
Commercial property opex	(1)	(1)	(1)	(1)	(1)	(6)
VUC income	9	9	9	9	9	45
Total income	**(18)**	**(19)**	**(20)**	**(21)**	**(22)**	**(101)**
REBS baseline	**286**	**239**	**246**	**198**	**183**	**1,151**

Table D.9: Our assessment of the Wessex REBS baseline

(£m 2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Expenditure						
Support costs	34	32	30	29	27	152
Industry costs (RSSB and BTP only)	7	7	7	6	6	33
Network operations	31	30	30	27	26	143
Network maintenance	87	85	83	78	73	407
Renewals	190	190	225	217	180	1,003
Schedule 4 and 8 costs	16	15	18	20	15	83
Total expenditure	**364**	**360**	**392**	**378**	**328**	**1,821**
Income						
Advertising income	3	4	4	4	4	19
Retail income	13	13	15	16	17	74
Concessions income	1	1	1	2	2	7
Other property income	13	15	16	17	17	78
Property sales	4	4	4	4	4	22
Commercial property opex	(4)	(4)	(4)	(4)	(4)	(19)
VUC income	17	17	17	17	17	85
Total income	**(48)**	**(51)**	**(53)**	**(56)**	**(58)**	**(266)**
REBS baseline	**316**	**308**	**339**	**322**	**270**	**1,555**

Table D.10: Our assessment of the Western REBS baseline

(£m 2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Expenditure						
Support costs	43	41	39	37	36	195
Industry costs (RSSB and BTP only)	8	7	7	7	7	35
Network operations	33	33	31	31	31	159
Network maintenance	109	108	105	102	102	527
Renewals	307	291	268	255	254	1,375
Schedule 4 and 8 costs	26	27	24	24	27	129
Total expenditure	**527**	**507**	**474**	**456**	**456**	**2,421**
Income						
Advertising income	2	2	2	2	2	10
Retail income	7	7	8	8	9	39
Concessions income	1	1	1	1	1	4
Other property income	7	8	8	9	9	41
Property sales	2	2	2	2	2	11
Commercial property opex	(2)	(2)	(2)	(2)	(2)	(10)
VUC income	24	25	25	25	26	125
Total income	**(41)**	**(43)**	**(44)**	**(46)**	**(47)**	**(221)**
REBS baseline	**486**	**464**	**430**	**410**	**409**	**2,200**

Route-level income and cost assumptions

Overview

D.25. For each operating route, we set out below, the following information:

(a) indicative annual operating and capital expenditure assumptions;

(b) indicative revenue requirement calculations; and

(c) indicative key financial information.

Individual route-level income and cost assumptions

Table D.11: Our assessment of the Scotland expenditure

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Support costs	46	44	41	40	38	209
Network operations	39	38	37	34	33	181
Traction electricity, industry costs and rates	41	49	51	53	57	250
Network maintenance	103	109	104	100	92	508
Schedule 4 & 8 costs	22	26	32	24	23	128
Total operating expenditure	**251**	**266**	**264**	**250**	**243**	**1,275**
Renewals	264	322	274	244	230	1,333
Enhancements	448	413	306	160	79	1,406
Total capital expenditure	**712**	**735**	**579**	**404**	**310**	**2,739**
Total expenditure	**963**	**1,001**	**843**	**654**	**553**	**4,014**

Table D.12: Our assessment of the Scotland revenue requirement

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Add: Total operating expenditure	251	266	264	250	243	1,275
Add: Long-run steady state amortisation	211	211	211	211	211	1,055
Add: Regulatory tax allowance	0	0	0	0	0	1
Add: Opex memorandum account	1	1	1	1	1	4
Gross rev. req. before cost of capital	**464**	**478**	**476**	**462**	**455**	**2,335**
Add: Allowed return (real cost of capital)	207	227	243	253	256	1,187
Less: Real equity surplus	(107)	(116)	(117)	(116)	(112)	(568)
Adjusted allowed return	100	110	126	137	145	618
Gross rev. req. pre-sustainability adjustments	**564**	**588**	**602**	**600**	**600**	**2,954**
Add: Additional amortisation (sustainability adjustment)	56	56	56	56	56	278
Gross revenue requirement	**619**	**644**	**658**	**655**	**656**	**3,231**
Less: other single till income	(52)	(55)	(57)	(60)	(63)	(288)
Net revenue requirement	**567**	**589**	**600**	**595**	**592**	**2,944**

Table D.13: Our assessment of the Scotland key financial information

£millions	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
£million (2012-13 prices)						
Closing RAB	5,139	5,608	5,921	6,058	6,101	6,101
Closing debt	3,326	3,744	3,994	4,061	4,032	4,032
£million (nominal prices)						
Financing costs (exc. FIM fee)	70	79	94	107	119	470
FIM fee	36	42	47	50	52	225
Total financing costs	106	121	141	157	171	695
Adjusted interest coverage ratio	1.01 x	1.01 x	1.01 x	1.01 x	1.01 x	1.01 x
Debt / RAB ratio	64.7%	66.8%	67.5%	67.0%	66.1%	66.1%

Table D.14: Our assessment of the indicative Anglia expenditure

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Support costs	42	40	37	36	35	190
Network operations	42	41	39	36	34	192
Traction electricity, industry costs and rates	60	73	77	79	84	373
Network maintenance	103	102	100	96	91	493
Schedule 4 & 8 costs	18	23	26	20	18	105
Total operating expenditure	**266**	**278**	**279**	**268**	**261**	**1,353**
Renewals	184	210	252	214	175	1,034
Enhancements	43	52	62	136	63	356
Total capital expenditure	**227**	**262**	**314**	**350**	**237**	**1,391**
Total expenditure	**493**	**540**	**593**	**619**	**499**	**2,743**

Table D.15: Our assessment of the indicative Anglia revenue requirement

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Add: Total operating expenditure	266	278	279	268	261	1,353
Add: Long-run steady state amortisation	158	158	158	158	158	791
Add: Regulatory tax allowance	0	0	0	0	0	1
Add: Opex memorandum account	2	2	2	2	2	10
Gross rev. req. before cost of capital	**426**	**438**	**439**	**429**	**422**	**2,155**
Add: Allowed return (real cost of capital)	160	161	165	170	174	830
Less: Real equity surplus	(80)	(84)	(84)	(83)	(81)	(412)
Adjusted allowed return	80	77	81	87	93	419
Gross rev. req. pre-sustainability adjustments	**506**	**516**	**520**	**516**	**515**	**2,573**
Add: Additional amortisation (sustainability adjustment)	49	49	49	49	49	244
Gross revenue requirement	**555**	**565**	**569**	**565**	**564**	**2,817**
Less: other single till income	(53)	(59)	(63)	(68)	(72)	(315)
Net revenue requirement	**501**	**505**	**506**	**497**	**492**	**2,501**

Table D.16: Our assessment of the indicative Anglia key financial information

£millions	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
£million (2012-13 prices)						
Closing RAB	3,799	3,855	3,962	4,105	4,136	4,136
Closing Debt	2,491	2,511	2,580	2,684	2,671	2,671
£million (nominal prices)						
Financing costs (exc. FIM fee)	56	55	60	68	76	314
FIM fee	28	29	31	33	34	155
Total financing costs	84	84	90	100	110	469
Adjusted interest coverage ratio	1.03 x	1.03 x	1.02 x	1.02 x	1.02 x	1.02 x
Debt / RAB ratio	65.6%	65.1%	65.1%	65.4%	64.6%	64.6%

Table D.17: Our assessment of the indicative East Midlands expenditure

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Support costs	24	23	22	21	20	110
Network operations	20	19	17	15	15	86
Traction electricity, industry costs and rates	20	23	24	26	32	125
Network maintenance	56	55	53	52	50	265
Schedule 4 & 8 costs	16	14	12	10	9	61
Total operating expenditure	**136**	**134**	**128**	**124**	**126**	**648**
Renewals	146	132	111	105	93	587
Enhancements	113	149	255	223	182	922
Total capital expenditure	**259**	**281**	**366**	**328**	**274**	**1,509**
Total expenditure	**395**	**415**	**494**	**452**	**400**	**2,157**

Table D.18: Our assessment of the indicative East Midlands revenue requirement

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Add: Total operating expenditure	136	134	128	124	126	648
Add: Long-run steady state amortisation	101	101	101	101	101	505
Add: Regulatory tax allowance	0	0	-	-	-	0
Add: Opex memorandum account	1	1	1	1	1	6
Gross rev. req. before cost of capital	**239**	**237**	**230**	**226**	**228**	**1,159**
Add: Allowed return (real cost of capital)	106	112	121	130	138	607
Less: Real equity surplus	(52)	(56)	(57)	(56)	(55)	(276)
Adjusted allowed return	53	56	64	74	84	331
Gross rev. req. pre-sustainability adjustments	**292**	**293**	**294**	**300**	**312**	**1,490**
Add: Additional amortisation (sustainability adjustment)	16	16	16	16	16	82
Gross revenue requirement	**308**	**309**	**310**	**317**	**328**	**1,573**
Less: other single till income	(29)	(31)	(33)	(35)	(37)	(166)
Net revenue requirement	**279**	**278**	**277**	**281**	**291**	**1,406**

Table D.19: Our assessment of the indicative East Midlands key financial information

£millions	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
£million (2012-13 prices)						
Closing RAB	2,574	2,738	2,986	3,197	3,354	3,354
Closing debt	1,732	1,870	2,088	2,262	2,378	2,378
£million (nominal prices)						
Financing costs (exc. FIM fee)	37	40	48	58	69	252
FIM fee	19	21	24	27	30	121
Total financing costs	56	61	72	85	99	372
Adjusted interest coverage ratio	1.02 x	1.02 x	1.02 x	1.02 x	1.02 x	1.02 x
Debt / RAB ratio	67.3%	68.3%	69.9%	70.8%	70.9%	70.9%

Table D.20: Our assessment of the indicative Kent expenditure

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Support costs	37	36	33	32	31	170
Network operations	30	29	28	28	24	139
Traction electricity, industry costs and rates	54	67	71	72	77	341
Network maintenance	74	72	68	66	64	344
Schedule 4 & 8 costs	17	21	16	17	16	87
Total operating expenditure	**212**	**224**	**217**	**216**	**212**	**1,081**
Renewals	205	198	173	171	180	928
Enhancements	501	509	460	371	139	1,981
Total capital expenditure	**706**	**707**	**634**	**543**	**319**	**2,909**
Total expenditure	**918**	**931**	**851**	**758**	**532**	**3,989**

Table D.21: Our assessment of the indicative Kent revenue requirement

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Add: Total operating expenditure	212	224	217	216	212	1,081
Add: Long-run steady state amortisation	155	155	155	155	155	773
Add: Regulatory tax allowance	0	-	-	-	-	0
Add: Opex memorandum account	2	2	2	2	2	10
Gross rev. req. before cost of capital	**369**	**381**	**373**	**372**	**369**	**1,864**
Add: Allowed return (real cost of capital)	167	189	210	227	237	1,029
Less: Real equity surplus	(81)	(90)	(91)	(90)	(87)	(439)
Adjusted allowed return	86	100	118	136	150	590
Gross rev. req. pre-sustainability adjustments	**455**	**480**	**492**	**508**	**519**	**2,454**
Add: Additional amortisation (sustainability adjustment)	31	31	31	31	31	155
Gross revenue requirement	**485**	**511**	**523**	**539**	**550**	**2,609**
Less: other single till income	(86)	(94)	(101)	(108)	(114)	(503)
Net revenue requirement	**400**	**417**	**422**	**432**	**436**	**2,106**

Table D.22: Our assessment of the indicative Kent key financial information

£millions	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
£million (2012-13 prices)						
Closing RAB	4,222	4,744	5,192	5,549	5,683	5,683
Closing debt	2,942	3,415	3,803	4,088	4,142	4,142
£million (nominal prices)						
Financing costs (exc. FIM fee)	60	71	89	107	125	452
FIM fee	31	37	44	49	52	213
Total financing costs	91	108	132	156	177	665
Adjusted interest coverage ratio	1.02 x	1.02 x	1.02 x	1.01 x	1.01 x	1.02 x
Debt / RAB ratio	69.7%	72.0%	73.2%	73.7%	72.9%	72.9%

Table D.23: Our assessment of the indicative LNE expenditure

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Support costs	79	75	70	68	65	356
Network operations	71	70	65	62	59	328
Traction electricity, industry costs and rates	67	78	81	86	100	412
Network maintenance	164	161	154	151	148	779
Schedule 4 & 8 costs	33	42	40	39	50	203
Total operating expenditure	**414**	**425**	**410**	**405**	**423**	**2,078**
Renewals	382	434	392	434	471	2,113
Enhancements	260	269	218	309	129	1,184
Total capital expenditure	**642**	**703**	**609**	**743**	**599**	**3,297**
Total expenditure	**1,056**	**1,128**	**1,020**	**1,148**	**1,022**	**5,375**

Table D.24: Our assessment of the indicative LNE revenue requirement

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Add: Total operating expenditure	414	425	410	405	423	2,078
Add: Long-run steady state amortisation	350	350	350	350	350	1,750
Add: Regulatory tax allowance	1	1	1	1	1	3
Add: Opex memorandum account	4	4	4	4	4	22
Gross rev. req. before cost of capital	**769**	**780**	**765**	**760**	**778**	**3,853**
Add: Allowed return (real cost of capital)	360	370	380	391	401	1,901
Less: Real equity surplus	(179)	(190)	(189)	(187)	(181)	(926)
Adjusted allowed return	180	180	191	204	220	975
Gross rev. req. pre-sustainability adjustments	**949**	**961**	**956**	**965**	**998**	**4,828**
Add: Additional amortisation (sustainability adjustment)	73	73	73	73	73	363
Gross revenue requirement	**1,022**	**1,033**	**1,029**	**1,037**	**1,070**	**5,191**
Less: other single till income	(108)	(117)	(127)	(136)	(145)	(632)
Net revenue requirement	**914**	**916**	**902**	**901**	**926**	**4,559**

Table D.25: Our assessment of the indicative LNE key financial information

£millions	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
£million (2012-13 prices)						
Closing RAB	8,632	8,912	9,099	9,419	9,596	9,596
Closing debt	5,721	5,916	6,011	6,236	6,310	6,310
£million (nominal prices)						
Financing costs (exc. FIM fee)	127	128	141	158	179	734
FIM fee	64	68	72	76	80	360
Total financing costs	191	196	213	234	259	1,094
Adjusted interest coverage ratio	1.02 x	1.02 x	1.02 x	1.02 x	1.02 x	1.02 x
Debt / RAB ratio	66.3%	66.4%	66.1%	66.2%	65.8%	65.8%

Table D.26: Our assessment of the indicative LNW expenditure

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Support costs	109	104	97	94	90	495
Network operations	104	100	98	93	90	484
Traction electricity, industry costs and rates	115	138	147	156	165	720
Network maintenance	273	265	257	247	240	1,281
Schedule 4 & 8 costs	42	44	45	46	39	216
Total operating expenditure	**642**	**651**	**644**	**635**	**624**	**3,196**
Renewals	473	497	498	466	457	2,391
Enhancements	447	501	406	388	250	1,992
Total capital expenditure	**920**	**998**	**904**	**854**	**707**	**4,383**
Total expenditure	**1,562**	**1,649**	**1,548**	**1,489**	**1,331**	**7,579**

Table D.27: Our assessment of the indicative LNW revenue requirement

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Add: Total operating expenditure	642	651	644	635	624	3,196
Add: Long-run steady state amortisation	432	432	432	432	432	2,159
Add: Regulatory tax allowance	1	1	1	1	1	4
Add: Opex memorandum account	5	5	5	5	5	27
Gross rev. req. before cost of capital	**1,080**	**1,089**	**1,082**	**1,073**	**1,062**	**5,387**
Add: Allowed return (real cost of capital)	448	468	488	505	518	2,426
Less: Real equity surplus	(223)	(237)	(237)	(234)	(227)	(1,157)
Adjusted allowed return	225	231	251	271	291	1,269
Gross rev. req. pre-sustainability adjustments	**1,306**	**1,321**	**1,333**	**1,344**	**1,353**	**6,656**
Add: Additional amortisation (sustainability adjustment)	46	46	46	46	46	232
Gross revenue requirement	**1,352**	**1,367**	**1,379**	**1,391**	**1,399**	**6,888**
Less: other single till income	(166)	(182)	(193)	(205)	(217)	(963)
Net revenue requirement	**1,186**	**1,185**	**1,186**	**1,185**	**1,182**	**5,925**

Table D.28: Our assessment of the indicative LNW key financial information

£millions	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
£million (2012-13 prices)						
Closing RAB	10,833	11,353	11,778	12,154	12,383	12,383
Closing debt	7,237	7,648	7,951	8,196	8,285	8,285
£million (nominal prices)						
Financing costs (exc. FIM fee)	158	164	186	211	238	958
FIM fee	80	87	94	100	105	467
Total financing costs	238	251	280	311	343	1,424
Adjusted interest coverage ratio	1.02 x	1.02 x	1.02 x	1.02 x	1.02 x	1.02 x
Debt / RAB ratio	66.8%	67.4%	67.5%	67.4%	66.9%	66.9%

Table D.29: Our assessment of the indicative Sussex expenditure

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Support costs	25	24	22	22	21	113
Network operations	30	28	28	27	26	138
Traction electricity, industry costs and rates	46	56	59	61	63	285
Network maintenance	57	55	52	51	48	263
Schedule 4 & 8 costs	11	12	9	9	13	54
Total operating expenditure	**168**	**175**	**171**	**169**	**170**	**854**
Renewals	151	171	140	152	131	745
Enhancements	54	48	82	61	34	280
Total capital expenditure	**206**	**219**	**222**	**213**	**166**	**1,025**
Total expenditure	**374**	**394**	**393**	**382**	**336**	**1,879**

Table D.30: Our assessment of the indicative Sussex revenue requirement

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Add: Total operating expenditure	168	175	171	169	170	854
Add: Long-run steady state amortisation	111	111	111	111	111	555
Add: Regulatory tax allowance	0	0	0	0	0	2
Add: Opex memorandum account	1	1	1	1	1	7
Gross rev. req. before cost of capital	**281**	**288**	**284**	**282**	**283**	**1,418**
Add: Allowed return (real cost of capital)	112	115	118	121	123	590
Less: Real equity surplus	(56)	(59)	(59)	(58)	(57)	(289)
Adjusted allowed return	56	56	59	63	66	300
Gross rev. req. pre-sustainability adjustments	**337**	**344**	**343**	**345**	**349**	**1,718**
Add: Additional amortisation (sustainability adjustment)	38	38	38	38	38	190
Gross revenue requirement	**375**	**382**	**381**	**383**	**387**	**1,908**
Less: other single till income	(79)	(87)	(93)	(99)	(105)	(463)
Net revenue requirement	**296**	**295**	**288**	**284**	**282**	**1,444**

Table D.31: Our assessment of the indicative Sussex key financial information

£millions	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
£million (2012-13 prices)						
Closing RAB	2,694	2,764	2,837	2,901	2,918	2,918
Closing debt	1,782	1,825	1,870	1,905	1,890	1,890
£million (nominal prices)						
Financing costs (exc. FIM fee)	40	40	44	49	54	225
FIM fee	20	21	22	23	24	111
Total financing costs	60	61	66	72	78	336
Adjusted interest coverage ratio	1.02 x	1.02 x	1.02 x	1.02 x	1.02 x	1.02 x
Debt / RAB ratio	66.1%	66.0%	65.9%	65.6%	64.8%	64.8%

Table D.32: Our assessment of the indicative Wales expenditure

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Support costs	23	22	20	20	19	103
Network operations	25	24	23	24	21	117
Traction electricity, industry costs and rates	11	11	11	13	16	64
Network maintenance	60	58	57	55	54	284
Schedule 4 & 8 costs	19	11	18	9	7	64
Total operating expenditure	**139**	**125**	**130**	**121**	**117**	**632**
Renewals	173	140	143	108	100	664
Enhancements	31	42	75	156	82	387
Total capital expenditure	**203**	**182**	**218**	**264**	**183**	**1,051**
Total expenditure	**342**	**308**	**349**	**385**	**300**	**1,683**

Table D.33: Our assessment of the indicative Wales revenue requirement

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Add: Total operating expenditure	139	125	130	121	117	632
Add: Long-run steady state amortisation	105	105	105	105	105	526
Add: Regulatory tax allowance	0	0	0	0	0	1
Add: Opex memorandum account	1	1	1	1	1	7
Gross rev. req. before cost of capital	**245**	**232**	**237**	**227**	**224**	**1,166**
Add: Allowed return (real cost of capital)	108	111	114	118	122	574
Less: Real equity surplus	(54)	(57)	(57)	(56)	(55)	(279)
Adjusted allowed return	54	54	57	62	67	295
Gross rev. req. pre-sustainability adjustments	**300**	**286**	**294**	**290**	**292**	**1,461**
Add: Additional amortisation (sustainability adjustment)	28	28	28	28	28	138
Gross revenue requirement	**327**	**314**	**321**	**317**	**319**	**1,599**
Less: other single till income	(30)	(32)	(34)	(36)	(38)	(171)
Net revenue requirement	**297**	**281**	**287**	**281**	**281**	**1,428**

Table D.34: Our assessment of the indicative Wales key financial information

£millions	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
£million (2012-13 prices)						
Closing RAB	2,605	2,655	2,740	2,871	2,921	2,921
Closing debt	1,728	1,752	1,811	1,913	1,931	1,931
£million (nominal prices)						
Financing costs (exc. FIM fee)	38	38	42	48	55	222
FIM fee	19	20	21	23	24	109
Total financing costs	58	59	64	71	80	331
Adjusted interest coverage ratio	1.02 x	1.02 x	1.02 x	1.02 x	1.02 x	1.02 x
Debt / RAB ratio	66.3%	66.0%	66.1%	66.6%	66.1%	66.1%

Table D.35: Our assessment of the indicative Wessex expenditure

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Support costs	34	32	30	29	27	152
Network operations	31	30	30	27	26	143
Traction electricity, industry costs and rates	58	70	74	76	79	357
Network maintenance	87	85	83	78	73	407
Schedule 4 & 8 costs	16	15	18	20	15	83
Total operating expenditure	**225**	**233**	**235**	**230**	**220**	**1,143**
Renewals	190	190	225	217	180	1,003
Enhancements	40	49	113	226	285	714
Total capital expenditure	**230**	**239**	**338**	**443**	**466**	**1,717**
Total expenditure	**455**	**473**	**573**	**674**	**686**	**2,860**

Table D.36: Our assessment of the indicative Wessex revenue requirement

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Add: Total operating expenditure	225	233	235	230	220	1,143
Add: Long-run steady state amortisation	155	155	155	155	155	775
Add: Regulatory tax allowance	0	0	0	0	0	2
Add: Opex memorandum account	2	2	2	2	2	10
Gross rev. req. before cost of capital	**382**	**390**	**392**	**388**	**377**	**1,929**
Add: Allowed return (real cost of capital)	157	158	162	170	181	828
Less: Real equity surplus	(79)	(82)	(82)	(82)	(80)	(405)
Adjusted allowed return	78	76	80	88	101	423
Gross rev. req. pre-sustainability adjustments	**460**	**466**	**472**	**476**	**478**	**2,352**
Add: Additional amortisation (sustainability adjustment)	46	46	46	46	46	228
Gross revenue requirement	**506**	**512**	**517**	**522**	**524**	**2,581**
Less: other single till income	(82)	(90)	(96)	(102)	(107)	(479)
Net revenue requirement	**423**	**421**	**421**	**420**	**417**	**2,102**

Table D.37: Our assessment of the indicative Wessex key financial information

£millions	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
£million (2012-13 prices)						
Closing RAB	3,732	3,771	3,909	4,151	4,416	4,416
Closing debt	2,451	2,454	2,555	2,758	2,978	2,978
£million (nominal prices)						
Financing costs (exc. FIM fee)	55	54	59	69	83	319
FIM fee	28	29	30	33	37	156
Total financing costs	83	82	89	102	119	475
Adjusted interest coverage ratio	1.03 x	1.03 x	1.02 x	1.02 x	1.02 x	1.02 x
Debt / RAB ratio	65.7%	65.1%	65.4%	66.4%	67.4%	67.4%

Table D.38: Our assessment of the indicative Western expenditure

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Support costs	43	41	39	37	36	195
Network operations	33	33	31	31	31	159
Traction electricity, industry costs and rates	26	27	27	41	65	187
Network maintenance	109	108	105	102	102	527
Schedule 4 & 8 costs	26	27	24	24	27	129
Total operating expenditure	**238**	**236**	**226**	**236**	**261**	**1,197**
Renewals	307	291	268	255	254	1,375
Enhancements	761	807	729	469	251	3,018
Total capital expenditure	**1,069**	**1,098**	**997**	**723**	**506**	**4,393**
Total expenditure	**1,307**	**1,334**	**1,224**	**959**	**767**	**5,590**

Table D.39: Our assessment of the indicative Western revenue requirement

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Add: Total operating expenditure	238	236	226	236	261	1,197
Add: Long-run steady state amortisation	181	181	181	181	181	905
Add: Regulatory tax allowance	0	0	-	-	-	1
Add: Opex memorandum account	2	2	2	2	2	11
Gross rev. req. before cost of capital	**422**	**420**	**410**	**419**	**444**	**2,115**
Add: Allowed return (real cost of capital)	199	234	266	291	305	1,295
Less: Real equity surplus	(96)	(108)	(110)	(110)	(105)	(529)
Adjusted allowed return	103	126	156	181	200	766
Gross rev. req. pre-sustainability adjustments	**525**	**546**	**565**	**600**	**645**	**2,881**
Add: Additional amortisation (sustainability adjustment)	94	94	94	94	94	470
Gross revenue requirement	**619**	**640**	**659**	**694**	**739**	**3,351**
Less: other single till income	(60)	(65)	(68)	(72)	(75)	(340)
Net revenue requirement	**559**	**575**	**591**	**622**	**664**	**3,011**

Table D.40: Our assessment of the indicative Western key financial information

£millions	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
£million (2012-13 prices)						
Closing RAB	5,124	5,947	6,669	7,117	7,348	7,348
Closing debt	3,626	4,388	5,029	5,379	5,502	5,502
£million (nominal prices)						
Financing costs (exc. FIM fee)	72	90	117	144	167	590
FIM fee	37	47	57	65	69	275
Total financing costs	109	137	174	208	236	864
Adjusted interest coverage ratio	1.02 x	1.02 x	1.01 x	1.01 x	1.01 x	1.02 x
Debt / RAB ratio	70.8%	73.8%	75.4%	75.6%	74.9%	74.9%

Annex E: Funding of enhancement projects

Summary

E.1. This annex summarises our determination on the funding of enhancement projects. In some cases specific schemes are being funded while in others Network Rail is funded to meet a specification.

E.2. Although we have assumed costs for delivering individual projects it is the total cost for England & Wales and for Scotland that we have used to determine how much revenue Network Rail needs. Because there are so many projects at an early stage of development we will revisit these assumptions by the end of 2014-15.

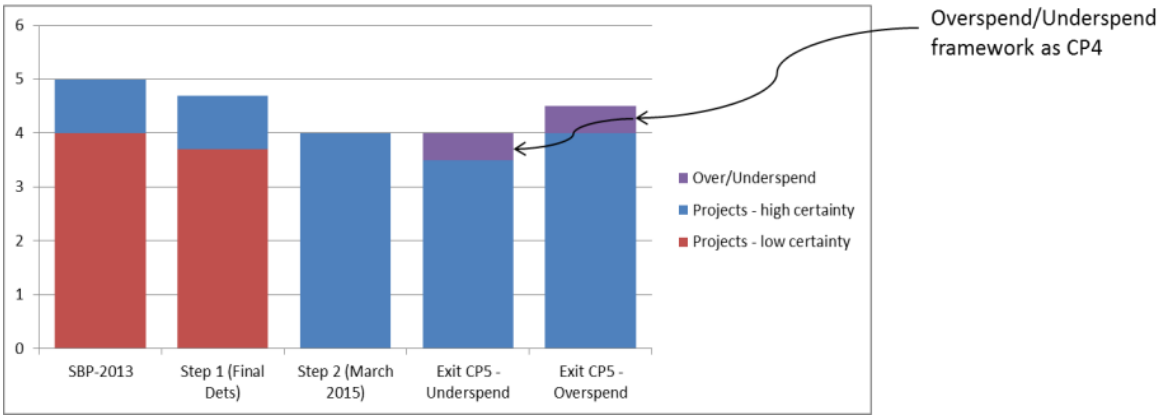
E.3. Once we have completed our second review Network Rail is free to budget for individual schemes as it sees fit and the underspend/overspend framework (RAB roll forward) will apply to the aggregate costs. The exceptions are:

(a) the ring-fenced funds, where Network Rail is funded for spending up to the caps shown in Table E.1; and

(b) schemes subject to bespoke target price arrangements. In England & Wales, these are Thameslink and Crossrail. In Scotland, these are EGIP and Borders.

E.4. Figure E.1 illustrates how the underspend/overspend framework will apply in CP5.

Figure E.1: Enhancements overspend/underspend in CP5



List of projects

Table E.1: Projects in England & Wales

£m (2012-13 prices)	Determination
Schemes not subject to further review and not included in the RAB roll forward	
Thameslink & Crossrail	3,064
Ring-fenced funds	1,179
Sub total	**4,243**
Schemes subject to further review by Mar 2015 and included in the RAB roll forward	
Electrification schemes	
Great Western electrification	
Bridgend to Swansea electrification	
North Trans-Pennine electrification	
Micklefield to Selby electrification	
North West electrification	
MML electrification	
Derby station area remodelling	
The electric spine	
Acton to Willesden electrification (WCML)	
Thames Valley branches	
Walsall to Rugeley electrification	
Welsh Valley Lines electrification	
Other committed projects	
East West rail	
Northern Hub	
IEP programme	
Reading station area redevelopment	
Stafford area improvement scheme	

£m (2012-13 prices)	Determination
West Coast power supply upgrade	
Other named schemes & CP4 rollover	
Oxford station area capacity and enlargement	
Huddersfield station capacity improvement	
Western access to London Heathrow Airport	
Service improvements in the Ely area	
Redhill additional platform	
Waterloo	
Dr Days to Filton Abbey Wood capacity	
Bristol Temple Meads passenger capacity	
Birmingham New Street Gateway	
Bromsgrove electrification	
Redditch branch enhancement	
Kent power supply upgrade (CP4)	
Barry - Cardiff Queen Street corridor	
HLOS capacity metric schemes	
Micklefield turnback	
South London HV traction power upgrade	
West Anglia Main Line capacity increase	
Bow Junction upgrade with turnbacks	
West of England DMU capability works	
South Yorkshire train lengthening	
East Kent re-signalling phase 2	
Stevenage and Gordon Hill turnbacks	
Reading, Ascot to Waterloo train lengthening	
West Yorkshire train lengthening	

£m (2012-13 prices)	Determination
Uckfield line train lengthening	
MML long distance train lengthening	
East Leeds area	
Route gauge clearance for different EMUs	
Bradford Mill Lane capacity	
Leeds platform 0	
Leeds station capacity	
Leeds platform 17 lengthening	
Chiltern Main Line train lengthening	
North West train lengthening	
New Cross Grid	
Anglia traction power supply upgrade	
Sussex traction power supply upgrade	
Wessex traction power supply upgrade	
London Victoria capacity improvements	
Kent traction power supply upgrade	
LNE routes traction power supply upgrade	
Sub total	**6,096**
Overlay for other adjustments[419]	**494**
GRAND TOTAL FOR ENGLAND & WALES	**10,833**

[419] Explained in Table 9.5.

Table E.2: Projects in Scotland

£m (2012-13 prices)	Determination
Schemes not subject to further review and not included in RAB roll forward	
Funds	145
EGIP: Springburn to Cumbernauld	16
Borders	127
Sub total	**288**
Schemes subject to further review by Mar 2015 but not included in RAB roll forward	
EGIP: Edinburgh to Glasgow electrification	
EGIP: Edinburgh gateway	
EGIP: Infrastructure	
Sub total	**474**
Schemes subject to further review by Mar 2015 and included in RAB roll forward	
Aberdeen to Inverness journey time improvements and other enhancements	
Highland Main Line journey time improvements	
Rolling programme of electrification	
Motherwell re-signalling enhancements	
Motherwell area stabling	
Other projects to meet the outputs	
Sub total	**582**
Overlay for other adjustments[420]	**62**
GRAND TOTAL IN SCOTLAND	**1,406**

[420] Explained in Table 9.7 in chapter 9.

Annex F: Further detail on the effect of the financial framework on the level of access charges

Introduction

F.1. This annex sets out:

(a) the total value of the fixed track access charge, if we assume that there are no network grant payments. If part of Network Rail's revenue requirement is not provided by network grants then access charges would increase by the same amount as the reduction in network grants; and

(b) what Network Rail's revenue requirement and access charges would be if we had used its cost of capital without making the adjusted WACC adjustments or using the PR08 ring-fenced approach. The changes to the calculation of the net revenue requirement would be that there would not be an equity surplus adjustment and we would revise the financial sustainability adjustment. To keep this analysis as straightforward as possible, we have assumed that there is no financial sustainability adjustment in this scenario (i.e. revenue is neither increased nor decreased). There are also small consequential changes to corporation tax.

F.2. Table F.1 sets out the fixed track access charges if part of Network Rail's revenue requirement is not provided by network grants. Tables F.2 to F.7 set out the calculation of Network Rail's revenue requirement if we had used its cost of capital without making the adjusted WACC adjustments or using the PR08 ring-fenced approach.

F.3. Chapter 16 on access charges also sets out the effect on charges of network grant and the adjusted WACC approach.

Table F.1: Our comparison of fixed track access charges including and excluding network grant for the whole of CP5

£m in 2012-13 prices	Fixed track access charges for CP5 (based on 5% headroom)	Network grant (based on 5% headroom)	Total	Fixed access charge without grant
Great Britain	4,366	19,586	23,952	23,952
England & Wales	3,559	17,661	21,220	21,220
Scotland	807	1,925	2,732	2,732

Table F.2: Our assessment of the CP5 revenue requirement for Great Britain (cost of capital)

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Total operating expenditure	2,692	2,748	2,703	2,656	2,658	13,456
Add: Long-run steady state amortisation (including non-capex amortisation)	1,959	1,959	1,959	1,959	1,959	9,794
Add: Regulatory tax allowance	4	4	4	124	221	356
Add: Opex memorandum account	23	23	23	23	23	115
Gross rev. req. before cost of capital	**4,677**	**4,734**	**4,689**	**4,761**	**4,860**	**23,721**
Add: Allowed return (real cost of capital)	2,035	2,176	2,317	2,446	2,545	11,518
Less: Real equity surplus	-	-	-	-	-	-
Adjusted allowed return	2,035	2,176	2,317	2,446	2,545	11,518
Gross rev. req. pre-sustainability adjustments	**6,712**	**6,909**	**7,006**	**7,207**	**7,406**	**35,239**
Add: Additional amortisation (sustainability adjustment)	-	-	-	-	-	-
Gross revenue requirement	**6,712**	**6,909**	**7,006**	**7,207**	**7,406**	**35,239**
Less: Other single till income	(747)	(813)	(867)	(921)	(973)	(4,321)
Net revenue requirement	**5,965**	**6,096**	**6,139**	**6,286**	**6,433**	**30,918**

Table F.3: CP5 key financial information for Great Britain (cost of capital)

£millions	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
£million (2012-13 prices)						
Closing RAB	49,831	53,298	56,520	59,426	61,234	61,234
Closing debt	32,486	34,322	35,809	36,897	36,832	36,832
£million (nominal prices)						
Financing costs (exc FIM fee)	708	737	837	952	1,066	4,300
FIM fee	358	392	423	451	469	2,094
Total financing costs	1,067	1,129	1,260	1,402	1,536	6,393
Adjusted interest coverage ratio	2.04 x	2.12 x	2.07 x	2.02 x	1.97 x	2.05 x
Debt / RAB ratio	65.2%	64.4%	63.4%	62.1%	60.1%	60.1%

Table F.4: CP5 revenue requirement for England & Wales (cost of capital)

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Total operating expenditure	2,440	2,482	2,439	2,405	2,415	12,182
Add: Long-run steady state amortisation (including non-capex amortisation)	1,748	1,748	1,748	1,748	1,748	8,739
Add: Regulatory tax allowance	3	3	3	104	195	309
Add: Opex memorandum account	22	22	22	22	22	111
Gross rev. req. before cost of capital	**4,214**	**4,256**	**4,213**	**4,279**	**4,380**	**21,341**
Add: Allowed return (real cost of capital)	1,826	1,945	2,068	2,185	2,278	10,302
Less: Real equity surplus	-	-	-	-	-	-
Adjusted allowed return	1,826	1,945	2,068	2,185	2,278	10,302
Gross rev. req. pre-sustainability adjustments	**6,040**	**6,201**	**6,280**	**6,464**	**6,658**	**31,643**
Add: Additional amortisation (sustainability adjustment)	-	-	-	-	-	-
Gross revenue requirement	**6,040**	**6,201**	**6,280**	**6,464**	**6,658**	**31,643**
Less: Other single till income	(694)	(759)	(810)	(861)	(910)	(4,034)
Net revenue requirement	**5,345**	**5,442**	**5,471**	**5,603**	**5,748**	**27,610**

Table F.5: CP5 key financial information for England & Wales (cost of capital)

£millions	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
£million (2012-13 prices)						
Closing RAB	44,636	47,578	50,433	53,147	54,856	54,856
Closing debt	29,214	30,698	32,005	33,098	33,133	33,133
£million (nominal prices)						
Financing costs (exc FIM fee)	638	660	747	851	957	3,854
FIM fee	323	352	378	403	422	1,878
Total financing costs	961	1,012	1,126	1,255	1,379	5,732
Adjusted interest coverage ratio	2.03 x	2.11 x	2.07 x	2.02 x	1.97 x	2.04 x
Debt / RAB ratio	65.4%	64.5%	63.5%	62.3%	60.4%	60.4%

Table F.6: CP5 revenue requirement in Scotland (cost of capital)

£millions (2012-13 prices)	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
Total operating expenditure	251	266	264	250	243	1,275
Add: Long-run steady state amortisation (including non-capex amortisation)	211	211	211	211	211	1,055
Add: Regulatory tax allowance	0	0	4	27	29	60
Add: Opex memorandum account	1	1	1	1	1	4
Gross rev. req. before cost of capital	**464**	**478**	**480**	**489**	**484**	**2,394**
Add: Allowed return (real cost of capital)	209	230	249	261	267	1,216
Less: Real equity surplus	-	-	-	-	-	-
Adjusted allowed return	209	230	249	261	267	1,216
Gross rev. req. pre-sustainability adjustments	**672**	**708**	**729**	**750**	**751**	**3,610**
Add: Additional amortisation (sustainability adjustment)	-	-	-	-	-	-
Gross revenue requirement	**672**	**708**	**729**	**750**	**751**	**3,610**
Less: Other single till income	(52)	(55)	(57)	(60)	(63)	(288)
Net revenue requirement	**620**	**653**	**672**	**690**	**687**	**3,323**

Table F.7: Our assessment of the CP5 key financial information for Scotland (cost of capital)

£millions	2014-15	2015-16	2016-17	2017-18	2018-19	CP5 total
£million (2012-13 prices)						
Closing RAB	5,195	5,719	6,087	6,280	6,378	6,378
Closing debt	3,272	3,624	3,804	3,800	3,699	3,699
£million (nominal prices)						
Financing costs (exc FIM fee)	70	76	90	101	109	446
FIM fee	35	40	45	47	48	216
Total financing costs	105	117	135	148	157	661
Adjusted interest coverage ratio	2.11 x	2.15 x	2.08 x	2.03 x	2.01 x	2.08 x
Debt / RAB ratio	63.0%	63.4%	62.5%	60.5%	58.0%	58.0%

Annex G: Comparison of PR13 to the Rail Value for Money (RVfM) study

Structure of this annex

G.1. This annex has the following structure:

(a) introduction and background;

(b) key findings of the RVfM study;

(c) sources of efficiencies; and

(d) comparison of RVfM efficiencies to our determination.

Introduction and background

G.2. This annex summarises the purpose and key findings of the Rail Value for Money (RVfM) study led by Sir Roy McNulty and compares the study's recommendations on industry cost savings and efficiencies to our determination.

G.3. The RVfM study, published in May 2011, was commissioned jointly by DfT and ORR. As co-sponsor of the RVfM study, we welcomed and strongly endorsed its findings.

G.4. The aim of the RVfM study was to examine the overall cost structure of all elements of the railway sector and to identify options for improving value for money to passengers and the taxpayer while continuing to expand capacity as necessary and drive up passenger satisfaction. The report specifically did not examine possible cuts to the rail network[421].

Key findings of the RVfM study

G.5. The RVfM study identified a widespread recognition that the industry had problems in terms of efficiency and costs. It also highlighted that unit costs per passenger kilometre have not improved since the mid-1990s and that, based on 2008-09 costs, the industry's costs are 30% higher than European comparators.

[421] The terms of reference of the RVfM study are set out in Annex A of the RVfM Summary report, available at: http://www.rail-reg.gov.uk/upload/pdf/rail-vfm-summary-report-may11.pdf.

G.6. The RVfM study identified a number of key barriers within the industry to improving value for money. These included: the fragmentation of structures and interfaces; the ways in which the roles of Government and industry have evolved; ineffective and misaligned incentives; a franchising system that does not encourage cost reduction sufficiently; management approaches that fall short of best-practice in a number of areas that are key cost drivers; and a railway culture which is not conducive to the partnership and continuous improvement approaches required for effective cost reduction.

G.7. As a result of its analysis, the RVfM study recommended that the industry should aim to achieve a 30% reduction in unit costs (i.e. costs per passenger-km) by 2018-19, compared to 2008-09 costs. The study suggested a three part solution to improving efficiency:

(a) **changes to create an enabling environment**. This included greater clarity on rail policy, objectives and strategies, stronger and more cohesive industry leadership, changes to structures and interfaces to improve the ways in which rail organisations and people work together, incentives that are more effective and better aligned, a review of fares policy and structures, and greater clarity as to what Government subsidy is buying;

(b) **changes which deliver the major savings**: these focus principally on reaching best-practice in asset management, programme and project management, supply chain management, standards and technology, HR management, and pursuing initiatives in the areas of capacity utilisation, information systems, and new approaches to enable lower-cost regional railways; and

(c) **effective approaches to drive implementation**: developing an implementation plan with the involvement and commitment of all concerned to deliver the recommendations of the study, with a small independent 'change team' working closely with DfT and ORR, and a new industry leadership group – the Rail Delivery Group.

G.8. In support of its recommendations, the RVfM study identified a number of key areas where savings could be realised to deliver improved value for money. The majority of these savings were assumed to result from efficiencies in train operations, rolling stock companies and infrastructure management.

Sources of efficiencies

G.9. The RVfM study drew mainly on two types of analysis to support its recommendations for improving value for money by 2018-19:

(a) a desktop (or 'should cost') analysis, based on the evidence we gathered as part of PR08 and other GB and international railway benchmarking evidence; and

(b) a bottom-up analysis, based on an assessment of the individual savings that could be made if the recommendations of the study were to be implemented in full.

G.10. Figure G.1 sets out the areas of the industry that the RVfM study expected to generate savings between 2008-09 and 2018-19. The RVfM study assumed that Network Rail would provide between 67% and 81% of the total savings identified in the report.

Table G.1: Source of total RVfM efficiencies

Total RVfM efficiencies	Should cost assessment		Bottom-up assessment[422]	
2008-09 prices in £billion	**Low**	**High**	**Low**	**High**
Network Rail	1.8 (71%)	2.3 (67%)	2.2 (80%)	2.8 (81%)
Other (including TOC/ROSCOs)	0.7 (29%)	1.2 (33%)	0.6 (20%)	0.7 (19%)
Projected savings required	**2.5**	**3.5**	**2.8**	**3.4**

G.11. Our analysis of the RVfM study has focused on the savings that the report attributed to Network Rail, and more specifically those that the RVfM study assumed would be delivered in CP5. Table G.2 sets out the savings attributable to Network Rail and the rest of the industry in CP5, i.e. excluding efficiencies assumed to be achieved in CP4. For ease of comparison we have presented these savings in 2012-13 prices, as this is the price base for our determination. Table G.2 highlights that the proportion of CP5 RVfM savings in CP5 attributable to Network Rail is between 49% and 73%. Although Network Rail's contribution to the RVfM savings is significant, i.e. between half and three quarters of the total savings, the study still expected the rest of the industry to contribute substantial savings, e.g. from train operations, rolling stock arrangements

[422] In the RVfM study, the bottom-up savings are presented on a funding basis in 2009-10 prices, i.e. including the implications of Network Rail's funding via the RAB. In Tables G.1 and G.2, we have set out the RVfM bottom-up assessment of efficiencies on an expenditure basis to be comparable with the 'should cost analysis'.

and freight operations. Even for the savings attributed to Network Rail, in many cases these savings are dependent on changes or reforms not just within Network Rail but also from other parts of the industry. For example, costs savings from improved alignment of incentives between different industry participants, spreading of peak demand and more track-friendly trains cannot be achieved by Network Rail alone.

Table G.2: Source of CP5 RVfM efficiencies

CP5 RVfM efficiencies	Should cost assessment		Bottom-up assessment[422]	
2012-13 prices in £billion	**Low**	**High**	**Low**	**High**
Network Rail	0.7 (49%)	1.2 (52%)	1.1 (68%)	1.8 (73%)
Other (including TOC/ROSCOs)	0.7 (51%)	1.2 (48%)	0.5 (32%)	0.7 (27%)
Projected savings required	**1.4**	**2.4**	**1.6**	**2.5**

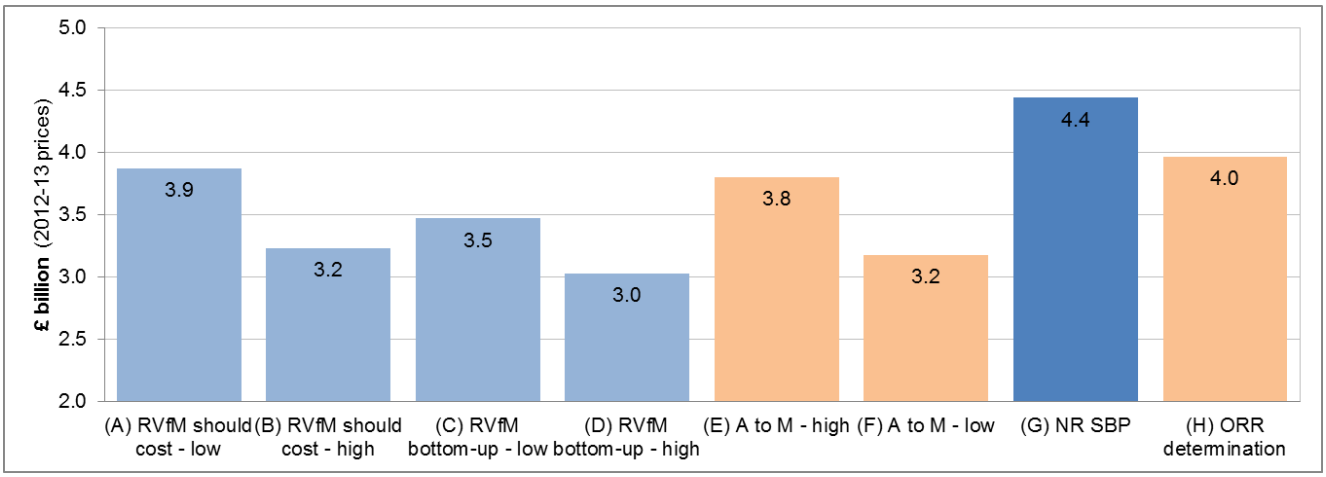
Comparison of efficiencies identified by RVfM study

G.12. In chapter 4, we summarise the efficiencies that we expect Network Rail to achieve in its support, operations, maintenance and renewals costs by the end of CP5. Below we compare our PR13 assumptions on the Network Rail's CP5 post-efficient costs to those in the RVfM study[423].

G.13. The RVfM study was based on the industry structure (and costs and revenues) in 2008-09. In Figure G.2, we present the assumed total value of Network Rail's support, operations, maintenance and renewals costs in 2018-19 as per the RVfM study, Network Rail's SBP and our determination.

[423] The RVfM study also set out recommendations for achieving savings of between around £160m and £325m (in 2013-13 prices) in Network Rail's enhancements costs. These savings were only reflected in its bottom-up analysis and for comparability with the RVfM should cost assessment, we have excluded enhancements costs from the analysis below.

Figure G.1: Comparison of Network Rail's 2018-19 costs



G.14. In financial terms our determination is below Network Rail's SBP but above the RVfM study and our advice to ministers ranges. It is difficult to compare our findings directly with those of the RVfM study, because that study did not take account of increasing outputs or longer term sustainability issues (such as the extra volumes of civils work we now consider need to be delivered). The RVfM study also said that achieving its high estimates for the industry as a whole depended on wide ranging changes across the industry. We are slightly above our advice to ministers range, reflecting the better information we now have.

G.15. In this periodic review we have established and drawn on a much deeper and robust base of studies, with newer evidence and analysis, than was available to the RVfM study or at the time of our advice to ministers. The review sets a strong efficiency challenge and our plans for enhancements efficiency develop this challenge further. Taking all this into account we believe that the efficiency challenge identified in the RVfM study for Network Rail itself will have been fully addressed for CP5.

G.16. It should also be noted that the RVfM study identified savings of £0.5bn to £1.2bn that it considered other parts of the industry, mainly train operators, could make by the end of CP5.

Annex H: List of consultancy and independent reporter studies

Introduction

H.1. This annex sets out the studies carried out by our consultants and the independent reporters that have informed our work on this determination. These are available on our website[424].

Table H.1: List of studies by our consultants and the independent reporters that have informed our determination

Consultancy / reporter study	Consultancy/ reporter firm	Date
Relative infrastructure managers' efficiency study – Evaluation of Gap Analysis Factors	RailKonsult	July 2011
Network Rail materials costs benchmarking study	Arup	August 2011
Initial Industry Plan 2011 Review	AMCL	December 2011
Initial Industry Plan (IIP) 2011 Review	Arup	December 2011
Using Incentives to Improve Capacity Utilisation	NERA	December 2011
Network Rail's Allowed Return	First Economics	December 2011
Review of Network Rail's process to capture enhancement costs	Nichols	January 2012
Network Rail bottom-up benchmarking programme audit	Arup	January 2012
Assessment of robustness of property income forecasts of Network Rail in the Initial Industry Plan (IIP)	DTZ	January 2012
Efficient Expenditure Benchmarking of Network Rail against North American Railroads	RailKonsult	January 2012
Impact of changes in track access charges on rail freight traffic - Stage 1 Report	MDS Transmodal	February 2012

[424] http://www.rail-reg.gov.uk/pr13/publications/consultants-reports.php.

Consultancy / reporter study	Consultancy/ reporter firm	Date
Network Rail bottom-up benchmarking review: benchmarking of operations costs	Arup	March 2012
Network Rail's Efficient Enhancement Expenditure	Steer Davies Gleave	March 2012
Scope for improvement in the efficiency of Network Rail's expenditure on support and operations: supplementary analysis of productivity and unit cost change	CEPA	March 2012
Corporate Finance advice on proposals for Network Rail to raise risk capital. Paper 4: Approach to Cost of Capital and Financing	RBC Capital Markets	March 2012
Review of Analysis in Network Rail's 'Freight Cap' Consultation	Arup	May 2012
The Impact of Changes in Access Charges on the Demand for Coal	NERA	May 2012
Review of Network Rail's Supply Chain Management	Civity	May 2012
Network Rail Project and Programme Management Capability	Halcrow	May 2012
IIP Tier 0 & 1 Model Audits	Arup	June 2012
Response to Network Rail Consultation: Variable Usage Charge Estimates and Freight Caps	Morgan Tucker consulting engineers	June 2012
Impact of changes in track access charges on freight traffic. Stage 2 Report: Impact of increases of above 100% on specific commodities.	MDS Transmodal	July 2012
Assessment of Network Rail's CP4 and CP5 savings - Asset Management Segment	Civity	July 2012
Possession Management Review for PR13	Lloyd's Register Rail	July 2012
North West Electrification Programme Management Review	Nichols	July 2012
Review of CP4 Regulated Outputs	Arup	August 2012
RM3 Evaluation of the capability of Network Rail to deliver its Operating Strategy Programme	ORR	September 2012

Consultancy / reporter study	Consultancy/ reporter firm	Date
Update to 'The Impact of Changes in Access Charges on the Demand for Coal' May 2012 NERA assessment	NERA	October 2012
Review of Network Rail VTISM modelling and allocation to market segments for Freight Avoidable Costs	Arup	November 2012
Reduction in Schedule 4 and 8 payment rates	Steer Davies Gleave (SDG)	November 2012
EC4T Transmission losses (AC and DC): Estimate review, final report	AMCL	December 2012 * published in April 2013
Econometric Benchmarking and its uses by ORR: a review	Jon Stern	January 2013
Analysis of road and rail costs between coal mines and power stations	MDS Transmodal	January 2013
Review of Network Availability Forecasts in SBP	Arup	February 2013
Innovation efficiency study	RailKonsult	March 2013
Review of asset management best practice - Inspections and Maintenance	RailKonsult	March 2013
ERTMS Programme Review	Halcrow	March 2013
Review of Network Availability Alternative Metrics	Arup	March 2013
Check of Network Rail's HLOS capacity metrics for CP4 and CP5	Arup	April 2013
Review of Network Rail's Access Charge Supplement Calculation	Arup	April 2013
Review of Network Rail's SBP infrastructure enhancement proposals for CP5	Nichols	April 2013
Review of Coal Spillage Charge	Arup	April 2013
International benchmarking of Network Rail's operations and support functions expenditure	Civity	April 2013
HLOS performance and reliability analysis and targets	Nichols	April 2013
PR13 Maintenance and Renewals Review	AMCL	May 2013

Consultancy / reporter study	Consultancy/ reporter firm	Date
Audit of Asset Data Quality	Arup	May 2013
PR13 Maintenance and Renewals Review • Summary report • Policy and WLCC Model Review	Arup	May 2013 June 2013
Review of Network Rail's carbon reduction calculations and CP5 trajectory	Arup	May 2013
Cost of Capital	CEPA	May 2013
Property Income	DTZ	May 2013
Assessment of Network Rail's Management of Inflation	Credo	May 2013
Benchmarking employment costs at Network Rail: A research report for the Office of Rail Regulation (ORR)	Incomes Data Services (IDS)	May 2013
Insurance	Willis	May 2013
2013 SBP AMEM Assessment	AMCL	May 2013
PR13 review of Network Rail's Maintenance & renewal unit costs used in planning	Arup	June 2013
Bottom-up benchmarking review - 2012 update	Arup	June 2013
Standards Efficiency Study	Nichols	June 2013
PR13 review of Network Rail CP5 efficiency proposals	Arup	June 2013
Rail Specific Plant - Review of Investment Case	Halcrow	July 2013
Update report on the scope for improvement in the efficiency of Network Rail's expenditure over CP5.	CEPA	June 2013
Scope for improvement in the efficiency of Network Rail's expenditure on support and operations: supplementary analysis of productivity and unit cost change.	CEPA	June 2013
Model Audit Report	PKF	June 2013
Assessment of EAU charge proposals: PR13 review	AMCL	June 2013
Update of Schedule 8 payment rates	Halcrow	June 2013

Consultancy / reporter study	Consultancy/ reporter firm	Date
Final report on recalibration of Schedule 8 benchmarks and update of payment rates	Halcrow	August 2013

Annex I: PR13 stakeholder engagement

Introduction

I.1. This annex gives an overview on the engagement we have carried out with stakeholders throughout PR13.

Our consultations and supporting workshops

I.2. Table I.1 below sets out all of our consultations during the course of PR13 and the main workshop events held by us.

Table I.1

Published document	Purpose / workshops / seminars
Periodic review 2013: First consultation document, May 2011	The purpose of this document was to: • explain the context, process and timetable for the review to allow stakeholders to plan their engagement; • set out our objective for PR13; and • consult on a range of key issues relating to the approach we will take to determining Network Rail's outputs and access charges for CP5. **Supporting workshops** As part of the consultation process, we held workshops in Edinburgh (5 July 2011); Cardiff (11 July 2011), London (12 July 2011) and Manchester (21 July 2011). During and after this consultation we also held sessions focused on particular areas to help us develop our thinking: • a workshop on the Schedule 8 performance regime on 25 July 2011; • workshops on efficiency benefit sharing and capacity utilisation on 23 September 2011; and • a workshop on the Schedule 4 possessions regime on 11 November 2011.

Published document	Purpose / workshops / seminars
Establishing Network Rail's efficient expenditure PR13 consultation, July 2011	The purpose of this document was to explain our approach to establishing the level of efficient expenditure for Network Rail in CP5, including the methods we intended to use, the range of studies we intended to undertake and the work Network Rail would do in this area. We held a workshop on this consultation on 21 September 2011. We also held a follow-up workshop on 26 October 2012 to update industry stakeholders on the progress of our work on assessing the efficient levels of expenditure for Network Rail, including how we planned to assess efficient expenditure elements of Network Rail's SBP once it was published in January 2013
Invitation to comment on the Initial industry plans, September 2011	This was not a formal consultation, but an opportunity for stakeholders to support and inform ORR's analysis of the Initial industry plans (IIPs) produced by Network Rail and the industry. Our analysis of the IIPs was a key input into our advice to ministers documents, published in March 2012. We also provided all the responses to Network Rail, DfT and Transport Scotland to help feed into their planning work for the HLOSs and SBP.
Consultation on the potential for increased on-rail competition, October 2011	This consultation asked for stakeholder views on the potential for increased on-rail competition.
Consultation on incentives, December 2011	This document followed up our May 2011 consultation document and set out more detailed issues and proposals relating to incentives as part of our work on PR13. We held a workshop on 9 January 2012 to discuss the issues raised in our incentives consultation.
Advice to ministers & ORR's requirements for Network Rail's strategic business plan, March 2012	These documents set out our advice to Scottish Ministers and the Secretary of State on Network Rail's costs and outputs for control period 5 ('CP5'). This was to inform the decisions that the two governments would make on what they wanted the railways to achieve in CP5 and the public funds required to deliver this when they published their 'high-level output specification' (HLOS) and 'statement of funds available' (SoFA). We also issued our requirements to Network Rail for its strategic business plan.
Setting the financial and incentive framework for Network Rail in CP5, May 2012	This document concluded on a number of issues raised in three previous consultations: • our first consultation on PR13; • consultation on the potential for increased on-rail competition; and • our consultation on incentives.

Published document	Purpose / workshops / seminars
Aligning incentives to improve efficiency: update and further consultation, May 2012	This provided an update, following the first consultation on PR13 and the consultation on incentives, on our position on the introduction of route-level efficiency benefit sharing (REBS) in CP5. It sought views on the options for how REBS would interact with alliancing. We also sought views on proposals to introduce a regulatory mechanism to expose train operators to changes in Network Rail's costs at future periodic reviews, and an alternative proposal for exposing franchised train operators to changes in the variable usage charge.
Consultation on the variable usage charge and a freight specific charge, May 2012	This consultation sought views on the likely scale of the variable usage charge for CP5, in order for us to establish a cap on the average level of the variable usage charge. We also consulted on the introduction of a new track access charge for certain rail freight commodities to recover infrastructure costs caused by freight operating on the network that are not currently recovered from other freight charges. We held a workshop on 18 May 2012 and a follow-up workshop on 5 July 2012 to give stakeholders the opportunity to ask questions and discuss our proposals. We also held a number of meetings with stakeholders on issues relating to this workstream.
Network Rail's output framework for 2014-19, August 2012	Following the two HLOSs, this consultation sought views on: the outputs that we should Network Rail for CP5; the main indicators we would use to monitor Network Rail; and the enablers (measures of Network Rail's capability to deliver). We held a workshop on this consultation on 7 September 2012.
Consultation on financial issues for Network Rail in CP5, August 2012	This document consulted on detailed issues relating to the financial framework that would apply to Network Rail in CP5, such as our approach to inflation risk. We held a workshop to discuss the consultation on 5 September 2012.
Consultation on Schedules 4 and 8 possessions and performance regimes, November 2012	Following up on high-level decisions taken through previous consultations, this document sought views on a range of detailed issues relating Schedules 4 and 8 of track access contracts (the compensation train operators receive for the financial impact of planned and unplanned rail service disruption attributable to Network Rail or other train operators). We held a workshop on this consultation on 16 January 2013
Consultation on financial issues for Network Rail in CP5: decisions, December 2012	This concluded on our consultation issued on 1 August 2012.
Volume incentive consultation, December 2012	This consultation set out our package of proposals to improve the effectiveness of the volume incentive. We held a focused industry seminar on this on 28 January 2013

Published document	Purpose / workshops / seminars
Aligning incentives to improve efficiency: decisions, December 2012	This concluded on our consultation issued on 3 May 2012.
Invitation to comment on Network Rail's strategic business plan, January 2013	Whilst not a formal consultation, we sought stakeholders views on Network Rail's SBP documentation to help inform our analysis. We also held a stakeholder workshop on 13 February 2013 at which Network Rail presented its SBP and we chaired a discussion.
Conclusions on the average variable usage charge and a freight specific charge, January 2013	This document concluded on our May 2012 consultation on the variable usage charge and a freight specific charge.
Consultation on a freight specific charge for biomass, February 2013	This consultation was issued following the conclusions document issued on 11 January 2013.
Consultation on electricity for traction charges for control period 5, April 2013	This consultation followed-up our high-level decisions on traction electricity charges in our *Setting the financial and incentive framework for Network Rail in CP5* document from May 2012. In particular, it sought views on the assumed levels of transmission losses for CP5 and how we proposed to reform the volume wash-up.
Consultation on contingency planning for PR13 implementation, April 2013	This set out our proposed approach in the event of a delay to the statutory implementation process.

Other engagement

I.3. As infrastructure manager, Network Rail has carried out significant engagement and consultation as part of PR13, particularly in respect of access charges. This work informed its submissions to us. Its website sets out details of this engagement[425]. We have been involved in this work, including through attendance of industry working groups relating to charges, such as the variable track access charge group, capacity charge working group and traction electricity steering group (TESG). Further detail on this is set out in chapter 16 relating access charges.

I.4. We also established industry working groups to discuss issues relating to specific PR13 issues. This includes for example the 'Schedules 4 and 8 for passenger

[425] http://www.networkrail.co.uk/publications/delivery-plans/control-period-5/periodic-review-2013/pr13-closed-consultations/.

operators' industry group' and 'Schedules 4 and 8 for freight operators' industry group'. These discuss technical and policy issues relating to the update of Schedules 4 and 8 possessions and performance regimes for passenger and freight operators.

I.5. Besides this, we have held many regular and ad-hoc bilateral and multilateral meetings with stakeholders over the course of PR13. This includes the 'QUADs' group which has met since late 2011 to discuss key issues relating to PR13. The QUADs group consists of DfT, Transport Scotland, ATOC, the Rail Freight Operators' Association, Network Rail and ORR.

Annex J: ORR's statutory duties

Introduction

J.1. We have a number of statutory duties which we must balance when exercising our economic functions. These duties are not in any order of priority and do not point in any one direction. In reaching our decisions, we have considered all of our statutory duties and weighed them as we considered appropriate.

Our statutory duties

J.2. We have the following duties under Section 4 of the Railways Act 1993:

- To promote improvements in railway service performance;
- Otherwise to protect the interests of users of railway services;
- To promote the use of the railway network in Great Britain for the carriage of passengers and goods, and the development of that railway network, to the greatest extent which we consider economically practicable;
- To contribute to the development of an integrated system of transport of passengers and goods;
- To contribute to the achievement of sustainable development;
- To promote efficiency and economy on the part of persons providing railway services;
- To promote competition in the provision of railway services for the benefit of users of railway services;
- To promote measures designed to facilitate the making by passengers of journeys which involve use of the services of more than one passenger service operator;
- To impose on the operators of railway services the minimum restrictions which are consistent with the performance of our functions under Part 1 of the Railways Act 1993 or the Railways Act 2005 that are not safety functions;
- To enable persons providing railway services to plan the future of their businesses with a reasonable degree of assurance;

- To take into account the need to protect all persons from dangers arising from the operation of railways;
- To protect the interests of users and potential users of services for the carriage of passengers by railway provided by a private sector operator, otherwise than under a franchise agreement, in respect of the prices charged for travel by means of those services, and the quality of the service provided;
- To have regard to the effect on the environment of activities connected with the provision of railway services;
- To protect the interests of persons providing services for the carriage of passengers or goods by railway in their use of any railway facilities which are for the time being vested in a private sector operator, in respect of the prices charged for such use and the quality of the service provided;
- In the case of our safety functions other than those we have as an enforcing authority for the purposes of the Health & Safety at Work etc. Act 1974, to have regard to any general guidance given to us by the Secretary of State about railway services or other matters relating to railways;
- To act in a manner which we consider will not render it unduly difficult for persons who are holders of network licences (i.e. Network Rail) to finance any activities or proposed activities of theirs in relation to which we have functions;
- To have regard to any notified strategies and policies of the National Assembly for Wales, so far as they relate to Welsh services or to any other matter in or as regards Wales that concerns railways or railway services;
- To have regard to the ability of the National Assembly for Wales to carry out the functions conferred or imposed on it by or under any enactment;
- To have regard to any general guidance given by the Secretary of State about railway services or other matters relating to railways;
- To have regard to any general guidance given by Scottish Ministers about railway services wholly or partly in Scotland or about other matters in or as regards Scotland that relate to railways and when doing this to give appropriate weight to the extent (if any) to which the guidance relates to matters in respect of which expenditure is to be or has been incurred by Scottish Ministers;

- To have regard to the funds available to the Secretary of State for the purposes of his functions in relation to railways and railways services;
- To have regard to the ability of the Mayor of London and Transport for London to carry out the functions conferred or imposed on them by or under any enactment;
- To have regard, in particular, to the interests of persons who are disabled in relation to services for the carriage of passengers by railway or to station services; and
- To have regard to the interests, in securing value for money, of the users or potential users of railway services, of persons providing railway services, of the persons who make available the resources and funds and of the general public.

J.3. We also have duties under other legislation, as follows:

- Section 17 of the London Olympic Games and Paralympic Games Act 2006 provides that section 4(1) of the Railways Act 1993 shall be treated as including the objective of facilitating the provision, management and control of facilities for transport in connection with the London Olympics. We do not consider this duty will be relevant for CP5.
- Section 21 of the Channel Tunnel Rail Link Act 1996 gives us an overriding duty to exercise our regulatory functions in such a manner as not to impede the performance of any development agreement. We do not expect this duty to be engaged as part of PR13.
- Section 22 of the Crossrail Act 2008 provides that section 4(1) of the Railways Act 1993 shall be treated as including the objective of facilitating the construction of Crossrail.
- Section 72 of the Regulatory Enforcement and Sanctions Act 2008 requires us to keep our functions under review and secure that in exercising these functions that we do not:
  - impose burdens which we consider to be unnecessary, or
  - maintain burdens which we consider to have become unnecessary.

J.4. We also have an equalities duty under Section 149 of the Equality Act 2010 which requires us in the exercise of our functions to have due regard to the need to:

- eliminate discrimination, harassment, victimisation and any other conduct that is prohibited by or under that Act;
- advance equality of opportunity between persons who share a relevant protected characteristic[426] and persons who do not share it; and
- foster good relations between persons who share a relevant protected characteristic and persons who do not share it.

[426] relevant protected characteristics are – age; disability; gender reassignment; pregnancy and maternity; race; religion or belief; sex; and sexual orientation.

Abbreviations and acronyms

Access and Management Regulations	Railways Infrastructure (Access and Management) Regulations 2005
ACS	Access Charge Supplement
ADIP	Asset Data Improvement Programme
AICR	Adjusted interest cover ratio
AMEM	Asset Management Excellence Model
AMIP	Asset Management Improvement Plan
ATOC	Association of Train Operating Companies
BTP	British Transport Police
BTPA	British Transport Police Authority
CAF	Cost analysis framework
Capex	Capital expenditure
CaSL	Cancellations and Significant Lateness (where significant lateness means more than 30 minutes late)
CEFA	Civil Engineering Framework Agreement
CIRAS	Confidential Incident Reporting & Analysis System
CLG	Company limited by guarantee
COLS	Corrected Ordinary Least Squares
CP3	Control period 3 (which ran from 1 April 2004 to 31 March 2009)
CP4	Control period 4 (1 April 2009 – 31 March 2014)
CP5	Control period 5 (1 April 2014 to 31 March 2019)
CP6, CP7 & CP11	These are control periods 6, 7 and 11 (assuming five year control periods)
CPI	Consumer Prices Index
CRRD	Congestion-Related Reactionary Delay
CUI	Capacity Utilisation Index
DECC	Department of Energy and Climate Change
DfT	Department for Transport
DST	Decision Support Tool
EBM	Estimated business miles
EBSM	Efficiency benefit sharing mechanism

EC4T	Electric current for traction
EGIP	Edinburgh – Glasgow Improvement Programme
ERTMS	European Rail Traffic Management System
ESI	Electricity Supply Industry
ESTA	Electricity Supply Tariff Area
ETCS	European Train Control System
EUAC	Electrification Asset Usage Charge
FDM	Freight Delivery Metric
FIM	Financial indemnity mechanism
FMS	Fault management system
FOC	Freight operating company
FOL	Freight only line
FPIP	Freight performance improvement plan
FSC	Freight specific charge
FTAC	Fixed track access charge
FTN	Fixed Telecoms Network
FVA	Financial Value Added
GEOGIS	Geographic and Infrastructure System
GJT	Generalised journey time
GSM-R	Global System for Mobile communications – Railways
HLOS	High-level output specification
HS1	High Speed 1
HS2	High Speed 2
ICM	Infrastructure cost model
IDP	Integrated Drainage Project
IDS	Incomes Data Services
IEP	Intercity Express Programme
IIP	Initial industry plan
ISBP	Industry strategic business plan, published in January 2013
JNAP	Joint Network Availability Plan
JPIP	Joint Performance Improvement Plan
KPI	Key performance indicator
LADS	Linear Asset Decisions Support

LEMS	Labour, Energy, Materials and Services cost measure
LENNON	'Latest earnings nationally networked over night' – the rail industry's central ticketing system
LICB	Lasting infrastructure costs benchmarking
LMDSM	Light maintenance depot stewardship measure
LTC	Station long term charge
MAA	Moving annual average
May 2011 document	Our '2013 Periodic review: first consultation' document, published in May 2011
MRE	Marginal revenue effect
MRR	Maintenance, repair and renewal
NDS	National Delivery Service
NOS	National Operating Strategy
NPS	National Passenger Survey
NRT	Network Rail telecoms
OLE	Overhead line equipment
OM&R	Operating, maintenance and renewals
OMA	Opex Memorandum Account
Opex	Operating expenditure
ORBIS	Offering Rail Better Information Services
ORR	Office of Rail Regulation
OSTI	Other single till income
PAYG	Pay-as-you-go
PDFH	Passenger Demand Forecasting Handbook
PDI-F	Possession Disruption Index - Freight
PDI-P	Possession Disruption Index - Passenger
PIM	Precursor Indicator Model
PLBEs	Principal load bearing elements
PPM	Passenger Performance Measure
PPP	Purchasing Power Parity
PR08	The 2008 periodic review (relating to CP4)
PR13	The 2013 periodic review (relating to CP5)
PR14	The 2014 periodic review of High Speed One (HS1)
PR18	The 2018 periodic review of Network Rail (relating to CP6)

PTEG	Passenger Transport Executive Group
QX	Qualifying expenditure (for stations)
R&D	Research and development
RAB	Regulatory asset base
RAGs	Regulatory accounting guidelines
RCM	Remote condition monitoring
RDG	Rail Delivery Group
REBS	Route-level efficiency benefit sharing mechanism
REEM	Real economic efficiency measure
RFOA	Rail Freight Operators' Association
RFG	Rail Freight Group
RIPG	Rail Industry Planning Group
RM3	Railway Management Maturity Model
ROSCO	Rolling stock leasing company
RPI	Retail prices index
RSSB	Railway Safety and Standards Board
RUOE	Real Unit Operating Expenditure
RVfM study	The Rail Value for Money study, led by Sir Roy McNulty
SBP	Network Rail's strategic business plan
SEUs	Signalling equivalent units
SFA	Stochastic frontier analysis
SFN	Strategic Freight Network
SICA	Signalling Infrastructure Condition Assessment
SISS	Stations Information and Security Systems
SLA	Service Level Agreement
SoFA	Statement of funds available
SPD	Sustained Planned Disruption
SPP	Sustained Poor Performance
SRS	Strategic Route Sections
SSM	Station Stewardship Measure
TESG	Traction Electricity Steering Group
TFP	Total Factor Productivity
The Act	The Railways Act 1993

TMS	Traffic Management System
TOC	Train operating company
TSIs	Technical Specifications for Interoperability
UIC	International Union of Railways
VTISM	Vehicle Track Interaction Strategic Model
VUC	Variable Usage Charge
WACC	Weighted average cost of capital