

Periodic review 2008



Determination of Network Rail's outputs and funding for 2009-14



OFFICE OF RAIL REGULATION

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Foreword

Challenges and opportunities

Measured in many ways, Britain's railways have rarely been more successful. Passenger kilometres are greater than at any time since 1946, on a network that is nearly half the size. Freight traffic has also grown strongly since privatisation. Train performance on most parts of the network has improved considerably, with 9 out of 10 passenger trains arriving at their destination on time despite increasing congestion. Safety indicators continue to show steady improvement, with rail being the safest mode of travel in Britain (measured in terms of passenger kilometres). There has been significant investment in the infrastructure and rolling stock. Network Rail has improved the efficiency of operating, maintaining and renewing the network over the last five years by nearly 30%. And rail is an environmentally friendly mode of travel. All this has led to increased levels of passenger and freight customer satisfaction.

Evidence shows that there remains significant room for further improvement. Improvements will need to be made by Network Rail, and the rail industry more widely, if the opportunities and challenges that lie ahead are to be addressed successfully. Passenger and freight traffic are expected to continue to increase significantly and customer expectations in terms of reliability, safety, comfort, and value for money will similarly grow. As passenger demand for weekend travel continues to grow, there are increasing expectations that the railways will be open for business for longer, thereby necessitating different and more efficient ways of managing the infrastructure. This will need to be achieved alongside continued improvement in passenger and worker safety and accommodating the different needs of freight customers. As other transport modes continue to reduce their emissions through the use of new technology, rail will also need to find ways of improving its environmental performance if it is to maintain its relative environmental advantage.

However, as it stands today, and despite the progress made over the last five years, the railway remains too expensive to take full advantage of the opportunities. If the opportunities are to be grasped fully, there will need to be significant further improvements in efficiency.

2008 periodic review

It is against this backdrop that we have, over the last three and a half years, undertaken our periodic review of Network Rail's outputs and track and station access charges. We have conducted the review transparently and engaged closely with Network Rail and the rest of the industry. We have

consulted extensively on all the important issues and received and considered many substantive and worthwhile contributions from interested parties. We have undertaken detailed and thorough reviews and challenge of Network Rail's plans and carried out further extensive work ourselves to inform our determination for the next five-year control period – 1 April 2009 to 31 March 2014.

In June 2008 we published for consultation our draft determinations of Network Rail's outputs and access charges for 2009-14. In making our determination we have considered carefully all the responses we received as well the implications of current turmoil in the financial markets. This has led us to make a number of specific changes that increase the level of Network Rail's revenue requirement and modify the regulatory framework compared to our draft determinations.

Our determination of Network Rail's outputs and access charges for 2009-14 forms a balanced package of decisions. The other parts of the package include the licence obligations; the monitoring and enforcement of the outputs, the financial framework and the protections for Network Rail against risks and uncertainties; and the contractual and incentive arrangements. We expect the package to be considered and judged as a whole. We have established it carefully, based on strong evidence, to ensure that Network Rail improving, as it should, will be able to finance its activities. We consider that our new incentive arrangements and regulatory protections strike the right balance between risk and reward and will encourage Network Rail, working with its industry partners, to outperform our determination, whilst delivering all the required improvements in train performance, safety and capacity.

Network Rail has committed itself to becoming a world-class company through transforming its processes and developing the skills and competencies of its workforce. We strongly support this objective and welcome the initiatives that the company has set out in its plans for 2009-14. However we remain convinced from the evidence we have collected and the analysis we have undertaken in the periodic review, notwithstanding the substantial comments from Network Rail and its advisers, that in order to become world-class, Network Rail must make bigger and faster improvements than it has proposed. Our determination therefore both challenges and incentivises Network Rail to work together effectively with its industry partners in order to respond to the challenges to improve capacity, train performance and safety, whilst driving further improvements in efficiency than it has proposed.

The scale and pace of change required means that Network Rail will need to ensure that it has sufficient capability, including the strength in depth and customer focus of its management and employees. It will need to continue to develop the competencies of its people, manage safely new ways of working, including the introduction and use of new technologies, improve the long-term management of its assets and develop mutually beneficial, sustainable partnerships with its direct customers and suppliers. These improvements are all consistent with Network Rail's own vision of becoming a company that stands comparison with the best in the world.

The key requirements of our determination package, which do provide for all the high level output requirements set down by the Secretary of State for Transport and Scottish Ministers, are as follows.

Further improvements in train service performance

By March 2014 we require the percentage of passenger trains arriving on time (as measured by the public performance measure, PPM) to be at least 93% for London & South East services, at least 92% for long distance and regional services in England & Wales, and at least 92% in Scotland, thus meeting the specifications set by the governments. Delays caused to freight trains must reduce by more than 25% from current levels. Network Rail will be required to set out and meet, for each train operator, the year by year improvements in train performance to which it is committing, consistent with these high level requirements.

Providing for growth in passenger and freight demand

Network Rail will need to deliver projects across the network so that it can accommodate passenger demand growth of 22.5% (measured by passenger kilometres) in England & Wales, as well as further growth in Scotland. Further growth in freight of 30% is also forecast. There will be some large-scale projects delivering step changes in capacity and/or passenger experience, for example Thameslink, Reading, and Birmingham New Street, as well as many smaller scale schemes, such as more than 500 longer platforms to accommodate longer trains. The scale of the enhancement programme will be more than twice the level in the current control period. We are providing Network Rail with an incentive to provide extra capacity for growth in passenger and freight traffic if demand exceeds the minimum set out above.

Improvements in safety

Network Rail must comply with its legal safety obligations and we expect to see continuous improvements in the company's safety performance. The Secretary of State has specified a 3% reduction

in the risk of death or injury to passengers and rail workers from accidents on the railway for the whole of the British mainline network. Network Rail will need to work together with its partners to deliver the 3% target. Network Rail's ambition to become a world-class company should be a catalyst for it to achieve further significant improvements in its safety performance, paying particular attention to the safety of its own workforce and contractors.

Reduced levels of disruption

Network Rail will be required to plan, manage and execute its large maintenance and capital works programmes not only more efficiently but to ensure that the railway is open for as much of the time as possible and the level of disruption is reduced. We are introducing new measures of 'possessions disruption' and expecting significant reduction in disruption for passenger services and no worsening for freight services over the period 2009-14. In our determination we are providing funding for Network Rail to start to implement its 'seven-day railway' initiative, which will deliver the improvements in network availability.

Success in the next control period

As its regulator, we will assess Network Rail's success in the next control period by whether it achieves the outputs on time, as set out in our determination, and does so whilst meeting all its licence and statutory obligations (particularly its asset stewardship obligations). We would see this as the minimum and would expect Network Rail to work to outperform in delivering its outputs and efficiency improvement.

We will monitor Network Rail's progress in delivering the outputs and we will report publicly on this. If in the light of the information we collect we consider Network Rail appears likely to fall short of the timely delivery of an output, we will not hesitate to take action to require the company to address promptly its shortcomings. We will consider a culpable failure by Network Rail to deliver a specified output as a serious breach of its obligations.

In December 2008 following our consultation with interested parties, we will conclude our work on changes to Network Rail's licence to enhance and clarify its accountability to us and its stakeholders.

Our key assumptions in determining what we consider to be the reasonable revenues that Network Rail requires to deliver the specified outputs year by year and meet all its obligations are set out below.

Ever more efficient

Network Rail will need to deliver all of the above whilst becoming ever more efficient. We have undertaken detailed studies, benchmarking Network Rail's costs and processes against many international railways and other comparable

companies. The strong evidence we have collected shows clearly that there remains a very large potential for Network Rail to improve its efficiency.

Network Rail disputes much of our evidence base on the scope for efficiency improvement. We have reviewed the company's response to our draft determinations in detail and we have undertaken further work to assure ourselves that our judgements on efficiency, as part of the overall package, are robust. Whilst we still consider there is a very large potential for Network Rail to improve, we have made some changes to our efficiency judgements.

We are satisfied that it would be unrealistic to expect the company to achieve the full potential by 2013-14. In setting access charges, we have retained our assumption that Network Rail should, as a minimum, achieve two thirds of what we consider to be a reasonable view of the current efficiency gap between it and other infrastructure managers. This equates to a 21% improvement in operating, maintenance and renewals efficiency by 2013-14 compared to the start of the period. However, we have made some changes to our efficiency judgements compared to our draft determinations. The main changes are that we have now established separate improvement profiles for operating, maintenance and renewals expenditure and we have re-profiled the years in which this improvement is to be achieved. We have assumed that less will be achieved in the first two years with corresponding increases in the following three years. We have also recognised the need for some upfront efficiency enabling expenditure on information technology and employment terms and conditions to fit the company for its transformation. So, we are providing the company with more time to plan and implement the changes required to deliver the necessary changes without shifting the goal.

We consider that for a company aspiring to world-class status this level of improvement is achievable. Network Rail had proposed approximately 13% improvement in its strategic business plan. We also retain our expectations that the company will make significant increases in the efficiency with which it delivers its enhancement programme.

To enhance the achievement of efficiency in 2009-14, we will introduce the mechanism whereby train operators will be able to share a percentage of Network Rail's cost savings if it outperforms our determination. This is aimed at encouraging train operators to work with Network Rail to identify and facilitate the achievement of its full efficiency potential faster and further than we have assumed.

Expenditure, financing and income

In our determination we have assumed that Network Rail's expenditure over the control period on operating, maintaining, renewing and enhancing the railway network will be £28.5bn, 8% less than the £31.1bn the company proposed. After giving the

Network Rail's representations full consideration we have made changes to our assumptions on the level of expenditure required in 2009-14, which includes provision for the harmonisation of maintenance employment terms and conditions.

Conditions in the financial markets remain volatile, and in light of this we have made some changes to the allowed rate of return on Network Rail's regulatory asset base. The return we are setting for 2009-14 is 4.75%.¹ This provides for debt service costs, a fee to government for the guarantee it provides for Network Rail's existing debt, a financial buffer against unanticipated cost or revenue shocks, with the residual amount allocated to a 'ring fenced fund' that can be used in extreme conditions to deal with cost or revenue shocks. We are pleased to support Network Rail's plans to cap the use of the financial indemnity in the next control period and raise new debt (of around £4.4bn) which is not supported by the government guarantee. Given conditions in the financial markets we have now agreed to phase in the introduction of unsupported debt. Although the amount of unsupported debt will be lower than previously assumed, it is still a significant amount and will enhance the financial discipline on, and within, the company, as its financial and operational performance will come under much greater scrutiny from its actual and prospective lenders and the ratings agencies. The cost and availability of finance will be directly linked to the company's performance, thereby creating stronger incentives for it to operate efficiently. We are satisfied that in the medium to long term the benefits of ever strengthening corporate financial incentives will outweigh the higher costs of debt unsupported by government.

We have combined our expenditure and financial assumptions using the standard 'building block' approach, where renewals and enhancement expenditure is added to the regulatory asset base and amortised, to estimate Network Rail's total revenue requirement for the control period of £26.7bn. This is an increase of £0.2bn compared to our draft determinations. Our determination is £2.4bn (8%) less than the £29.1bn Network Rail asked for. Network Rail's income is principally recovered through track access charges paid by passenger and freight operators, station access charges, and network grant paid by the governments in England & Wales and Scotland to Network Rail in lieu of access charges.

The efficiencies that we judge Network Rail can achieve will lead to lower track access charges for train operators. Freight train operators will see their total charges fall by 35%.

Our determination delivers the high level outputs specified by the Secretary of State and Scottish Ministers and can be afforded with the public funds

¹ In real 'vanilla' terms (combining a pre-tax cost of debt and a post-tax cost of equity).

that they are making available to support the mainline railways in the control period.

We will require Network Rail to report to us regularly on the work it is doing, including the costs it is incurring and any changes in its asset policies as an aid to informing future determination decisions.

Delivery

We consider that Network Rail can deliver the improvements in performance and its capital expenditure programme for 2009-14 safely. While the company has made considerable progress in improving its capability, the challenges ahead are considerable. We support Network Rail's intention to bring together its many detailed initiatives into an overarching capability development programme with high level leadership.

In conclusion

On 18 December 2008 we will publish the final price lists and the review notices which starts the legal implementation of our determination. Following this, Network Rail will have until 5 February 2009 to decide whether it accepts or rejects the conclusions of the periodic review. If it rejects our determination then we expect to refer our determination to the Competition Commission. The Competition Commission would review all the evidence available and reach its own view on Network Rail's outputs, regulatory framework and access charges. Whilst any reference to the Competition Commission is in progress our determination will apply.

Our determination represents a positive outcome for passengers, freight customers and taxpayers. Network Rail, working with its industry partners, can and should deliver better outcomes at lower cost. As Network Rail and its partners meet the challenges we are setting down, the railway industry will strengthen its position to meet the longer term needs of its customers and to improve its competitive position against other modes of transport. The outlook for the railway industry is very encouraging. We are confident that Network Rail will grasp the opportunities it faces.



Bill Emery
chief executive
30 October 2008

Summary

2008 periodic review – overview

1. The 2008 periodic review (PR08) is the process whereby we determine the outputs that Network Rail Infrastructure Limited (Network Rail) must deliver, and the levels of access charges paid by train operators for use of its infrastructure, during the five years of control period 4 (CP4), which will run from 1 April 2009 to 31 March 2014.
2. The charges we are determining are the track access charges payable by franchised passenger and open access passenger and freight train operating companies, and the station long term charge payable by users of stations. We are also establishing the level of network grant that the governments in England & Wales and Scotland will pay to Network Rail in lieu of access charges.
3. In this document we set out our determination for outputs and access charges. We also explain the judgements we have made on Network Rail's costs and the revenue requirement that underpins the calculations of access charges and we set out the values of the incentive rewards that Network Rail and its industry partners can achieve if they outperform our determination.
4. In making our determination we have considered carefully all the responses we received to our draft determinations. We have also taken account of the most up-to-date information on Network Rail's financial performance and the expected outturn of control period 3 (1 April 2004 to 31 March 2009). We have made a number of changes to our draft determinations (an overview of the key changes is provided in table 11 at the end of this summary).
5. Our determination represents a balanced package that should be considered and judged as a whole. Alongside the outputs and access charges, the other key parts of the package are the obligations of Network Rail's licence, the new financial framework, the contractual and financial incentives, the protections to deal with risk and uncertainty, the structure of charges, and the monitoring and enforcement framework.
6. We expect Network Rail to improve significantly its outputs in CP4. These include continued improvements in safety, train performance and considerable increases in capacity to accommodate 22.5% growth in passenger demand in England & Wales (measured in passenger kilometres), and further passenger demand growth in Scotland. Growth of 30% in freight traffic is projected by the end of CP4. The company will extend more than 500 platforms to accommodate the approximately 10% increase in vehicles that will be introduced to accommodate the passenger growth.
7. We will actively monitor Network Rail's progress in delivering its output obligations and we will report on this publicly. If we believe that the company is failing, or is likely to fail, to meet its obligations we will investigate the matter fully and will take any action, including enforcement action, that is appropriate to address the problem.
8. Based on the evidence we have collected and the analysis we have undertaken in PR08 we have established the lowest level of access charges that we consider is reasonable for Network Rail to deliver all the required outputs and ensure that it is able to finance its activities.
9. Network Rail has committed itself to becoming a world-class company through transforming its processes and developing the skills and competencies of its workforce. We strongly support this objective and welcome many of the initiatives that the company has set out in its plans for CP4. However the evidence we have collected and the analysis we have undertaken in PR08 has convinced us that Network Rail must make bigger and faster improvements than it has proposed.
10. We consider that the outputs can be delivered at significantly lower cost than Network Rail has projected and we have factored demanding, but achievable, assumptions for efficiency improvement into our calculations of access charges. In its response to our draft determinations Network Rail challenged much of the evidence underlying our judgements on the scope for efficiency improvement. We have carefully reviewed Network Rail's response and those of other stakeholders and we have undertaken further analytical work ourselves. We are satisfied that our judgements are well evidenced, reasonable compared to what has already been achieved by Network Rail and appropriate for the circumstances it will be operating in and its longer term aspirations to be a 'world-class' company.
11. The judgements we have made on the scope for efficiency improvement in CP4 should not lead the company to compromise health and safety or create risks that are not capable of being managed. Indeed, in our view, there is no conflict between safety and efficiency, and a

world-class company will deliver high performance in all areas of its operations.

12. In this review we are strengthening the incentives acting on Network Rail to strive to outperform our determination. The efficiency improvements factored into our calculations provide the opportunity for the company, working with its industry partners, to do this. If they succeed, the company will benefit reputationally and there will be widespread financial benefits. Lower levels of expenditure will translate into lower access charges in the following control period and a share of the outperformance will be passed on to operators through charge rebates during CP4. For franchised operators to retain this benefit will require government to waive the terms of franchise agreements, which it has not yet consented to do. We will implement the mechanism and encourage all operators to work energetically in pursuit of outperformance, so that they produce clear evidence of the contribution they are making.
13. Another important change to the financial incentives on Network Rail is the capping of the financial indemnity that government provides Network Rail (guaranteeing all of its borrowings). We support Network Rail's proposals to raise new debt capital without the government guarantee. Following Network Rail's response to our draft determinations we agree, in light of current conditions in the financial markets, that it is appropriate to phase in introduction of unsupported debt over the course of CP4. We have confirmed that, in our view, this represents value for money, and consider that it should generate an additional spur on the company to reduce costs, due to the increased scrutiny that this will bring from ratings agencies and actual and prospective lenders to Network Rail and the need for Network Rail to maintain a solid investment grade credit rating to raise the volume of debt required in CP4.
14. We consider that our determination should allow our overarching objective for PR08 to be achieved: to ensure an outcome that secures value for money for users and taxpayers, by determining the level of Network Rail's access charges and outputs in a way that balances the interests of all parties. In terms of outcomes from the railway, if this objective is achieved it will deliver a railway that is safer than ever before, more reliable than ever before, carrying significantly more passengers and freight, at a cost that represents ever better value for money for users and taxpayers.

Background and approach

15. The legal procedure for conducting an access charges review is set out in schedule 4A to the Railways Act 1993. The central element of the

process is that the Secretary of State for Transport and Scottish Ministers have separately to tell us what they want to be achieved by railway activities during the control period and the public financial resources that are, or are likely to be, available for this. They did this by producing 'high-level output specifications' (HLOSs), setting out what they want to be achieved, and 'statements of the public financial resources available' (SoFAs), in July 2007.²

16. We have taken full account of the HLOSs and SoFAs in making our determination. We have also taken account of the reasonable requirements of all of Network Rail's customers and other funders, including open access passenger and freight train operators, to the extent that these are not covered by the government specifications.
17. Our determination is the result of more than three years work since August 2005 when we published our initial consultation document. There has been a significant amount of work undertaken across the industry over this time, involving detailed analysis and debate. From the start of the review we committed to conducting it transparently, exposing the issues and consulting on and explaining all of our key decisions. We are grateful for the positive engagement and all the contributions made by stakeholders throughout PR08.
18. We set out many of the general principles of the framework we use to set outputs and access charges in our advice to ministers and framework for setting access charges in February 2007, with further principles confirmed in our update on the framework for setting outputs and access charges in February 2008, and outstanding principles confirmed in our draft determinations in June 2008.
19. We follow the standard 'building block' approach used by economic regulators, a key feature being that renewals and enhancement expenditure is added to the regulatory asset base (RAB) and remunerated through the amortisation allowance and an allowed return on the RAB.
20. This revenue is recovered by track and station access charges, grants paid directly to Network Rail by government (in lieu of access charges) and income from other sources (such as property rental). Whilst Network Rail is a GB-wide company and finances itself on this basis, we have established separate calculations for

² The HLOS published by the DfT may be accessed at www.dft.gov.uk/about/strategy/whitepapers/whitepapercm7176/ and the HLOS published by Transport Scotland may be accessed at www.transportscotland.gov.uk/files/documents/rail/HLOS-July-2007.pdf.

England & Wales and Scotland, in the context of the separate responsibilities that the Secretary of State and Scottish Ministers have for setting the strategy for, and funding, the railways.

21. Whilst we have made our determination based on our assessment of the overall level of efficient expenditure we consider the company needs to undertake in CP4, we do not decide the detailed level, or pattern, of expenditure or activity that Network Rail should undertake. It is for the company to define and deliver its work programme consistent with its asset policies, actual asset condition, requirements of the network, and its licence, legal and contractual obligations.

Network Rail's progress and CP4 challenges and opportunities

22. When Network Rail took ownership of the rail infrastructure in 2002 from Railtrack (in administration), it faced a network where costs had spiralled and delays were far above the levels of a few years before. Since then the company has achieved a great deal in rectifying the problems it inherited. It has made good progress in improving performance, better understanding its assets and getting costs under control.
23. Looking ahead, the needs of the railway and its users present a fresh set of challenges. Further progress to reduce costs and improve performance towards 'world-class' levels must accompany delivery of a major programme of enhancements to increase capacity, using less intrusive means of carrying out engineering work to progress towards a 'seven day railway', and increasing responsiveness to the needs of its customers.
24. We consider that all this is achievable but it will require Network Rail to strengthen its management, to develop the skills and competencies of its people, to manage safely new ways of working, including the use of new technologies, to improve the long term management of its assets and to develop mutually beneficial and sustainable relationships with its customers and suppliers.

Network Rail's strategic business plan

25. At the end of October 2007 Network Rail published its strategic business plan (SBP), which was the company's principal submission to us in PR08. The SBP contains Network Rail's costed proposals for operating, maintaining, renewing and enhancing the rail infrastructure in CP4, along with assumptions on the financial framework. Network Rail produced the SBP in conjunction with its industry partners and it

made assumptions about the respective contributions of Network Rail and franchised train operators to delivering the requirements of the two HLOSs, as well as the reasonable requirements of all of its customers and funders. Following our initial review of the SBP, and response to the company, Network Rail published an update of its SBP at the beginning of April 2008. The SBP and the update have provided the basis for our review and challenge of the company's plans to underpin our determination. We have also taken account of the company's response to our draft determinations.

Outputs

26. A core part of PR08 has involved reviewing and improving the scope and definition of the outputs Network Rail needs to deliver. We require an increased level of disaggregation of outputs across the network in order to strengthen Network Rail's accountability to its customers.
27. In CP4 Network Rail's output obligations will include:
 - top-level regulated output obligations which are specified in this determination; and
 - disaggregated output obligations which will be fully defined in Network Rail's CP4 delivery plan, and secured through their status as being reasonable requirements. Some of these are already firm but others will need to be worked up by Network Rail and its stakeholders over the course of 2008.
28. The outputs we have established for CP4 are summarised in table 1.

Table 1: Summary of CP4 outputs

| Output | Description |
|---------------------------|---|
| Safety | Network Rail must continue to meet its health and safety obligations. In addition, the Secretary of State for Transport has specified a 3% reduction in the risk of death or injury to passengers and rail workers from accidents on the railway for the whole of the British mainline network to be achieved between 2008-09 and 2013-14. Network Rail will need to work together with its partners to deliver the 3% target. |
| Train service performance | By 2013-14 we expect Network Rail to deliver the improvements in the public performance measure (PPM) and the reductions in cancellations and significant lateness by sector as set out in the HLOS for England & Wales; and PPM as set out in the HLOS for Scotland. We are setting trajectories for each year of CP4 for these measures. We are also setting maximum levels, for each year, for the number of passenger train delay minutes for which Network Rail is held responsible in England & Wales and in Scotland. We are setting similar maxima for the freight train delay minutes for which Network Rail is held accountable across the network as a whole (normalised for the volume of freight traffic). Further detail is provided in tables 2 - 4 |
| Capacity | We expect Network Rail to deliver projects specified in the HLOSs for both England & Wales, and Scotland. We also expect it to deliver other |

| | |
|----------------------|---|
| | projects which will provide the infrastructure required to meet the disaggregated England & Wales capacity specifications. |
| Network capability | Baseline network capability will be as defined at 1 April 2009. Network Rail must deliver increased capability consistent with the enhancement schemes specifically funded in this determination. |
| Station condition | The average condition of each category of station on the network, and the average condition for all stations in Scotland, should at least be maintained (before taking into account improvements funded through the national stations improvement programme (NSIP)). |
| Network availability | Network Rail must reduce disruption to passengers from planned engineering works in accordance with a trajectory leading to a 37% reduction by 2013-14, and must ensure no increase in disruption to freight services, as measured by possessions disruption indices. |

29. The required trajectories for train service performance are shown in tables 2 – 4. The CP4 targets required by the HLOSs are in shaded cells in **bold**.

Table 2: Public performance measure for passenger operators (annual average)

| | 2008-09 forecast (%) | CP4 | | | | |
|--|----------------------------|----------------|----------------|----------------|----------------|----------------|
| | | 2009-10 (%) | 2010-11 (%) | 2011-12 (%) | 2012-13 (%) | 2013-14 (%) |
| England & Wales (by sector) - minimum | | | | | | |
| Long distance | 87.6 | 88.6 | 89.8 | 90.9 | 91.5 | 92.0 |
| London & South East | 91.2 | 91.5 | 92.0 | 92.4 | 92.7 | 93.0 |
| Regional | 90.1 | 90.5 | 91.0 | 91.5 | 91.9 | 92.0 |
| Total | 90.6 | 91.0 | 91.5 | 92.0 | 92.3 | 92.6 |
| Scotland | | | | | | |
| First ScotRail | 90.6 | 90.9 | 91.3 | 91.7 | 91.9 | 92.0 |

Table 3: Cancellations and significant lateness (England & Wales only)

| | % of services affected - maximum | | | | | |
|---------------------|----------------------------------|---------|---------|---------|---------|---------|
| | 2008-09 forecast | CP4 | | | | |
| | | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
| Long distance | 5.3 | 4.9 | 4.5 | 4.2 | 4.0 | 3.98 |
| London & South East | 2.3 | 2.3 | 2.2 | 2.1 | 2.0 | 2.0 |
| Regional | 2.7 | 2.6 | 2.5 | 2.4 | 2.3 | 2.32 |

Table 4: Network Rail delay minutes for passenger and freight services

| | 2008-09 forecast | CP4 | | | | |
|--|------------------|-----------|-----------|-----------|-----------|-----------|
| | | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
| Passenger services (delay minutes) - maximum | | | | | | |
| England & Wales | 6,500,000 | 6,270,000 | 5,790,000 | 5,430,000 | 5,190,000 | 4,980,000 |
| Scotland (First ScotRail) | 455,000 | 436,000 | 410,000 | 391,000 | 386,000 | 382,000 |
| Freight services (delay minutes per 100 train km) - maximum | | | | | | |
| Total | 3.92 | 3.68 | 3.41 | 3.18 | 3.05 | 2.94 |

Efficient expenditure

30. We have collected a wide range of evidence and carried out a thorough and detailed assessment of Network Rail's proposals for its operating, maintenance, renewals and enhancement expenditure to inform our assessment of the level of activity we consider Network Rail needs to undertake and the scope for efficiency improvement.

Maintenance and renewals

31. We have assessed Network Rail's projections for CP4 of £12.9bn for renewals and £5.3bn for maintenance (before adjustment for efficiency improvement).³ This proposed expenditure covers the upkeep through day-to-day maintenance and renewals of the network's physical infrastructure. We have reviewed the justification for the activity levels that drive this expenditure, including:

- assessing each of the policies by which the assets will be managed;
- understanding how activity levels and planned outputs are linked, including the extent to which Network Rail has made the case for increased expenditure where it argues that existing levels are insufficient to sustain the network in the long term;

- considering the deliverability of planned activity volumes; and
- conducting 'on-the-ground' sampling of certain activities planned for the early part of CP4 to test whether or not the decision making processes are generating robust work plans that are clearly driven by the asset policies.

32. Our views on the robustness of the activity levels Network Rail proposed in its SBP fall into five broad categories:

- track, signalling, telecoms and plant & machinery renewals (61% of Network Rail's proposed renewals expenditure): Network Rail's asset policies are clear and its modelling of CP4 renewals activities is relatively robust. Proposed activity levels are in line with current levels. In some cases we have made adjustments based upon evidence that there is a small degree of over-scoping of renewal plans;
- electrification and operational property (17% of proposed expenditure): The asset policies are clear and we consider that the renewals volumes have been well modelled, but the proposed CP4 volumes are significantly higher than current levels. We have made relatively minor adjustments to volumes in these areas, although Network Rail made a major reduction in proposed operational property expenditure between the SBP and

³ All monetary values are in 2006-07 prices unless otherwise stated.

its update following our questioning of the original figures;

- civil engineering expenditure plans (17% of proposed expenditure): Network Rail has proposed significant increases in activity but has failed to substantiate its case. We have therefore adopted substantially lower figures which in most cases represent activity at the level being delivered in the final part of CP3;
 - for IT/corporate accommodation and sundry 'discretionary' renewal expenditure Network Rail provided further justification for its proposals in response to our draft determinations and we have accepted some of the company's arguments for this expenditure; and
 - maintenance: we consider that, for all asset categories, Network Rail's proposals are reasonable. Compared to our draft determinations, we have increased our provision for maintenance expenditure to account for Network Rail's projected costs of harmonising maintenance employment terms and conditions across the company. Although the issue was identified, no costs were included in the SBP or the SBP update: Network Rail submitted estimates to us in its response to the draft determinations.
33. Since our draft determinations, Network Rail has advised us of further deferral of renewals activity from CP3 to CP4. We have assessed this information and have made provision for this to be funded in CP4 where we believe this is appropriate and realistic. This will be taken into account in determining the level of the RAB at the end of CP3.
34. The result of our assessment is to reduce the provision for CP4 renewals from £12.9bn in the SBP update to £12.5bn (a 4% reduction) before allowing for the effect of efficiency. This reduction is around £300m less than in our draft determinations, as we accept some of the arguments Network Rail has made. For maintenance is increased by £100m to £5.6bn.

Operating expenditure

35. Network Rail has proposed controllable operating expenditure (excluding maintenance) of £3.8bn and non-controllable opex of £1.8bn in CP4. We have largely accepted Network Rail's projections for non-controllable opex. On controllable opex, the main adjustment comes through our efficiency assessment discussed further below.

Operating, maintenance and renewals efficiency

36. Across OM&R, Network Rail has proposed efficiency improvements in CP4 of 17.6% before allowing for increases in the prices of labour and material inputs above general inflation. After

adjusting for input prices, its proposed overall CP4 efficiencies are 14% for maintenance and renewals and 7% for operating expenditure.

37. We have reviewed Network Rail's proposed efficiency initiatives for CP4 and we have undertaken considerable further work to assess the scope for efficiency improvement. We have considered very carefully the results from all the evidence available to us.
38. Whilst we acknowledge the transparent approach that Network Rail has undertaken to develop its proposals for CP4, ultimately we consider that the company significantly understates the scope for efficiency improvement.
39. Besides our review of Network Rail's plans, key work we have undertaken to inform our judgements is:
- maintenance and renewals: working with Network Rail, we have conducted econometric analysis of the International Union of Railways (UIC) 'lasting infrastructure cost benchmarking' dataset, which comprises M&R expenditure and other data for 13 European rail infrastructure managers, including Network Rail, for the eleven years to 2006. This has generated robust results that show, re-based to the end of CP3, Network Rail is at least 35% less efficient in maintenance and renewals compared to the upper quartile of the other infrastructure managers. We have undertaken further engineering based work to understand this efficiency gap, including visits to rail infrastructure managers in other countries, and assessment of technologies and working methods used elsewhere in Europe that could be implemented by Network Rail to improve efficiency; and
 - operating expenditure: Oxera has conducted a study for us on the scope for efficiency improvements in Network Rail's operating expenditure, by looking at performance in other regulated utilities. Using this work, and other detailed studies, to consider the trend in rail operating expenditure also shows a gap of around 35% at the end of CP3.

The rate of improvement in OM&R efficiency in CP4

40. In making our determination we have considered both the total improvement that Network Rail can make and the speed at which it should be able to achieve this. We recognise the many challenges that the company faces in CP4 and the improvements it will need to make in train performance, safety and capacity, as well as in further cost savings. We have therefore decided to profile further significant efficiency improvements over longer than the five years of CP4. We recognise that many of the cost

savings the company needs to make to address the full efficiency gap may necessitate fundamental change to the way it operates and implementation of new technologies and working methods. Given the challenges Network Rail faces in CP4 it is right to give it sufficient time to achieve this.

41. We have examined the rate of change that other regulated industries have achieved and have considered some of the specific changes Network Rail could make to reduce its costs during CP4. We have taken into account Network Rail's own aspirations to achieve world-class status. We consider that Network Rail should be able to catch-up two thirds of the efficiency gap during CP4 (21% in OM&R) with the remaining third in CP5 (though we would expect to review the scope for further efficiency improvement in CP5 in more detail at the next periodic review).
42. To determine the overall level of efficiency improvement in CP4 we have also taken into account the ongoing productivity improvements ('frontier-shift') that even the best performing companies would expect to achieve, above that reflected in general inflation. Across OM&R we consider that this frontier-shift may be 3% in CP4 as a whole.
43. We have also made allowance for increases in Network Rail's input prices above general inflation, through adjustments to our efficiency assumptions based on the study Network Rail undertook. We have reduced our 'gross' efficiency assumptions by 4% for maintenance and renewals, and 8% for controllable opex.
44. Network Rail challenged our work on the scope for efficiency improvement in its response to our draft determinations. We have reviewed the company's arguments very carefully and we have conducted further work to assure ourselves that our judgements on the scope for efficiency improvement are reasonable.
45. We have made a number of changes to our conclusions on efficiency. Most importantly, in the light of Network Rail's representations, we have decided to re-profile our efficiency assumptions within CP4. We still assume that Network Rail will be able to achieve an 'exit rate' of 21% improvement, but we have back-ended the improvements. This provides Network Rail with more time to plan and implement the changes required (as well as providing a small increase in its revenue requirement). We have established separate profiles for maintenance and renewals and we also recognise that there are small amounts of expenditure in Network Rail's plan that are already post-efficient. We have also agreed, following Network Rail's representations, to log up or down to the RAB changes to our base

assumptions on renewals input prices during CP4, based on the outturn levels of the Department for Business, Enterprise and Regulatory Reform infrastructure output price index (IOPI).

46. Table 5 shows our conclusions on the minimum level of efficiency improvement (net of input prices) that we consider Network Rail should be able to achieve in CP4 for controllable operating expenditure, maintenance and renewals.

Table 5: Our assumptions for CP4 efficiency improvement

| | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total |
|-------------------|---------|---------|---------|---------|---------|-------|
| Controllable opex | 2.8% | 2.8% | 4.0% | 4.0% | 4.0% | 16.4% |
| Maintenance | 3.2% | 3.2% | 4.0% | 4.5% | 4.5% | 18.0% |
| Renewals | 5.0% | 5.0% | 5.5% | 5.5% | 5.5% | 23.8% |

Enhancement expenditure

47. Network Rail's SBP update proposes some £9bn of enhancement expenditure in CP4 to be funded through our periodic review. This work is a response to the requirements of the two HLOSs, other customer and funder reasonable requirements and the demand for a growing and sustainable railway. The expenditure is split between:
 - England & Wales: expenditure of £8.6bn in CP4 to deliver the HLOS, including schemes ranging from more than 500 platform extensions to deliver the capacity specification, investment to deliver the performance specification, specific major projects (Birmingham New Street, Reading, Thameslink) and other investment, including work to take forward implementation of the seven day railway concept; and
 - Scotland: including expenditure of £448m on projects specified by Transport Scotland in its HLOS (Airdrie to Bathgate and the Glasgow Airport Rail Link) and development funding for further enhancement schemes.
48. We have undertaken a detailed review of Network Rail's proposals. We have examined both the scope of the projects Network Rail has proposed and the efficiency of the work.
49. We reviewed Network Rail's proposals to deliver the capacity and performance specifications in the England & Wales HLOS. Many of the proposals to increase capacity are at an early stage of development. We have concluded that while Network Rail's proposals are generally appropriate and reasonable they can be delivered at lower cost. For the HLOS performance specification Network Rail made a case for additional funding to deliver the specification. We consider that the need is

smaller than Network Rail has proposed. We have included provision for expenditure of £220m for Network Rail to take forward implementation of the seven-day railway concept to provide greater levels of network availability for passengers.

50. For the DfT major projects specified in the HLOS (the major named schemes at Birmingham New Street, Reading and Thameslink) we have provided for the funding proposed in the HLOS which we found to be reasonable given the scope of the work.
51. We have agreed a structure for delivery of the national stations improvement programme, a ring-fenced fund to provide station improvements up to the value of £156m in CP4.
52. Network Rail has set out initial proposals for development of the strategic freight network. We have reviewed the company's proposals and we require it to develop more detailed plans with the industry, for expenditure up to a maximum value of £208m in CP4.
53. In Scotland we have approved funding for Airdrie to Bathgate at a broadly similar level to that proposed by Network Rail, although we consider that Glasgow Airport rail link could be delivered at a lower cost than it proposed.
54. In its response to our draft determinations, Network Rail challenged the majority of reductions we made. We have carefully reviewed the company's response and consider that it has not generally provided any new compelling evidence. However, we are making small increases on our expenditure assumptions for a number of schemes, including Gatwick airport and we are providing funding for the East Midlands signalling enhancement scheme.
55. Overall we consider that the enhancement programme funded through PR08 can be delivered for £7.6bn, 16% less than Network Rail has proposed. This is an increase of over £100m compared to our draft determinations.
56. Achieving the benefits of this programme also relies on government and train operators agreeing on new train orders, and a complex set of cascades of existing rolling stock around the country. The new trains have to be built and industry accepted procedures followed. The whole industry will have a role to play.

Network Rail's ability to deliver the CP4 capital programme

57. In CP4, Network Rail faces a major challenge to deliver the enhancement programme, which is more than twice as large as in CP3, as well as carrying out its core asset renewals work.

58. We have reviewed Network Rail's capability to deliver the capital programme. We have made a small reduction in the volume of signalling renewals funded because we do not believe Network Rail can deliver its proposed volumes and we have assumed more of the West Coast enhancement works cannot be completed until CP5 than assumed by Network Rail. Network Rail has itself proposed that its enhancement funding should be reprofiled so it receives less money in the first year of the control period and more in later years. We agree with this principle but we have increased the amount to be reprofiled to reflect our concerns about Network Rail's preparations for 2008-09.
59. While Network Rail has made considerable progress in improving its capabilities (including the skills and competencies of its people and the processes it uses to make decisions and progress capital expenditure) it recognises that it needs to develop these further. Network Rail cannot afford to lose momentum on its capability development and we need to monitor the company's programme to establish whether or not it is likely to deliver as we progress through CP3 and CP4. We are therefore requiring Network Rail to provide further regular information to us and we will commission further independent reviews as appropriate to maintain a sharp focus on this area.
60. We will be monitoring closely the progress of enhancement projects through the stages of scheme development, because slow project development risks delaying the programme.

Safety management

61. We have sought to ensure that our overall package of determinations will challenge and incentivise Network Rail to become more efficient in running its business, whilst continuing to meet its health and safety obligations.
62. We have examined Network Rail's plan to deliver health and safety in CP4. In particular we looked at how Network Rail has identified any changes in risk arising from the organisational and operational changes it needs to make to deliver its outputs and its plans for managing these changes in risk.
63. We consider that Network Rail should be able to deliver its required outputs in CP4 in compliance with its statutory obligations under the Health and Safety at Work Act 1974 and associated legislation. However, delivery of the determination presents challenges for Network Rail, particularly in light of the changes in efficiency, capacity and performance being asked of the railway during CP4. These will require Network Rail to undertake a number of major, and in some cases novel, initiatives. This will require rigorous risk assessment and

management by Network Rail. We will build into our inspection plans for CP4 actions that will enable us adequately to inspect those areas of change where consider the risks of safe delivery by Network Rail are highest. Through this inspection activity, we will be able to identify any weaknesses in Network Rail's actions and, if weaknesses are found, take action.

64. We have assessed the industry's plans to meet the HLOS safety metric in CP4, specified by the Secretary of State for GB as whole, of a 3% reduction in the risk of death or injury to passengers and rail workers. We consider that the specification can be achieved.
65. We have agreed that Network Rail can carry over £110m of unspent funding for its safety and environment plan from CP3 to fund further initiatives in these areas.

Efficient expenditure in CP4

66. Taking into account our assessment of Network Rail's SBP and SBP update, our judgements on efficiency, and our assessments of deliverability and safety management, table 6 summarises our conclusions on the level of expenditure that we consider Network Rail needs to undertake in CP4 in order to deliver its required outputs. We consider that Network Rail overstated its requirements in its plans, and can achieve its outputs through expenditure of £28.5bn, around £2.6bn (or 8%) less than it proposed in its plan.

Table 6: Summary of our CP4 efficient expenditure assumptions

| £m (2006-07 prices) | Network Rail SBP/SBP update | Our determination | Difference |
|--------------------------|-----------------------------------|----------------------|---------------|
| Controllable opex | 3,776 | 3,368 | (10.8%) |
| Non-controllable opex | 1,796 | 1,781 | (0.8%) |
| Maintenance | 4,887 | 5,016* | 2.6% |
| Renewals | 11,658 | 10,760 | (7.7%) |
| Enhancements | 9,026 | 7,612 | (15.7%) |
| Total | 31,143 | 28,537 | (8.4%) |

* Includes additional costs not included in Network Rail's SBP update, including harmonisation of maintenance employment terms and conditions, costs associated with the National Stations Improvement Programme (NSIP) and the HLOS performance fund.

Financial and risk framework

67. We said in our draft determinations that we would continue to monitor conditions in the financial markets before we confirmed our

determination of the financial framework for Network Rail in CP4.

68. Further to the work we have carried out and Network Rail's representations to our draft determinations, we confirm a number of changes to the financial framework for CP4, which:
 - will allow Network Rail to finance its activities;
 - provide incentives to the company to control costs and outperform our determination; and
 - provide protections to the company to deal with risk and uncertainty.

Unsupported debt

69. We support Network Rail's intention that the use of the financial indemnity (guarantee) the government provides for all Network Rail's borrowings will be restricted from the start of CP4. Network Rail will raise debt capital on an unsupported basis for the first time. This will be phased in incrementally over CP4 so that by the beginning of CP5 all new debt is raised on an unsupported basis. This will increase scrutiny from ratings agencies and actual and prospective lenders to Network Rail and hence improve the financial disciplines bearing on the company. Network Rail will need to maintain a solid investment grade credit rating in order to raise about £4.4bn of new debt in CP4. There will be no limit on the amount of new debt that can be raised on an unsupported basis.
70. Phasing in unsupported debt over the course of CP4 rather than instigating this new approach in full from the first year is a change from our draft determinations, following Network Rail's response and further consideration by us that it is a reasonable approach given current and anticipated conditions in the financial markets.
71. Those financial institutions lending to Network Rail without the benefit of a government guarantee will have their capital at risk. Government has been clear that, in the unlikely event that Network Rail did face severe financial difficulties, the assumption that lenders of unsupported debt should be making is that government will not rescue those lenders to protect its own position in relation to the supported debt.
72. Network Rail will be required to pay to DfT, as provider of the financial indemnity, a fee that reflects the value of the credit quality enhancement received as a result of the guarantee. We have set the level for the fee for the guaranteed debt at 0.8% per annum, which provides for payment to government of £1bn (in nominal terms) over CP4.

Allowed return

73. We will provide Network Rail with an allowed return that reflects our estimate of its risk adjusted cost of capital. Based on further work by CEPA updating its earlier study for us, taking into account the recent changes in credit market conditions, we consider the appropriate cost of capital (in real 'vanilla' terms) for Network Rail to be 4.75%.⁴ This is a change compared to our draft determinations where we assumed that the return should be 4.7% throughout CP4.
74. Part of the allowed return will be required to meet Network Rail's financing costs (including the financial indemnity fee). The remainder will be split between a risk buffer and a ring-fenced investment fund.

Managing risk and uncertainty

75. Inevitably, in determining outputs and access charges for the five years of CP4, there are uncertainties and risks that Network Rail's actual costs of delivering the required outputs (or revenues it will earn) will be different to those we have assumed in our determination.

76. We have taken account of these risks and uncertainties in establishing the overall package for CP4. We have ensured an appropriate allocation of risks that we expect Network Rail and its customers and funders to bear. Key elements of the package are:

- as part of the allowed return, the risk buffer, of £1bn over CP4, enables Network Rail to manage business risk and 'normal' fluctuations in cash flow. To the extent that Network Rail does not need it for these reasons it will have discretion over its use;
- the ring-fenced investment fund, of around £2.5bn over CP4, will be used to deliver capital expenditure that is required to deliver the HLOSs, except in cases of significant underperformance by Network Rail. Under defined circumstances, Network Rail will have full discretion to defer capital expenditure up to the value of £2.5bn (and hence outputs) to relieve financial pressures.
- our approach to rolling forward the RAB will be based on adding actual efficient capex to the RAB. This means that if Network Rail spends more than assumed in our determination, that this expenditure would be logged-up and added to the RAB at the start of CP5 if the additional expenditure is justified and incurred efficiently. Following Network Rail's representations, we have made some modifications to our approach to this, which reduce the threshold before

additions to the RAB are made for enhancements. The approach we set out for adding efficient overspend on enhancement schemes to the RAB will not be applied to schemes in Scotland, where we will undertake specific ex post efficiency assessments;

- we will index renewals input prices and material changes in input prices compared to our base assumptions will be logged up for addition to the RAB at the start of CP5. This policy will be symmetrical and we will also make deductions from the RAB for changes in input prices less than our assumptions.
 - we have made specific allowances in the funding of the enhancement programme to provide for particular risks over and above those covered by the general risk buffer, and the Thameslink project (the largest enhancement scheme, with estimated expenditure of £2.8bn in CP4) is subject to a specific protocol between Network Rail and government, which we have approved, that insulates Network Rail from major cost shocks; and
 - Network Rail's access charges and the network grant payments will be rebased by the retail price index (RPI) each year. This protects the company against general inflation risk.
77. Ultimately if the various protection measures are exhausted and the re-opener provisions are met, which includes breaching a key financial trigger (a value of around 1.4x on average over a three year forward-looking period for the adjusted interest cover ratio (AICR)), then there is the option for us to undertake an interim review of Network Rail's outputs and access charges. This means that Network Rail's customers and funders bear the risks of changes to access charges and/or outputs as a result of this.

Amortisation

78. We have set the amortisation allowance based on long-run steady-state renewals expenditure (with a further small addition to amortise the non-capex additions we are making to the RAB at the start of CP4). Our overall amortisation allowance for CP4 is £7.3bn, £1.4bn less than that which Network Rail assumed in its SBP update, where Network Rail adopted the upper bound of the possible range for amortisation that we previously published.

Revenue requirement

79. Based on our assessment of efficient expenditure, and the parameters we have established for the financial framework, table 7 shows our determination of the revenue requirement that Network Rail needs in CP4. We

⁴ A 'vanilla' return combines a pre-tax cost of debt and a post-tax cost of equity.

consider that the amount of revenue that Network Rail requires in CP4 is £26.7bn. This is £2.4bn (8%) less than the £29.1bn forecast by the company in its SBP update.

Table 7: Our determination of Network Rail's CP4 revenue requirement (Great Britain)

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total | SBP update |
|----------------------------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|
| Maintenance | 1,091 | 1,047 | 1,000 | 960 | 918 | 5,016 | 4,989* |
| Controllable opex | 723 | 702 | 674 | 647 | 621 | 3,368 | 3,776 |
| Non-controllable opex | 329 | 350 | 361 | 369 | 373 | 1,781 | 1,796 |
| Schedule 4 and 8 | 170 | 151 | 153 | 123 | 116 | 712 | 927 |
| Allowed return | 1,530 | 1,641 | 1,734 | 1,801 | 1,853 | 8,561 | 8,856 |
| Amortisation | 1,458 | 1,458 | 1,458 | 1,458 | 1,458 | 7,290 | 8,690 |
| Tax | - | - | - | - | - | - | 85 |
| Gross revenue requirement | 5,301 | 5,349 | 5,381 | 5,357 | 5,340 | 26,728 | 29,119 |

* The maintenance assumption in Network Rail's calculation of the revenue requirement in its SBP update is £100m higher than its maintenance expenditure assumption due to the inclusion of £100m of performance fund expenditure as maintenance in the revenue requirement.

Contractual and financial incentives

80. An important part of PR08 has been the review of the incentives that Network Rail and the industry face to work together and improve whole industry outcomes.
81. In our draft determinations, following proposals made to us by Network Rail and the industry, we proposed to implement an efficiency benefit-sharing mechanism between Network Rail and train operators. If Network Rail can deliver its outputs and obligations for less than we have determined then it will distribute 25% of this 'outperformance' to passenger and freight train operators, initially at the national level (separately for England & Wales and Scotland). The payments will be divided between operators on the basis of their relative share of variable usage charge payments and will be made following our annual assessment of Network Rail's performance. We will review the mechanism after two years.
82. To allow franchised operators to benefit from this mechanism will require government to waive the terms of franchise agreements so that any payments are not captured by the 'no net loss, no net gain' provisions. Non-franchised passenger and freight operators can benefit immediately. Neither DfT nor Transport Scotland currently support the proposed mechanism, as they set out in their responses to our draft determinations. We will implement the mechanism as set out in the draft determinations

and we will encourage all operators to work energetically with Network Rail in pursuit of outperformance, so that they produce clear evidence of the contribution they are making. We remain strongly of the view that this engagement is beneficial for the industry and will reduce the future burden on customers and funders. We urge government to give this serious consideration in order to strengthen the incentive and increase the benefit to customers and funders over the longer-term.

83. We are retaining a volume incentive in CP4, to incentivise Network Rail to respond to demand growth greater than that assumed in the SBP (based on the HLOSs).
84. We have also implemented a rolling capex incentive mechanism, to equalise the incentive that Network Rail has to make efficiency savings, across each year of the control period.
85. Following cross-industry working, we are making improvements to the schedule 4 and 8 possessions and performance regimes, including updated values to provide correct price signals to Network Rail and train operators.

HLOS affordability

86. We have examined the whole industry costs to the two governments of delivering the HLOSs, which include franchise support as well as the revenue required by Network Rail (less income from third parties, such as open access passenger and freight operators and property rental). We have carried out these assessments so that we could establish whether the SoFAs of

each government are adequate to secure the achievement of the HLOSs.

£860m over CP4. The Scottish HLOS shows a surplus of £64m over CP4.

87. Tables 8 and 9 summarise our assessment of the affordability calculations.
88. Both HLOSs are affordable for the control period as a whole (i.e. the SoFAs are adequate). The England & Wales HLOS shows a surplus of

Table 8: Results of the HLOS affordability calculation for CP4 – England & Wales

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total |
|---|--------------|--------------|--------------|--------------|--------------|---------------|
| SoFA | 2,888 | 2,700 | 2,706 | 2,567 | 2,444 | 13,305 |
| Less franchise support* | (1,496) | (1,259) | (988) | (755) | (473) | (4,971) |
| Plus assumed (in the SoFA) franchise payments to Network Rail | 2,863 | 2,879 | 2,887 | 2,890 | 2,895 | 14,414 |
| Funds available for Network Rail | 4,256 | 4,320 | 4,605 | 4,703 | 4,866 | 22,749 |
| Less Network Rail revenue requirement | 4,343 | 4,400 | 4,402 | 4,382 | 4,364 | 21,890 |
| Surplus/(deficit) | (87) | (80) | 203 | 321 | 502 | 859 |

* Includes our estimate of additional depots costs (which are assumed to be capitalised) and rolling stock.

Table 9: Results of the affordability calculation for CP4 – Scotland

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total |
|---|------------|------------|-------------|-------------|-------------|--------------|
| SoFA | 759 | 826 | 676 | 668 | 673 | 3,600 |
| Less franchise support | (321) | (331) | (359) | (360) | (367) | (1,738) |
| Plus assumed (in the SoFA) franchise payments to Network Rail | 150 | 150 | 150 | 150 | 150 | 750 |
| Funds available for Network Rail | 588 | 645 | 467 | 458 | 456 | 2,612 |
| Less Network Rail revenue requirement | 505 | 513 | 514 | 511 | 506 | 2,549 |
| Surplus/(deficit) | 83 | 132 | (47) | (53) | (50) | 64 |

Access charges and network grant

89. Network Rail recovers its revenue requirement through track access charges paid by franchised passenger and open access passenger and freight operating companies, station access charges paid by station users, network grant paid by government (in lieu of track access charges) and other sources of income.
90. We will allow continuation of network grants in CP4 as part of the funding mix with access charges, with the level of grants being fixed for the duration of CP4 and established by reference to government accounting rules, with a degree of headroom factored in to accommodate cost or revenue fluctuations.
91. We are largely retaining the existing structure of charges but changing the levels. We are not

implementing any route or geographical based charges in CP4. We have reviewed Network Rail's proposals for the various individual access charges. In particular, the level of all the variable usage charges paid by passenger train operators will reduce overall by around 35% (excluding the impact of growth) due to improved calculation of variable usage costs and the effect of our efficiency assumption. As we have set out previously in PR08, we are establishing a new charge for certain traffic on freight only lines.

92. Excluding the impact of growth, but including the effect of the new charge for coal for the electricity generation and spent nuclear fuel traffic, overall charges in CP4 for freight operators will fall by around 35% compared to current levels.

93. The remainder of Network Rail's revenue requirement (besides access charges and grant) is recovered from other income. This is dominated by income from property rentals and sales. Following Network Rail's representations and in light of the current economic conditions we have reduced our assumptions of property rental income. We have also reduced our assumption for property sales income in the first two years of CP4 but re-phased the income to the final three years. We are retaining our assumption that the redevelopments of Euston and Victoria stations will proceed towards the end of CP4. However, in the light of economic conditions, if the developments cannot proceed in CP4, then we will compensate Network Rail in CP5 for the loss of income that it will have incurred compared to our assumptions now.
94. Table 10 shows the sources of income in CP4 (at Great Britain level) to recover the gross revenue requirement.

Monitoring and enforcement

95. The continuing development and maturing both of the privatised rail industry and of Network Rail as an organisation would itself call for us to review our approach to monitoring as we approach a new control period. This need is made greater by the significant change in the nature of the obligations Network Rail is being asked to take on. Alongside further

improvements which will take safety and performance to their highest levels on record there will be a major programme of enhancement works to increase network capacity and capability.

96. Our monitoring will focus primarily on the following issues:
- whether the industry is on course to deliver the HLOS safety requirement;
 - whether Network Rail is delivering the other top level regulated outputs;
 - whether Network Rail is on course to deliver the programme of works to support delivery of the HLOS capacity specifications, and the other enhancements being funded under this determination;
 - whether Network Rail is managing its assets in line with the policies and activity programmes on which this determination is based;
 - whether Network Rail is achieving the expected efficiencies in operating, maintenance, renewal and enhancement; and
 - whether Network Rail is operating within the financial boundaries set by our determination.

Table 10: Sources of Network Rail's income in CP4 (Great Britain)

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total |
|--|--------------|--------------|--------------|--------------|--------------|---------------|
| Franchised passenger train operators – total variable charges | 437 | 443 | 454 | 463 | 468 | 2,265 |
| Franchised passenger train operators – fixed charges | 744 | 782 | 760 | 900 | 1,160 | 4,346 |
| Income from freight operators | 68 | 70 | 71 | 73 | 75 | 357 |
| Income from open access operators | 18 | 18 | 18 | 18 | 18 | 88 |
| Station long term charge income | 137 | 137 | 137 | 137 | 137 | 686 |
| Schedule 4 and 8 income | 170 | 151 | 153 | 123 | 116 | 712 |
| Other income (inc property rental, property sales and depots income) | 323 | 323 | 348 | 376 | 386 | 1,754 |
| Network grant | 3,405 | 3,426 | 3,440 | 3,269 | 2,980 | 16,520 |
| Total income | 5,301 | 5,349 | 5,381 | 5,357 | 5,340 | 26,728 |

Rounded to the nearest million. This excludes the additional £8m of network grant payments from Transport Scotland to Network Rail to reflect the financing costs of grant reprofiling.

97. We will carry out a certain amount of monitoring of delivery of other local (disaggregated) customer reasonable requirements (CRRs) but this will not extend to every CRR defined by the CP4 delivery plan. We will expect operators and other stakeholders to draw matters to our notice if they wish them to receive regulatory attention.
98. If Network Rail is failing, or is likely to fail, to meet one or more of its obligations derived from this determination we will consider whether we should to take enforcement action.
99. We will continue to publish full assessments of Network Rail's performance annually, and shorter focused assessments quarterly. We will review the form and content of our publications from time to time to ensure that they are achieving our objective of communicating these matters effectively.

Implementation

100. The review notices which initiate the legal implementation of our determination and the final audited levels of the detailed individual access charges and associated price lists will be published on 18 December 2008. The detailed charges/price lists will be consistent with this determination.
101. Following publication of the review notices, Network Rail will have until 5 February 2009 to decide whether it accepts or rejects the conclusions of the periodic review. If it rejects our determination then we expect to refer our determination to the Competition Commission. The Competition Commission would review all the evidence available and reach its own view on Network Rail's access charges, outputs and the regulatory framework. Whilst any reference to the Competition Commission is in progress, our determination will apply.

Overview of key changes to our draft determinations

Table 11: Key changes to our draft determinations

| |
|--|
| Changes to the output measures |
| <ul style="list-style-type: none"> Confirmation of the required reduction in the disruption to passengers from engineering work |
| Activity and expenditure (pre-efficiency) |
| <ul style="list-style-type: none"> Provision for certain additional renewals activity and expenditure, including IT and corporate accommodation Provision for some additional enhancement work (including Gatwick airport) and new funding for the East Midlands resignalling project A small amount of re-phasing of enhancement spend out of 2009-10 Provision for a certain amount of renewals and enhancement expenditure deferred from CP3, including safety and environment schemes Revised CP4 starting position for opex and maintenance (reflecting pensions costs and the costs of harmonising the terms and conditions of maintenance staff) |
| Changes to our efficiency assumptions |
| <ul style="list-style-type: none"> Re-phased efficiencies (lower in the first two years and higher in the final three years, with the same overall exit rate) Separated maintenance and renewals efficiency assumptions Certain renewals expenditure treated as post-efficient Indexation of renewals input prices |
| Changes to our income assumptions |
| <ul style="list-style-type: none"> Accepted Network Rail's lower rental income projections Inclusion of an adjustment mechanism for property income associated with the proposed Euston and Victoria developments in case they do not proceed in CP4 |
| Changes to the financial and regulatory framework |
| <ul style="list-style-type: none"> Phasing in unsupported debt over the course of CP4 An increase in the rate of return (taking into account a higher cost of debt to reflect market conditions) Change to the basis for the calculation of the ring-fenced fund (which increases it, to reinforce the hard-budget constraint on Network Rail) |

| |
|--|
| <ul style="list-style-type: none">• Reduced threshold for logging up additional enhancement expenditure to the RAB, and revised treatment of Scottish enhancement schemes• Update of the opening CP4 RAB and debt values based on the projected CP3 outturn and deferral of expenditure from CP3• Reduced possessions compensation costs based on lower levels of disruption |
| Total impacts on our determination for CP4 of all the changes to our draft determinations (GB-wide) |
| <ul style="list-style-type: none">• Increase in opex, maintenance, renewals and enhancement expenditure of £770m (£27.8bn to £28.5bn)• Increase in gross revenue requirement by £190m (£26.5bn to £26.7bn) |

Acronyms and abbreviations

| | |
|--------|---|
| ACS | Access charge supplement |
| ACR03 | Access charges review 2003 |
| ASI | Asset stewardship index |
| ATOC | Association of Train Operating Companies |
| BERR | Department for Business, Enterprise and Regulatory Reform |
| Capex | Capital expenditure |
| CECASE | Civil engineering cost and strategy evaluation |
| CLG | Company limited by guarantee |
| COPI | Construction output price index |
| CP3 | Control period 3 (1 April 2004 – 31 March 2009) |
| CP4 | Control period 4 (1 April 2009 – 31 March 2014) |
| CP5 | Control period 5 (1 April 2014 – 31 March 2019) |
| CRR | Customer reasonable requirements |
| CTRL | Channel Tunnel Rail Link |
| CUI | Capacity utilisation index |
| DfT | Department for Transport |
| ERTMS | European railway traffic management system |
| ESI | Electricity supply industry |
| ESTA | Electricity supply traction area |
| FCR01 | Review of freight charging policy of 2001 |
| FIM | Financial indemnity mechanism |
| FOC | Freight operating company |
| FTN | Network Rail's fixed telecom network |
| GRIP | Guide to railway investment projects |
| GSM-R | Global system for mobile communications – railways |
| HLOS | High level output specification |
| ICM | Infrastructure cost model |
| IEP | Intercity express programme |
| IOPI | Infrastructure output price index |
| ISBP | Initial strategic business plan |
| JPIP | Joint performance improvement plan |
| Kgtkm | Thousand gross tonne kilometres |
| KPI | Key performance indicator |
| KRA | Key risk area |
| LICB | Lasting infrastructure cost benchmarking |
| LSE | London and south-east |
| MIP | Management incentive plan |

| | |
|--------|---|
| MLUI | Moderately large users index |
| NMF | Network modelling framework |
| NRDF | Network Rail discretionary fund |
| NRN | National radio network |
| NSIP | National stations improvement programme |
| OM&R | Operating, maintenance and renewals |
| Opex | Operating expenditure |
| ORR | Office of Rail Regulation |
| PAYG | Pay-as-you-go |
| PDI-F | Passenger disruption index – freight |
| PDI-P | Passenger disruption index – passenger |
| PPM | Public performance measure |
| PPP | Purchasing power parity |
| PR08 | Periodic review 2008 |
| PR2000 | Periodic review 2000 |
| PTE | Passenger Transport Executive |
| RAB | Regulatory asset base |
| RFF | Ring-fenced investment fund |
| RIA | Railway Industry Association |
| RPI | Retail price index |
| RSSB | Rail Safety and Standards Board |
| RUOE | Real unit operating expenditure |
| RUS | Route utilisation strategy |
| S&C | Switch and crossing |
| SBP | Strategic business plan |
| SEU | Signalling equivalent unit |
| SFN | Strategic freight network |
| SFO | Station facility owner |
| SISS | Station information and surveillance systems |
| SOCC | Structure of costs and charges |
| SoFA | Statement of public financial resources available |
| SPADS | Signals passed at danger |
| SRM | Safety risk model |
| TIF | Transport innovation fund |
| TOC | Train operating company |
| TPWS | Train protection and warning system |
| TSR | Temporary speed restriction |
| UIC | International union of railways (Union Internationale des Chemins de Fer) |

1. Introduction

Purpose of this document

- 1.1 The 2008 periodic review (PR08) is the process whereby we determine the outputs that Network Rail Infrastructure Limited (Network Rail) must deliver, and the levels of access charges payable by train operators, during the five years of control period 4 (CP4), which will run from 1 April 2009 to 31 March 2014.
- 1.2 In this document we set out our determination of the outputs and access charges. We also explain the judgements we have made on the revenue requirement that underpins the calculations of the access charges and set out the values of the incentive rewards that Network Rail and its industry partners can achieve if Network Rail outperforms our determination.
- 1.3 We also provide our assessments on the affordability of the high level output specifications for the railway in CP4 for England & Wales and Scotland established by, respectively, the Secretary of State for Transport and Scottish Ministers.
- 1.4 The access charges we are determining in PR08 are the track access charges payable by franchised passenger and open access passenger and freight train operating companies, and the station long term charge payable by users of stations. We are also establishing the level of network grant that the governments in England & Wales and Scotland will be allowed to pay to Network Rail in lieu of access charges.
- 1.5 Our determination represents a balanced package that should be considered and judged as a whole. Alongside the outputs and access charges, the other key parts of the package are the obligations of Network Rail's licence, the new financial framework and the various protections we have established for Network Rail to deal with risks and uncertainties, the contractual and financial incentives, the structure of charges, and the monitoring and enforcement framework.
- 1.6 We published our draft determinations in June 2008 and we have received 115 responses to that.⁵ A list of the respondees is provided in annex A. Further to the draft determinations, we also published a consultation on the proposed trajectories for the passenger and freight network availability measures (possession disruption indices), a paper that set out how the re-opener provisions could be triggered and the draft content of our review notice.
- 1.7 We are grateful for all the responses we have received and we have considered them all carefully in making our determination. This document will

⁵ The responses to our draft determinations have been published on the ORR website and may be accessed at www.rail-reg.gov.uk/server/show/ConWebDoc.9196

refer to, summarise and discuss responses. However, it is not the purpose of this document to set out our views on all the points of detail raised in the responses to the draft determinations. We will also be publishing during November 2008 a document containing our responses to the detailed issues raised.

- 1.8 As well as considering the responses to our draft determinations in order to make our determination we have also taken account of Network Rail's actual 2007-08 audited regulatory accounts and the most up-to-date forecast of its likely 2008-09 financial performance. These allow us to refine the values for the CP4 opening RAB and debt we use in our calculations of the revenue requirement. We also said in our draft determinations that we would monitor conditions in the financial markets before making our final determination on the financial framework, in particular the allowed rate of return for Network Rail. We have also updated our retail price inflation (RPI) forecast.
- 1.9 We will publish the review notices and final levels of individual access charges and associated price lists on 18 December 2008. The review notices will set out the changes which we propose to make to give effect to this determination.

Structure of this document

- 1.10 The rest of this document is structured into seven parts:
- Part A provides background to the review and outlines our overall approach to setting outputs and access charges.
 - Part B sets out our determination for Network Rail's regulated outputs and explains the judgements we have made on the efficient level of expenditure that we consider that Network Rail needs to undertake to deliver these outputs. This part also contains our assessments of Network Rail's ability to deliver its capital programme in CP4 and the management of safety.
 - Part C sets out our determination for the financial framework and Network Rail's overall revenue requirement.
 - Part D sets out our determination for track access charges and the station long term charge, the levels for network grant, and sets out our assessment of other single till income.
 - Part E sets out our determination on the contractual incentives between train operators and Network Rail (performance and possessions regimes), and the volume and efficiency benefit sharing financial incentives.
 - Part F sets out our assessment of the affordability of the two HLOSs.
 - Part G explains the implementation of PR08 and summarises our proposed approach to monitoring and enforcement in CP4.

Price base

1.11 All values in this document are in 2006-07 prices unless otherwise stated. All historic data is rebased to November 2006-07 prices using the all items retail prices index (RPI).

PR08 timetable

1.12 Table 1.1 contains the the remaining high-level milestones in PR08.

Table 1.1: High-level timetable for the remainder of PR08

| Date | Milestone |
|----------------------|--|
| 18 December 2008 | Final access charges (price lists/charge schedules) are audited and approved by us. Review notices are served starting the formal implementation of PR08 |
| 5 February 2009 | Final point at which objections could be made to our review notices |
| By end of March 2009 | Network Rail publishes its CP4 delivery plan |

Corporate strategy

1.13 Our current corporate strategy runs until March 2009. In parallel with the completion of PR08, we are developing our corporate strategy for the five years of CP4, which we consulted on in July 2008. We intend to publish our strategy for CP4 in December 2008. It will set out the industry outcomes by which we will judge our success in CP4, how we consider we can best contribute to their delivery, and our key regulatory priorities, reflecting the conclusions of the review.

2013 periodic review

1.14 We are currently assuming the next periodic review of Network Rail's outputs and access charges will cover the five years from April 2014 to March 2019. Our initial thinking concerning the key milestones for the review is that:

- the industry, through Network Rail, needs to set out the key medium and long term options for the railway in June 2010;
- the industry, through Network Rail, produces its initial industry plan setting out what is needed, with robust costs for how it is to be delivered safely and efficiently, in June 2011;
- we will commence the formal stage of the periodic review and provide our advice to government on outputs and access charges for 2014-19 in February 2012;

- governments in England & Wales and in Scotland produce specifications of what they want the railways to deliver and how much money they have available in July 2012;
- the industry through Network Rail produces its strategic business plan in October 2012; and
- we will produce our draft determination in June 2013 and determination in October 2013.

PART A: BACKGROUND AND APPROACH

2. Background and approach

Introduction

2.1 This chapter provides background to PR08, including the objectives and the legal basis, and outlines the broad approach we have adopted to determine Network Rail's outputs and access charges.

Objectives of PR08

2.2 Our overarching objective for the review is to ensure an outcome that secures value for money for users and taxpayers, by determining the level of Network Rail access charges and outputs in a way that balances the interests of all parties. Annex B contains further specific objectives for PR08. In terms of outcomes from the railway in CP4, if these objectives are achieved, Britain will have a railway that is safer than ever before, is more reliable than ever before, whilst carrying significantly more passengers and freight, at a cost that represents ever better value for money for users and taxpayers.

2.3 In developing our determination for CP4 we have been mindful of all our public interest duties, set out in section 4 of the Railways Act 1993. These duties are not in any order of priority and it is for us to decide how to balance them in reaching a decision. However, a critical duty in respect of setting access charges is to "act in a manner which [we] consider will not render it unduly difficult for [Network Rail] to finance any of [its] activities or proposed activities [...]." Other section 4 duties we have been particularly mindful of are:

- to promote improvements in railway service performance;
- to promote efficiency and economy on the part of persons providing railway services;
- to take into account the need to protect all persons from dangers arising from the operation of railways;
- to enable persons providing railway services to plan the future of their businesses with a reasonable degree of assurance;
- to have regard to any general guidance given by the Secretary of State, or Scottish Ministers in relation to Scottish railway services, about railway services or other matters relating to railways;
- in having regard to any such guidance from Scottish Ministers to give what appears to us to be appropriate weight to the extent (if any) to which the guidance relates to matters in respect of which expenditure is to be [...] incurred by Scottish Ministers; and
- to have regard to the funds available to the Secretary of State for the purposes of his functions in relation to railways or railways services.

New procedure for an access charges review

- 2.4 PR08 is the first review to take place after the procedure for conducting an access charges review, set out in Schedule 4A to the Railways Act 1993, was amended following the Railways Act 2005. The central element of the new process is that the Secretary of State for Transport and Scottish Ministers each have had to provide us with information about what they want to be achieved by railway activities during the control period and the public financial resources that are, or are likely to be, available for the achievement of those activities. They did this by producing 'high-level output specifications' (HLOSs), setting out what they want to be achieved, and 'statements on the public financial resources available' (SoFAs).⁶
- 2.5 We have taken account of the HLOSs and SoFAs in making our determination. We have also taken account of the reasonable requirements of all of Network Rail's customers and other funders, including open access passenger and freight train operators, to the extent these are not covered by the government specifications.

The industry context and Network Rail's progress

- 2.6 When Network Rail took over ownership of the rail infrastructure in 2002 from Railtrack (in administration), it faced a network where costs had spiralled and delays were far above the levels of a few years before. Since then the company has achieved a great deal in rectifying the problems it inherited. It has made good progress in improving performance, understanding better its assets and getting costs under control.

Train performance

- 2.7 At ACR03 we set Network Rail a target of reducing its delay minutes (affecting all operators) by 26%, from 12.3 million minutes in 2004-05 to 9.1 million minutes in 2008-09. Network Rail is currently beating the target and expects to account for 8.9 million minutes of delay in 2008-09.
- 2.8 Passenger train performance as measured by PPM is now over 90% on a moving annual average basis.

Asset management

- 2.9 Following the Hatfield derailment in October 2000, there has been a significant increase in activity levels. For instance, under Railtrack renewal rates for each of rail, sleepers and ballast were around 400km each year between 1996-97 and 1999-00. Since then renewal rates have increased significantly with rail renewal, for example, increasing to a peak of 1125km in

⁶ The HLOS published by the DfT may be accessed at www.dft.gov.uk/about/strategy/whitepapers/whitepapercm7176/.
The HLOS published by Transport Scotland may be accessed at www.transportscotland.gov.uk/files/documents/rail/HLOS-July-2007.pdf.

2003-04. Network Rail forecasts rail renewal to be stable and average around 920km per annum over CP4.

2.10 Figure 2.1 shows the development of key asset performance indicators over CP3. The asset stewardship index, a broad measure of asset condition, has shown steady improvement over the control period, while the number of infrastructure related incidents causing delays has fallen by around 10%. There have been significant reductions in the number of broken rails and in temporary speed restrictions (TSRs) caused by the condition of structures and earthworks. The overall picture has been one of better asset performance.



Figure 2.1: Asset performance indicators

Safety performance

2.11 Since March 2002 RSSB's precursor indicator model (PIM), which reflects changes in train accident risk, has shown an improvement of over 50%. Around 20% of this improvement has been achieved because of the implementation of TPWS (train protection and warning system) and the subsequent reduction in signals passed at danger (SPADS). However, over the last 12 months the PIM has shown a slight deterioration with most of the individual risk groups showing either a flattening or an upturn.

2.12 In addition to train accidents, the safety risk model (SRM), which is managed by RSSB on behalf of the industry, identifies other main key risk areas (KRAs): public behaviour – crime, public behaviour – level crossings, passengers – at stations, passengers – on trains, workforce – train crew, and

workforce – track workers. Of these KRAs, the safety risk to passengers at stations is now about 10% better than the beginning of 2002; for passengers on trains the safety risk is about 20% better. Since 2002 risk to both track workers and station staff has improved by about 20%. Train crew risk is currently at about the same level as in 2002.

- 2.13 For the 2007-09 strategic safety plan a new approach was adopted to developing safety targets.⁷ The term 'safety target' was replaced with the term 'trajectory'. The reason for the change is that trajectories not only establish the industry's ambitions in the KRAs, but also explain the actions that are being undertaken to achieve them. The strategic safety plan 2008 – 2010 further developed the trajectories making the majority of them quantitative in nature.⁸ Analysis, including long term trends and industry initiatives taken to support the trajectories in the KRAs, can be found in chapter 3 of RSSB's annual safety performance report 2007⁹ which gives the most up to date figures available.

Expenditure

- 2.14 Figure 2.2 shows Network Rail's (and Railtrack's) actual (to 2006-07) and forecast (from 2007-08) operating, maintenance and renewals (OM&R) expenditure, since privatisation. The total (including West Coast route modernisation renewals) increased from under £3bn in 1995-96 to a peak in excess of £6bn in 2003-04 due to the significant increases in activity levels and unit costs. OM&R expenditure is projected to fall to some £5bn by the end of 2008-09, although the profile for CP3 (from 2004-05 to 2008-09) is flatter than we assumed at ACR03 due to reprofiling by Network Rail of its expenditure.

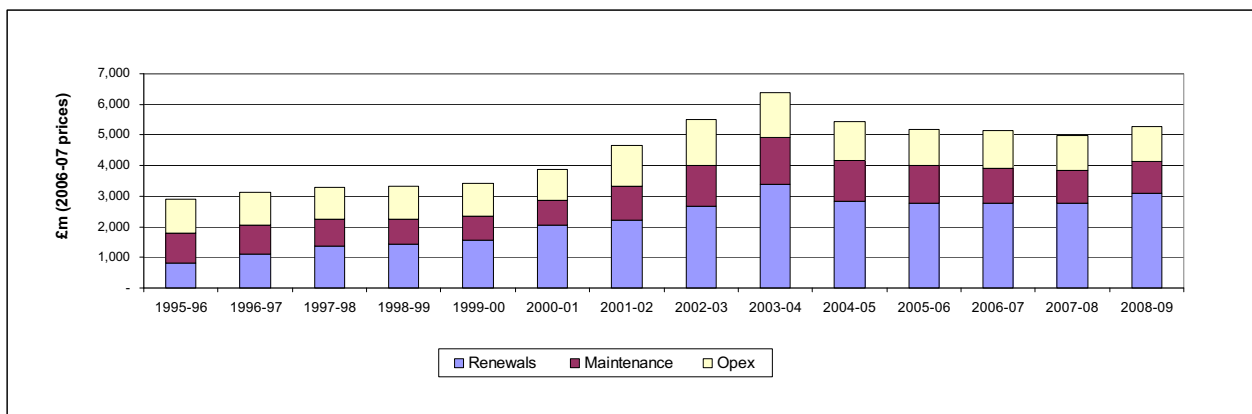


Figure 2.2: Operating, maintenance and renewals expenditure since 1995-96

⁷ The Railway Strategic Safety Plan 2007 – 2009 may be accessed at www.rssb.co.uk/pdf/reports/strategic_safety_plan_07-09.pdf.

⁸ The Railway Strategic Safety Plan 2008 – 2010 may be accessed at www.rssb.co.uk/pdf/reports/strategic_safety_plan.pdf.

⁹ The Annual Safety Performance Report 2007 may be accessed at www.rssb.co.uk/pdf/reports/ASPR_2007.pdf.

How we determine access charges

- 2.15 At a periodic review we assess the efficient level of revenue that Network Rail needs to run its business (including an allowed return on its regulatory asset base) to deliver the required outputs. The access charges we determine are set to recover this revenue requirement, taking into account other sources of income. The company's revenue requirement is funded through:
- track access charges paid by franchised passenger train operators (TOCs), open access passenger train operators, and freight train operators (FOCs);
 - station long term charges paid by users of stations;
 - grants paid to the company by DfT and Transport Scotland in lieu of access charges; and
 - other sources of income, such as property rental.
- 2.16 The calculation of the revenue requirement follows the standard 'building block' approach described further below.
- 2.17 We make our determination based on an assessment of the overall level of efficient expenditure we consider the company needs to undertake over the control period to deliver its outputs. Whilst we derive this from review and challenge of Network Rail's own plans, as well as undertaking our own independent assessments, we do not decide the detailed level, or pattern, of expenditure or activity that Network Rail may ultimately need to undertake in order to deliver the required outputs. It is for the company to define and deliver its volumes of work consistent with its asset policies, actual asset condition, requirements of the network, and its licence, legal and contractual obligations.

Overall package

- 2.18 Our judgements on the efficient level of expenditure that Network Rail needs to undertake in CP4 and the access charges and network grant levels necessary to recover these costs are part of a balanced package. The package refers to the entire set of judgements for our determination. We expect the package to be considered and judged as a whole. The components of the package comprise:
- the outputs that Network Rail needs to deliver (including the related change mechanism);
 - the level of efficient expenditure we consider Network Rail should incur in achieving the outputs;
 - the assumptions on the income Network Rail will earn as part of the single till calculations;
 - the financial framework and the treatment of risk and uncertainty;

- the structure of charges (and the balance between access charges and network grants) and the performance and possessions regimes;
- the financial incentive mechanisms to promote achievement or outperformance of our assumptions; and
- the monitoring and enforcement of Network Rail's outputs and financial performance, and the changes to Network Rail's licence.

Building block approach

2.19 We have used the standard building block methodology as the basis for determining Network Rail's revenue requirement and access charges. This is the same approach that we used in ACR03 to determine the access charges for the current control period. It is also generally the approach adopted by other UK economic regulators. The methodology is illustrated in figure 2.3. The key features of the building block methodology are that:

- projected operating and maintenance expenditure is determined for each year of the control period and recovered on a 'pay-as-you-go' (PAYG) basis (i.e. the revenue requirement with respect to operating and maintenance expenditure equals projected expenditure);
- capital expenditure (capex), on renewals and enhancements, is added to the RAB in the year in which it is incurred.¹⁰ Where capex is added to the RAB, the actual expenditure in the control period on renewals and enhancements is financed through the amortisation allowance or, where renewals and enhancements exceed the amortisation allowance, through borrowing for the excess. Network Rail will receive the revenue to repay its debt principal and interest charges through the amortisation allowance and the allowed return on the RAB;
- the return on the RAB covers the interest payments that the company needs to make to its creditors, the FIM fee payment to government and an expanded profit element which is split between a 'risk buffer' to deal with cost and revenue shocks during the control period and a ring-fenced investment fund (described further in chapter 15) which in normal circumstances will be reinvested;
- the gross revenue requirement is funded through track and station access charges, network grant (in lieu of access charges) and other income (e.g. property income). The various variable track access charges, station long term charge and other single till income are netted off the gross revenue requirement to leave the net revenue requirement, which is funded by a mix of fixed track access charges and network grant.

¹⁰ The exception to this is capex funded through the ring-fenced investment fund, which is not added to the RAB but paid for on a PAYG basis.

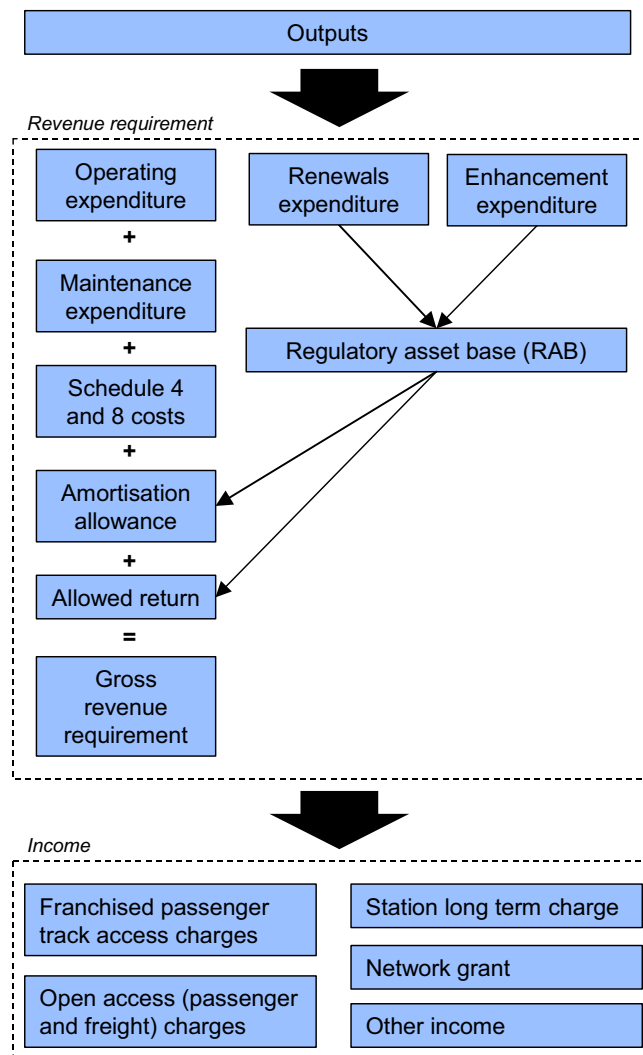


Figure 2.3: Building block approach

Progress with PR08

- 2.20 We started PR08 in August 2005 when we published our initial consultation document on the process and key issues. Since then we have carried out a significant amount of work. Through PR08 we are making improvements to the framework we use for setting outputs and access charges, following extensive consultation on the structure of outputs, the incentive and financial frameworks and the structure of charges. We set out most of the principles we have used for setting outputs and access charges for CP4 in our advice to ministers and framework for setting access charges in February 2007, with further principles set out in our update on the framework for setting outputs and access charges and SBP assessment in February 2008.
- 2.21 In June 2008 we published our draft determinations for consultation. It set out some outstanding items of the framework. There were also a number of further consultations that we published following the draft determinations, on the new network availability measure (possession disruption indices), on the interim re-opener provisions, and on the draft content of our review notice

which begins the process of implementing this determination. We received 115 responses to our draft determinations, and further responses to the network availability consultation. We have considered carefully all of these responses in making our determination. Further to its response to our draft determinations we have had various meetings with Network Rail and the company has also written to us and provided us with further detailed information in support of its response, which we have also taken into account in making our determination.

- 2.22 All our documentation relating to PR08 is available on our PR08 webpage.¹¹
- 2.23 Extensive work on the assessment of Network Rail's expenditure and revenue requirement for CP4 has run throughout PR08. In December 2005 we published our initial assessment of the potential CP4 revenue requirement. Network Rail published its initial strategic business plan in June 2006, which we used as the basis for the advice we provided to the governments in England & Wales and Scotland. We published a version of this as part of our advice to ministers and framework for setting access charges in February 2007. It was at this time that we served the review initiation notice, and formally asked the two governments to provide us with their HLOSs and SoFAs, which they did in July 2007. Our advice to ministers document also included a summary of our guidance to Network Rail on the form and content of its SBP, which it published in October 2007. We set out our initial response to the SBP in our update on the framework for setting outputs and access charges and SBP assessment in February 2008. We also asked Network Rail to provide an update of parts of the SBP where we did not find the company's justification convincing or where work was still to be completed. Network Rail published its SBP update in April 2008. The SBP was the company's principal submission to us on its expenditure plans, augmented in certain important areas by the SBP update.¹²

Form of the price control

- 2.24 We are retaining the current hybrid revenue/price cap form of incentive based regulation for CP4. Under this model the larger share of Network Rail's revenue requirement, recovered through the fixed charges (or grants in lieu of charges), is based on a revenue cap, i.e. the revenue that Network Rail can earn is fixed for the duration of the control period (except if there are increments or decrements to outputs and subject to the approach to the treatment of inflation, discussed further below). The remaining share of the revenue requirement, recovered through variable charges, is subject to a price cap which establishes caps on individual charges (e.g. the individual charges for passenger and freight vehicles in the price lists) but does not

¹¹ Our PR08 webpage may be accessed at www.rail-reg.gov.uk/server/show/category.180.

¹² *Strategic Business Plan: Control Period 4*, Network Rail, October 2007. This may be accessed at www.networkrail.co.uk/asp/4355.aspx.

Strategic Business Plan Update: Control Period 4, Network Rail, April 2008. This may be accessed at <http://www.networkrail.co.uk/asp/5160.aspx>.

impose a limit on the level of revenue that Network Rail can earn: it will fluctuate with actual demand. The level of other single till income, e.g. from property income, may also differ to the levels we assume when we determine the overall revenue requirement. We consider that our approach achieves the appropriate balance between providing certainty of funding to the company and appropriate incentives on industry parties. This approach has been supported by stakeholders in consultation during PR08.

Duration of the price control

- 2.25 We are retaining the current five-year control period for CP4, used by other UK economic regulators, on the basis that it is a long enough period to provide appropriate incentives on Network Rail and certainty for customers and funders but also short enough to reflect the difficulties in forecasting costs and revenues over long time horizons. Again, this approach received strong support from stakeholders in consultation during PR08.

Dual till versus single till

- 2.26 In common with other economic regulators we use a 'single till' approach to setting a price control on Network Rail's regulated activities. Under this approach, by netting off the income that the company is likely to earn on activities such as commercial property income, we arrive at an estimate of the income that Network Rail requires from access charges (and network grant in lieu of access charges) if, overall, it is to earn a normal level of return. As part of PR08 we reviewed whether or not the current single till model provides the most appropriate incentives on the company and whether, for instance, separate price controls should be established for different elements of Network Rail's activities.
- 2.27 We decided that, at present, there is not a strong case for establishing separate railway and commercial tills given our statutory duties. There is a risk that such a dual till approach would increase Network Rail's short-term revenue requirement and hence increase the cost to funders, without material benefit to the industry. We consider that our focus should instead be on maximising the benefit that flows to the railway as a result of Network Rail's commercial activities.

Treatment of inflation and indexation

- 2.28 We are continuing to protect Network Rail from general inflation risk, by establishing the determination in real terms and indexing the access charges each year based on the November value of the all items retail price index (RPI).
- 2.29 We recognise that indexing Network Rail's revenues in this way does leave government with budgetary uncertainty with regard to the funding it provides each year. Given inherent uncertainty over the future level of inflation it is impossible for government to know what the exact funding requirement will be

in each year of CP4. Nevertheless, it would be inappropriate to leave inflation risk with Network Rail, something the company has no control over.

Separate price controls

2.30 We are providing separate price controls in CP4 for Network Rail's activities in both England & Wales and Scotland. By separate price controls we broadly mean:

- a separate determination of the revenue requirement and outputs for England & Wales and Scotland (in the context of the separate HLOSs and SoFAs);
- separate determination of access charges (though retaining a GB-wide variable usage charge price list);
- separate provisions for dealing with risk and uncertainty in the price control, e.g. re-openers;
- separate monitoring and enforcement of Network Rail's overall performance; and
- ensuring that outperformance or underperformance is ultimately retained or borne entirely separately.

2.31 Whilst we are establishing separate price controls for Network Rail's activities in England & Wales and Scotland, we recognise that Network Rail is a GB-wide company and finances itself on this basis. It is also important to note that our proposals do not require Network Rail to establish separate finance companies for England & Wales and Scotland.

Governance

2.32 We want to ensure that the framework we put in place for CP4 maximises the chances that Network Rail meets or exceeds the regulatory expectations and hence the reasonable requirements of its customers and funders. It is therefore essential that incentives throughout the company are aligned with those expectations and that effective corporate governance processes are in place, ensuring strong accountabilities and driving continuous improvements in Network Rail's performance.

2.33 Separately to PR08, we have been considering the adequacy of Network Rail's current governance arrangements, particularly the membership aspects, in order to inform a possible review of the corporate governance condition within its licence, alongside our broader review of the network licence. Earlier this year we commissioned a study from KPMG, aimed at increasing our understanding of the current issues around membership aspects of Network Rail's governance, and of the lessons that might be learned from other non-equity based organisations which might address any shortcomings in Network Rail's arrangements.

- 2.34 We published KPMG's final report¹³, which identified, amongst a significant divergence of views, a number of concerns held by members on the effectiveness of Network Rail's current governance structure, and outlined a series of options that might address these concerns.
- 2.35 Whilst KPMG's study was being carried out, Network Rail's members announced that they would be carrying out their own review, the findings of which will be announced after our determination has been published. We do not propose to look any further into corporate governance issues pending the outcome of the members' review. We will consider whether it would be appropriate for us to consider any changes to Network Rail's corporate governance licence condition once the members' review has been completed. This will be done as a separate exercise to our broader review of the network licence.

¹³ *Network Rail: Membership aspects of governance*, KPMG, August 2008. This may be accessed at www.rail-reg.gov.uk/upload/pdf/KPMG_membership.pdf.

PART B: OUTPUTS AND EXPENDITURE

3. Overview of our outputs and efficient expenditure assessment

Introduction

- 3.1 This chapter provides an overview of our assessment of outputs and efficient expenditure, which is set out in detail in chapters 4 to 12.

Network Rail's obligations

- 3.2 Network Rail is accountable for its management of the network through its contracts with its customers, through its general legal obligations (in particular its health and safety obligations) and through the obligations in its licences.
- 3.3 In PR08 we have assessed the efficient expenditure Network Rail needs to incur over CP4 to operate, maintain, renew and enhance the network to meet its legal obligations, to deliver the outputs the governments and other funders wish to buy, to satisfy the reasonable requirements of its customers and funders and, thereby, to meet the needs of passengers and freight customers.
- 3.4 At the same time we have defined the specific outputs for which the company is being funded, delivery of which will be an obligation under its network licence, and we are ensuring that an adequate framework is in place to monitor and to provide for enforcement of those obligations if necessary.

Our assessment of Network Rail's outputs and expenditure

- 3.5 Assessing the level of efficient operating, maintenance, renewals and enhancement expenditure that Network Rail needs to deliver its required outputs in CP4, and sustain asset condition for the longer term, is a core part of our work on PR08. The assumptions we make on the level of efficient expenditure are fundamentally important to our determination of the company's overall revenue requirement.
- 3.6 In undertaking this assessment we have considered the impact on safety management and also Network Rail's capability to deliver its work programme in CP4 – and our conclusions are included in this part of the document.
- 3.7 We have conducted all our assessments of outputs and expenditure very thoroughly. We have engaged with Network Rail throughout the course of PR08 and we have adopted a transparent approach to our work. We have undertaken a significant amount of work to review and challenge Network Rail's submissions, including its performance plans, the asset policies, efficiency assumptions and modelling tools (principally the infrastructure cost model) it has used as a basis for its plans. Network Rail

has worked with us constructively throughout PR08. The independent reporters have also provided significant input to PR08.

- 3.8 At the start of PR08 we said to Network Rail that we wanted it to do sufficient detailed work on its expenditure requirements and efficiency to inform its plans. Over the course of PR08 and its three main submissions to us (ISBP, SBP and SBP update) it revised its assumptions significantly in areas related to the volume of work it considers necessary in CP4, due to improvements in its own analysis and in response to our challenge. The company has not changed its headline efficiency assumptions throughout the process.
- 3.9 We asked Network Rail to set out its plans for England & Wales and Scotland separately. Building on this, we have undertaken separate assessments to produce figures for England & Wales and for Scotland, although much of our underlying analysis has been common to the whole network.

Structure of this part of the document

- 3.10 In the following nine chapters we set out Network Rail's output obligations and our assessment of the efficient level of expenditure required to deliver these:
- chapter 4 summarises the work we are doing to review Network Rail's accountability through its network licence and sets out in full the regulated output specification for CP4;
 - chapter 5 explains our assessment of the (pre-efficiency) expenditure on maintenance and renewals activity that we consider Network Rail will need to undertake in CP4. It also contains our assessment of the long run renewals expenditure requirement which is a key input to the calculation of the amortisation allowance (discussed further in chapter 15);
 - chapter 6 explains our assessment of Network Rail's operating expenditure proposals;
 - chapter 7 outlines our assessment of Network Rail's efficiency proposals and explains our own work on the scope for efficiency improvement;
 - chapter 8 sets out our determination on the improvements in OM&R efficiency that we consider are achievable by Network Rail in CP4;
 - chapter 9 contains our assessment of Network Rail's proposals on enhancement expenditure, including specific consideration of the scope for efficiencies;
 - chapter 10 contains our assessment of Network Rail's ability to deliver its capital programme in CP4;
 - chapter 11 contains our assessment of the safety elements of Network Rail's plans and the safety considerations we have brought to bear in our judgements on efficiency; and
 - chapter 12 sets out our overall assessment of the level of efficient expenditure we consider Network Rail needs to undertake in CP4, which feeds into our calculations of the revenue requirement.

4. Accountability and outputs

Introduction

- 4.1 This chapter summarises the work we are doing to review Network Rail's accountability through its network licence and sets out our determination of Network Rail's output specification for CP4.

The review of the network licence

Network Rail's obligations to stakeholders

- 4.2 It is important that Network Rail is free to manage its business efficiently and to respond to the changing needs of its customers and funders. The essential features of the manner in which it does this, and the delivery of its obligations in respect of outputs, will be enforced through the network licence (although where a relevant contract is in place we would expect contractual remedies to be explored first where this is possible within a reasonable timescale).
- 4.3 We are ensuring that the specific output requirements from PR08 and the more general licence requirements, taken together, provide a clear and comprehensive statement of Network Rail's overall obligations under the network licence. We are therefore reviewing the structure and content of Network Rail's network licence for the start of CP4. We consider it is appropriate to strengthen it in several areas, such as access planning and asset management, and to make both the scope of Network Rail's obligations and the purpose they meet clearer. We believe that this will help the company and its stakeholders to understand what is required of it, and will support our ability to enforce this if necessary.
- 4.4 Following discussions with Network Rail and stakeholders, we consulted on our proposals for a suite of changes to the network licence on 5 June 2008¹⁴, and on financial licence conditions on 17 July 2008¹⁵. There was broad support for these proposals but numerous comments about specific provisions. We will conclude our thinking in December and undertake the statutory consultation required so that changes can come into effect on 1 April 2009.

Governance and the management incentive plan

- 4.5 We want the regulatory framework we put in place for CP4 to maximise the likelihood that Network Rail meets or exceeds the regulatory expectations,

¹⁴ *Review of the Network Rail licence: consultation*, June 2008. This may be accessed at www.rail-reg.gov.uk/upload/pdf/366.pdf.

¹⁵ *Periodic Review 2008: licence review – consultation on financial conditions*, July 2008. This may be accessed at www.rail-reg.gov.uk/upload/pdf/pr08-cons_netlic_170708.pdf.

and hence the reasonable requirements of its customers and funders. It is therefore important that incentives throughout the company are aligned with those expectations and that effective corporate governance processes are in place. These must ensure strong accountabilities and drive continuous improvement in Network Rail's performance.

- 4.6 A key part of this is the licence requirement to put in place a management incentive plan (MIP). The purpose of the MIP is to ensure that the company's senior management are financially incentivised to deliver and outperform the whole range of outputs required by customers and funders at an efficient cost by providing bonuses for meeting and exceeding specified targets. We see it as a crucial part of aligning the incentives of Network Rail's managers with the public interest, complementing the financial incentives acting at the corporate level and reputational incentives.
- 4.7 As long as we are content that the MIP's design is not likely to create perverse incentives or lead to undesirable outcomes, the structure of the MIP is a matter for Network Rail.¹⁶
- 4.8 We have asked Network Rail to ensure that its MIP for CP4 reflects our determination, including the new financial framework. We propose in future to require Network Rail's remuneration committee to be transparent in its decision making process on management bonuses. In particular, we will require the committee to publish a statement explaining how it has arrived at its decision, including how it has taken into consideration each discretionary item in the plan.

Structure of output specification

- 4.9 In February 2008 we set out¹⁷ the structure of output obligations we intend to adopt for CP4. This included the following areas:
- top-level regulated output obligations which we set out below; and
 - disaggregated output obligations which will be fully defined in Network Rail's CP4 delivery plan. Some of these are already firm but others will need to be finalised by Network Rail and its stakeholders over the coming months.
- 4.10 Network Rail's CP4 delivery plan will therefore be an essential document, subject to a regulated change control mechanism. Network Rail will need to satisfy us that the plan is compliant with this determination. It will then become

¹⁶ Detail's of Network Rail's MIP can be found on its website at www.networkrail.co.uk/browseDirectory.aspx?dir=\Regulatory%20Documents\Regulatory%20Compliance%20and%20Reporting\Management%20Incentive%20Plan%20Statement&pageid=2893&root

¹⁷ *Update on the framework for setting outputs and access charges and strategic business plan assessment*, Office of Rail Regulation, February 2008. This may be accessed at www.rail-reg.gov.uk/upload/pdf/351.pdf.

a key reference for Network Rail's customers and funders, and for our monitoring. It will explain how Network Rail will deliver the outputs required of it. It will establish a range of reasonable requirements whose delivery will be enforceable under the network licence. The plan may also include elements clearly identified as aspirational which will not be enforceable.

- 4.11 We consulted on a notice for Network Rail's CP4 delivery plan in our draft determinations. The final notice¹⁸ is being issued to Network Rail concurrent with the publication of this determination.
- 4.12 Responses to our draft determinations broadly supported our proposals for the specification of outputs. We will publish a separate document dealing with the detailed/significant points raised. For the new network availability specification we consulted separately on 4 July 2008¹⁹; the key responses to this consultation and our views on them are included in this chapter.

Safety

- 4.13 The HLOS issued by the Secretary of State specifies safety improvement for the whole of the British mainline network to be achieved over the five years of CP4. It requires a 3% reduction in the risk of death or injury from accidents on the railway for passengers and rail workers.²⁰ The measurement of this risk will be by reference to the industry's RSSB Safety Risk Model. This is a more stable and reliable measure than one based solely on actual events, since the number of serious incidents in an average year is small.
- 4.14 We require Network Rail to set out in its CP4 delivery plan how the industry – working together through the RSSB and mechanisms such as the strategic safety plan – will deliver the HLOS target and specifically how Network Rail will deliver its contribution to this. Network Rail has responsibility for delivering its own contribution (but not that of the other parties).
- 4.15 Safety issues are discussed further in chapter 11.

Train service performance

- 4.16 Network Rail is required to deliver, by 2013-14, the improvements in the public performance measure (PPM) and the reductions in cancellations and significant lateness by sector as set out in the HLOS for England & Wales. In Scotland it is required to deliver the 2013-14 PPM figure in the Scottish HLOS (this covers services provided by First ScotRail). Network Rail is also required to deliver against trajectories for these same metrics for each intermediate

¹⁸ The final notice is included in annex C to this document.

¹⁹ The consultation document can be found on our website at www.rail-reg.gov.uk/upload/pdf/cons-netwrk_avail_KPI.pdf

²⁰ Measured in fatalities and weighted injuries per million passenger kilometres (for passengers) and per million hours worked (for rail industry employees).

year. These requirements apply to franchised and open access operators when taken together, and to franchised operators considered alone.

- 4.17 We are also setting maximum levels, for each year, for the number of passenger train delay minutes for which Network Rail is held responsible in England & Wales and in Scotland.
- 4.18 We are setting similar maxima for the freight train delay minutes for which Network Rail is held accountable across the network as a whole. These maxima are normalised for the volume of freight traffic, which tends to fluctuate more than the volume of passenger traffic.
- 4.19 The required trajectories are shown in tables 4.1 to 4.3. These all have the status of top-level regulated outputs.

Table 4.1: PPM annual average for passenger operators

| | 2008-09 (%) | 2009-10 (%) | 2010-11 (%) | 2011-12 (%) | 2012-13 (%) | 2013-14 (%) |
|--|-------------|-------------|-------------|-------------|-------------|-------------|
| England & Wales (by sector) – minimum | | | | | | |
| Long distance | 87.6 | 88.6 | 89.8 | 90.9 | 91.5 | 92.0 |
| London & South East | 91.2 | 91.5 | 92.0 | 92.4 | 92.7 | 93.0 |
| Regional | 90.1 | 90.5 | 91.0 | 91.5 | 91.9 | 92.0 |
| Total | 90.6 | 91.0 | 91.5 | 92.0 | 92.3 | 92.6 |
| Scotland – minimum | | | | | | |
| First ScotRail | 90.6 | 90.9 | 91.3 | 91.7 | 91.9 | 92.0 |

Note: 2008-09 figures are industry forecasts. HLOS targets in **bold** in shaded cells.

Table 4.2: Cancellations and significant lateness (England & Wales only)

| | % of services affected – maximum | | | | | |
|---------------------|---|---------|---------|---------|---------|---------|
| | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
| Long distance | 5.3 | 4.9 | 4.5 | 4.2 | 4.0 | 3.9 |
| London & South East | 2.3 | 2.3 | 2.2 | 2.1 | 2.0 | 2.0 |
| Regional | 2.7 | 2.6 | 2.5 | 2.4 | 2.3 | 2.3 |

Notes: 2008-09 figures are forecasts.

A train is significantly late if it arrives at destination 30 or more minutes later than the time shown on the public timetable. Partial and full cancellations are scored as 'significantly late'.

Table 4.3: Network Rail delay minutes for passenger and freight services

| | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|--|-----------|-----------|-----------|-----------|-----------|-----------|
| Passenger services (delay minutes) – maximum | | | | | | |
| England & Wales | 6,500,000 | 6,270,000 | 5,790,000 | 5,430,000 | 5,190,000 | 4,980,000 |
| Scotland (First ScotRail) | 455,000 | 436,000 | 410,000 | 391,000 | 386,000 | 382,000 |
| Freight services (delay minutes per 100 train km) – maximum | | | | | | |
| Total | 3.92 | 3.68 | 3.41 | 3.18 | 3.05 | 2.94 |

Note: 2008-09 figures are forecasts

- 4.20 Network Rail has proposed trajectories for PPM and for its own delay minutes for each passenger train operator, but they will not be treated as 'customer reasonable requirements' until we have accepted Network Rail's CP4 delivery plan which it will produce following further discussion with the operators.
- 4.21 Network Rail and freight operators are developing a new freight performance measure (similar to PPM) for freight services. In its CP4 delivery plan Network Rail must publish trajectories for each freight operator, either using the new measure or based on normalised Network Rail delay minutes, which will then have the status of reasonable requirements.
- 4.22 Annex d sets out our assessment of the incremental expenditure necessary to achieve these improvements in train performance.

Network capacity

- 4.23 The HLOS for England & Wales defines a number of specific schemes to increase capacity on key parts of the network. It also sets out capacity measures (essentially extra demand to be accommodated at specific load factors) which are to be met for a wider range of specific cities and routes.
- 4.24 Although the capacity measures are defined in terms of routes and services, Network Rail must also ensure that individual stations are able to accommodate the increased volume of passenger movements which are effectively provided for in the HLOS.
- 4.25 Certain schemes identified individually in the England & Wales HLOS (Thameslink, Reading, Birmingham New Street and outstanding parts of the West Coast programme at Stafford and Bletchley) are reasonable requirements and will contribute to meeting the HLOS capacity specifications.

- 4.26 This determination provides funding for further investment to deliver the whole of the HLOS capacity specification by the end of CP4 and this is a reasonable requirement. Network Rail's current plans include projects to lengthen platforms for trains on major routes into London, Manchester and Leeds, related power supply upgrades and station capacity improvements. However, we expect Network Rail to continue to refine these plans, working with operators and funders, to find ways of delivering the specification more economically. We have taken this into account in reaching our determination.
- 4.27 The determination also provides funding to begin to implement the strategic freight network (SFN) as required by the England & Wales HLOS. The SFN has been defined by Network Rail as a network of core trunk routes with sufficient capacity and appropriate gauge to carry expected freight flows. Network Rail has proposed a number of specific schemes and ring fenced funds for train lengthening and in-fill gauge enhancement schemes.
- 4.28 Network Rail must define clear deliverables and milestones for its programme of works in its CP4 delivery plan. Except where clearly identified as being 'aspirational' these will have the status of reasonable requirements under the network licence and Network Rail will be required to deliver them. There will be a process for change control (described below) to allow Network Rail to continue to refine the plans in agreement with relevant parties.
- 4.29 In Scotland, Network Rail is required to deliver the Airdrie-Bathgate and Glasgow Airport Rail Link projects, and to undertake a specific role in the Borders project as set out in the Scotland HLOS. Again, the delivery plan will need to set out milestones.

Network capability

- 4.30 Network Rail has now identified and resolved the majority of the discrepancies between published and actual network capability as required by ORR following the finding of a licence breach in 2006.
- 4.31 Any outstanding discrepancies between actual and published capability (whether or not identified through Network Rail's infrastructure capability programme of 17 March 2006) must be rectified by Network Rail without further funding. Any work to restore routes to published capability following a short-term network change must also be carried out without further funding.
- 4.32 As at 1 April 2009, baseline network capability requirements will be described in Network Rail's:
- Sectional Appendices;
 - GEOGIS database;
 - National Gauging Database; and
 - Route Availability Table, Scotland.

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/miles.

4.33 We will require Network Rail to provide us with electronic copies of this information. 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).

Network availability and the “seven day railway”

4.34 The railway network needs to be maintained, renewed and enhanced, and this requires engineering possessions to allow work to be undertaken safely and efficiently. In our draft determinations we said that we had developed new measures of the disruption to passengers and freight caused by possessions and that we would set targets for improvement in these. We subsequently published a consultation document explaining our proposals.²¹

4.35 The extent of planned disruptions caused by engineering works has increased in recent years. There has been more reliance on long possessions and a tendency for possessions to have an increasingly disruptive effect on rail users as the industry has changed its working methods away from keeping one line open while work takes place on an adjacent line.

4.36 Network Rail believes – and we and the industry agree – that its strategy of depending so heavily on long possessions is no longer acceptable. Users need a railway which better meets customer requirements for travelling at weekends and late in the evening. But this determination calls on Network Rail to undertake a major programme of enhancement projects which will add to disruption in the short term. This makes it all the more important to find less disruptive ways of carrying out such work.

4.37 Such changes have been discussed for some time and we need to ensure progress is made to implement them. We therefore consulted on proposals to set maximum levels for the disruption from planned possessions as measured by new possession disruption indices (PDIs)²² for passengers and freight traffic.

²¹ *Consultation on network availability and the seven day railway*, Office of Rail Regulation, 4 July 2008. This may be accessed at www.rail-reg.gov.uk/upload/pdf/cons-netwrk_avail_KPI.pdf

²² **Passenger index (PDI-P)** - measures the impact of engineering possessions in terms of the economic value of the excess journey time passengers experience, normalised by total train-km; and
Freight index (PDI-F) - measures the ‘unavailability’ of track for freight use, weighted by the level of freight traffic operated over each section of track.

4.38 These indices take a base value of 1.0 in 2007-08. In future they will show by what proportion the disruption experienced by passengers and by freight operators has increased or reduced relative to that in the base year.

4.39 Tables 4.4 and 4.5 show the levels Network Rail is required to deliver (or improve on) during CP4.

Table 4.4: PDI regulated output trajectory for passengers (2007-08=1.0)

| | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|-----------------|---------|---------|---------|---------|---------|
| PDI – Passenger | 1.02 | 0.91 | 0.83 | 0.68 | 0.63 |

Table 4.5: PDI regulated output trajectory for freight (2007-08=1.0)

| | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|---------------|---------|---------|---------|---------|---------|
| PDI – Freight | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

4.40 The effect of these targets is to require a progressive reduction in disruption to passengers so that by the end of CP4 there is 37% less than in the base year (2007-08). At the same time there should be no increase in the level of disruption experienced by freight operators.

4.41 The trajectories take into account initial implementation of the “seven day railway” concept on parts of the network, for which £220m of additional funding is being provided (see chapter 9). We expect Network Rail to work with operators to refine its approach, including the selection of routes to receive investment, and to describe this in more detail in its CP4 delivery plan.

4.42 The PDIs are new metrics and it will be important that we monitor them particularly carefully. We intend to use a number of supplementary key performance indicators (KPIs) that have been developed in conjunction with the PDIs. These KPIs will not form regulated outputs, but are designed to:

- provide information on areas which are not fully reflected in the PDIs;
- help us to understand movements in the PDIs; and
- act as a check against any perverse behaviours that might result from strategies designed to drive improvements against the PDIs.

Consultation responses

4.43 Network Rail welcomed the inclusion of incremental funding to support the move towards a seven day railway. It believed that the proposed approach to the PDI-P is appropriate, but it expressed concerns about the calculations that underpin the proposed target. Specifically:

- that the “enhancement weightings” (which estimate the disruption due to enhancement projects, relative to the same spend on renewals) did not take into account the location of the enhancement schemes;

- that activity volumes in the PDI-P trajectory do not include enhancements funded outside the review (e.g. Crossrail) and so the disruption associated with these schemes is not captured in the trajectories;
 - that there are technical errors in the model used by ORR to calculate the trajectory; and
 - that there is a high level of risk around the target hence the ORR should assess whether the target is reasonable based on actual results as CP4 progresses.
- 4.44 On the PDI-F, Network Rail said our inclusion of a single line working (SLW) factor in the metric – to take account of the reduced disruption when, for example, there is engineering work on one line but the adjacent line stays open – was unworkable.
- 4.45 While agreeing with the need for monitoring KPIs, Network Rail noted that some of the measures will require more significant changes to data collection processes and/or systems:
- 4.46 We received 23 other responses. The main themes were:
- that there should be a review mid-CP4 to assess whether the new measures were working as intended and whether the trajectory set was appropriate, or alternatively some form of shadow running;
 - that the trajectories for PDI-P and PDI-F were not challenging enough and, in particular, the benefits of 'stage 2', based on significant new investment, could be brought forward;
 - that a 'one-size fits all' approach should not be adopted by Network Rail – possession strategies should be developed around the business needs of operators; and
 - some new or amended KPIs were proposed.

Our views

- 4.47 We do not agree that the enhancement weightings should be changed as Network Rail suggests (which would make the trajectories less demanding). We believe that our overall approach uses reasonable assumptions which in some areas arguably favour Network Rail.
- 4.48 We explained in our consultation that the trajectories do not take Crossrail works into account; we would expect Network Rail to seek modifications to them if this is appropriate when Crossrail plans become firmer. We do not believe that the impact on the PDIs of other projects funded outside PR08 would be material, but we are content to consider the case for changes to the trajectories in due course, if Network Rail provides convincing evidence.
- 4.49 We have reviewed the model in the areas where Network Rail has said there are errors and we believe that it is satisfactory.

- 4.50 The SLW factor was introduced to ensure that benefits to freight of single line working were captured in the PDI-F measure. If we remove this factor, the measure will not capture these benefits and it will be more difficult for Network Rail to achieve the target. Network Rail proposes that the impact of SLW is monitored separately; in our view this complicates the process and adds no benefits. We do not propose to make this change.
- 4.51 We understand the concerns about using a new metric for which there is no real track record, meaning somewhat greater uncertainty when making projections. This is one reason for the importance of the monitoring KPIs to help interpret changes in the new measures. But we are mindful of how long it has taken the industry to reach this point; we do not believe it is acceptable to delay setting an objective and we consider that 'shadow running' or scheduling an automatic review would undermine the incentive on Network Rail to deliver the trajectories. We are therefore confirming the trajectories to be regulated outputs for years 1 to 5. We will closely monitor progress against the trajectories and against the assumptions on which they are based, and in the event of a failure by Network Rail to meet either trajectory we will take all relevant factors fully into account when determining whether this amounts to failure to comply with obligations under the network licence.
- 4.52 Although we understand why some consultees would prefer more challenging trajectories we believe that they are based on reasonable assumptions and that no compelling evidence has been produced to justify such a change.
- 4.53 We agree the need for possession planning and progress with the "seven day railway" initiative to be undertaken working with operators and taking into account local circumstances on different parts of the network. This should include the potential to realise 'network' benefits for freight. We intend to monitor the benefits from the additional expenditure on each of the priority routes which Network Rail identifies.
- 4.54 Many suggestions on improving the specification of supporting KPIs were helpful. We will take these forward in discussion with Network Rail and the industry in preparation for our monitoring in CP4.

Stations

- 4.55 We have agreed a new station stewardship measure to replace the previous station condition index as a better measure of the underlying condition of station assets²³. In 2007 Network Rail completed condition surveys of around 90% of its stations and in September 2008 it provided us with results showing the average condition of stations using this new measure.

²³ This measure does not take into account the type of facilities at stations, for which a separate index is used.

- 4.56 Under this determination, Network Rail is funded as a minimum to maintain average condition scores within each station category A to F²⁴ across the network, and to maintain average station condition (across all station categories) in Scotland. The baseline (minimum) levels of average condition, based on the survey data provided by Network Rail, are shown in table 4.6.

Table 4.6: Station stewardship targets

| Station Category | Station stewardship measure minimum average score at end of CP4 |
|------------------|--|
| All network | |
| A | 2.48 |
| B | 2.60 |
| C | 2.65 |
| D | 2.69 |
| E | 2.74 |
| F | 2.71 |
| Scotland | |
| All stations | 2.39 |

- 4.57 This obligation applies before taking into account improvements which are to be funded under the England & Wales national stations improvement programme (NSIP). We need to be satisfied that NSIP funds are used in a genuinely incremental way. We therefore require Network Rail to provide this information in future annual returns for stations in England & Wales:
- the average condition for each station category A to F;
 - the average condition for each station category A to F excluding stations benefiting from NSIP funding (these average conditions must be maintained or improved); and
 - the average condition for each station category A to F for only those stations benefiting from NSIP funding (we would naturally expect that these average conditions will improve).

Depots

- 4.58 We explained in February 2008²⁵ that we had decided that it is not appropriate or necessary to set a top level regulated output for the condition of light maintenance depots owned by Network Rail, but that we expect Network Rail

²⁴ The categories reflect the different sizes and passenger throughputs of stations.

²⁵ The document *Update on the framework for setting outputs and access charges and strategic business plan assessment* may be accessed at www.rail-reg.gov.uk/upload/pdf/351.pdf.

to demonstrate that its plans are consistent with maintaining these depots on a sustainable long-term basis.

- 4.59 Network Rail confirmed in its SBP update that, having reduced the activity and expenditure planned for franchised stations compared with the SBP, it has sufficient free capacity to achieve steady state spending on maintenance and renewal activity at light maintenance depots in CP4.
- 4.60 Following Network Rail's latest survey of the condition of its depots, we expect it to determine the current average depot condition and to show in its CP4 delivery plan whether and how this will change over CP4. This will have the status of a customer reasonable requirement.

Customer satisfaction

- 4.61 We regard it as of prime importance that Network Rail measures, and gives real priority to improving, the extent to which its direct customers (passenger and freight train operators) are satisfied with its behaviour and performance. We therefore strongly welcome confirmation from Network Rail's remuneration committee that, from the start of CP4, in deciding whether to exercise its discretion to reduce bonuses under the Management Incentive Plan, the committee would take into account (amongst other things) the satisfaction of passenger and freight train operators.
- 4.62 We believe that this is the most appropriate way for customer satisfaction to be taken into account, and we therefore will not set any regulatory output requirements in this area.

Asset serviceability and sustainability

- 4.63 We explained in February 2008 that we do not believe it necessary to set regulated output requirements for asset management or condition (except for station condition). We would instead monitor against a dashboard of indicators, including both condition forecasts and activity plans, that Network Rail must set out in its CP4 delivery plan.
- 4.64 These projections should represent sustainable efficient asset management consistent with this determination, which is itself substantially based on Network Rail's Strategic Business Plan and asset policies. If there is a material departure from the projections in the delivery plan during CP4, we will require Network Rail to explain this and to demonstrate clearly that it is still complying with its asset management licence obligations.
- 4.65 The dashboard of condition indicators that we will use is extensive. Much of its detail varies little from our current monitoring regime because it is important to have continuity in the time series of the measures. It is also important to have a clear baseline for the start of CP4, which means that indicators must be well understood and consistently measured.

- 4.66 We will not be using Network Rail's asset stewardship index (ASI) to monitor overall network condition. Network Rail has made some progress in refining and improving the balance and disaggregation of component measures that make up the ASI, and it is those individual elements that will provide the primary focus of our asset monitoring. These measures are set out in detail in table 4.

Table 4.7: Principal asset condition monitoring measures (total network)

| | Measure | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|--|--------------|---|---------|---------|---------|---------|
| Good track geometry | See note 1 | 135.2% | 135.3% | 135.4% | 135.5% | 135.6% |
| Poor track geometry | See note 2 | 2.30% | 2.27% | 2.25% | 2.22% | 2.20% |
| Geometry faults per 100 track km (primary and secondary) | New measure | 4.4% reduction per annum | | | | |
| Immediate action geometry faults per 100km (network) | New measure | 4.4% reduction per annum | | | | |
| Immediate action rail defects per 100km (primary and secondary) | New measure | 0.9% reduction per annum | | | | |
| Rail breaks per 100km (network) | M1 modified | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 |
| Civils assets subject to (special) examination (number) | New measure | 1,458 | 1,444 | 1,429 | 1,415 | 1,401 |
| TSRs imposed (severity index) | M4 | 113 | 112 | 111 | 110 | 108 |
| Station stewardship measure - station categories A-F | Modified M17 | Set as top level regulated targets | | | | |
| Light maintenance depot stewardship measure | Modified M19 | Network Rail to define in CP4 delivery plan | | | | |
| Sub station and contact systems condition | M13-M16 | 1% per annum improvement in condition measure | | | | |
| Traction power incidents causing train delays of more than 500 minutes | M11, M12 | 71 | 67 | 64 | 61 | 58 |
| Signalling failures causing delays of more than 10 minutes | M9 | 18,126 | 17,587 | 17,035 | 16,500 | 16,205 |
| Points and track circuit failures | KPI NR 6,9 | 12,471 | 12,008 | 11,382 | 10,764 | 10,496 |
| No. of TSRs applied to structures in poor condition | M4 | Network Rail to define in CP4 delivery plan | | | | |
| Asset volume renewal measures | M20-M29 | Network Rail to define in CP4 delivery plan | | | | |

Notes: 1. Based on an index measure of track quality in the 'good' or 'satisfactory' geometry bands. 2. Based on an index measure of track quality in the 'poor' or 'worse' geometry band. Network Rail has provided trajectories for these in its SBP update. We consider that these are reasonable and we will assess Network Rail's stewardship of its infrastructure by monitoring its performance in relation to these forecasts (supplemented by consideration of a further range of diagnostic KPIs).

- 4.68 We will also keep under review the progress Network Rail makes in delivering its proposed activity volumes. This provides an important leading indicator of future network serviceability.

CP4 delivery plan: change process

- 4.69 We confirmed in June 2008 that there should be a mechanism to allow agreed changes to some of Network Rail's disaggregated CP4 outputs to enable it to flex its plans, in consultation with its stakeholders, to adapt to changing circumstances and requirements. The process will not weaken Network Rail's accountability for delivery. Train operators will have a key role in challenging any changes proposed by Network Rail. We will, where necessary, review proposed changes ourselves.
- 4.70 Certain projects have bespoke change control arrangements in place (e.g. the Thameslink project), in these cases the existing process will apply but we will investigate complaints and monitor overall delivery.
- 4.71 For other changes the change control process covers:
- **defined enhancement funds:** where such funds (e.g. the NSIP and Strategic Freight Network funds) have not been fully allocated when the delivery plan is published, changes to the outputs which are agreed through the relevant governance process may be made and should be notified to ORR;
 - **performance:** Network Rail may change a disaggregated performance commitment where it has agreed this with the operator concerned (e.g. through the JPIP process) and notified ORR;
 - **capacity:** this applies to schemes in the delivery plan which are required to deliver the capacity specifications of the England & Wales HLOS (but not to those described as 'specified schemes' in our determination). If Network Rail proposes a change to these schemes it must consult relevant stakeholders (which may include operators and funders). It must provide us with the results of its consultation and with analysis showing how the proposed change is consistent with the HLOS requirements; this should be based on the model which it has previously used to demonstrate compliance of the SBP. We will approve the change if we are satisfied that the HLOS requirements are still met, unless there are outstanding stakeholder objections which we believe amount to legitimate grounds for refusing the change, in accordance with our duties.
 - **other enhancement projects:** If Network Rail wishes to change its plans for other enhancement projects it should consult relevant operators and seek their agreement. It should provide ORR with the results of this consultation. We will approve the change if we are satisfied that this is consistent with the principles on which we originally included the scheme in the determination, unless there are outstanding stakeholder objections which we believe amount to legitimate grounds for refusing the change, in accordance with our duties.

- 4.72 In our advice to ministers we said that there would be merit in enabling the industry to 'fine-tune' the regulatory determination for Network Rail if it became apparent that another party could contribute to delivery of an HLOS output more efficiently. Our proposals were widely supported and we have since engaged with stakeholders to explore the practicalities in more depth. Implementing such changes should require the minimum of regulatory intervention. We confirmed in June 2008 our belief that the best option is for Network Rail to enter directly into commercial negotiations with relevant operators – something it can do now. Our role is to facilitate this within the wider regulatory regime. We are defining PR08 outputs and the regulatory framework with flexibility to ensure that there are no obstacles to such 'fine tuning'. The change mechanism will be consistent with this approach. We will make changes to the regulatory accounts so that any 'fine tuning' transactions relating to capital expenditure and the RAB can be separately identified.
- 4.73 Network Rail's CP4 delivery plan may also include clear statements in relation to aspirational output targets. Network Rail will be free to change these, but must notify us and other interested parties of changes.
- 4.74 We expect that Network Rail will propose changes that already have the full support of its stakeholders and it should provide evidence of this to us. This will reduce the need for us to consult stakeholders separately and hence minimise timescales for processing and consideration.
- 4.75 Network Rail should publish changes made in accordance with this process on its website.

CP4 Delivery Plan notice

- 4.76 Condition 7 of Network Rail's network licence requires the company to prepare a business plan no later than 31 March each year. Network Rail's 2009 business plan, the delivery plan for CP4, will serve as the plan to describe how it will meet its obligations under this determination. It will therefore need to show how Network Rail will deliver the full range of outputs, both top level outputs specified by us and disaggregated outputs determined by Network Rail after full consultation with its stakeholders.
- 4.77 Concurrent with the publication of this determination we are issuing a notice requiring Network Rail to provide details of its final proposed outputs by the end of February 2009.²⁶ Network Rail, in its response to our draft determinations, has stated that before this it will provide train operators with draft output trajectories for CP4 in respect of performance, safety and the possessions disruption index, plus draft route plans including proposed enhancements. We expect such plans to include milestones for enhancement projects. We will consider any outstanding objections to Network Rail's

²⁶ A copy of the notice is included in this document as annex C.

proposals and will assess them to ensure that they are consistent with this determination.²⁷

- 4.78 Network Rail will then publish its finalised delivery plan by the end of March 2009.

Environmental initiatives

- 4.79 Our sustainable development policy was published in April 2007. It emphasised the important role that the industry has to play in developing and maintaining a sustainable railway system and in promoting and enhancing the sustainability and environmental advantages of travelling by rail as opposed to other transport modes. Work being undertaken across the industry to achieve this is now more important than ever.
- 4.80 Our sustainable development policy statement indicates that we will review the need to introduce new targets and incentives to ensure that sustainability issues are managed effectively across the industry. We are not setting specific environmental output requirements for Network Rail in CP4, although we will review this again for CP5.
- 4.81 The SBP contains a number of specific initiatives and associated targets on environmental issues ranging from plans to reduce carbon emissions from non-traction energy by 20% during CP4 to a 60% recovery or recycling of non-track waste. These are worthwhile objectives and it is encouraging that Network Rail is formally setting itself measurable targets. We also understand that Network Rail is implementing initiatives to measure and improve its, and the industry's, environmental performance. These include improving fuel efficiency / CO₂ emissions associated with maintenance and renewal activity, the wider implementation of regenerative braking, the introduction of electricity metering to facilitate more efficient driving by train operators, and climate change adaptation.
- 4.82 We will continue to monitor critically Network Rail's progress against its environmental initiatives.

²⁷ We must check that the plan is consistent with the determination, but this will not amount to 'approval' of the plan. It is not for us to approve Network Rail's delivery plans.

5. Maintenance and renewal expenditure

Introduction

- 5.1 This chapter sets out our assessment of the expenditure that Network Rail needs to maintain and renew the infrastructure during CP4. It explains how we made this assessment and the reasons for our conclusions. It includes references to issues that were raised in response to our draft determinations.
- 5.2 This part of the document is about *what* maintenance and renewal work we believe Network Rail will need to undertake during CP4. It focuses on the scope of its asset management programme and it discusses the volumes of work that we consider to be justified. This is therefore our assessment of the quality of Network Rail's plans for managing the fixed infrastructure of the railway and the efficiency of Network Rail's decision making in the specification and timing of the maintenance and renewal programmes.
- 5.3 In its response to our draft determinations Network Rail emphasised the importance of maintaining flexibility to vary activity volumes where this is necessary to deliver the regulated outputs efficiently. We agree; we are not defining activity volumes as regulated outputs, but we will include them as an important element of our monitoring activity in CP4 (see chapter 30).
- 5.4 Of course, to arrive at a revenue requirement it is then necessary to consider what this work should cost. All references to costs in this chapter are on the basis of 'pre-efficient' expenditure. This is what the work would cost fully reflecting the efficiency gains that Network Rail will have made by the end of CP3 but before taking into account the further improvement we believe it can achieve as CP4 progresses (this is considered in chapters 7 and 8).
- 5.5 We then set the CP4 figures in the context of an assessment of the average asset renewal expenditure that we believe would be required over the next 35 years to sustain the condition of the existing network. These long-run figures are used to determine the amortisation allowance that forms part of the calculation of Network Rail's revenue requirement.
- 5.6 We have undertaken separate assessments to produce figures for England & Wales and for Scotland, although of course much of the analysis – and hence the commentary – applies across the whole network.

Network Rail's plans

- 5.7 For the network as a whole Network Rail has proposed, in its SBP and the update, pre-efficiency expenditure of £5.3bn on maintenance and £12.9bn on

renewals during CP4 (of which £0.5bn and £1.5bn respectively are in Scotland). Table 5.1 shows the breakdown of these plans by asset category.

Table 5.1: Network Rail's CP4 pre-efficiency expenditure proposals

| (2006-07 prices) | Network Rail's proposals for CP4 | Comparison with CP3 |
|--|----------------------------------|---|
| Infrastructure maintenance | | |
| Inspections plus reactive & planned work on track, signalling, telecommunications, power supply and plant & machinery | £5,311m | Activity levels effectively continue maintenance delivery in line with the 2008-09 volumes |
| Renewals | | |
| Track: plain line, switch & crossing, drainage and off track works | £3,991m | Volumes 5 – 6% lower than in CP3 |
| Signalling: full and partial renewals, life extension work, level crossing renewals, ERTMS expenditure | £2,565m | Total workload similar to CP3 but more evenly spread and with different weighting of activities |
| Telecommunications: completion of GSM-R mobile network, renewal of fixed telecoms & station information systems etc. | £887m | Activity lower than in CP3 reflecting completion of major FTN/GSM-R programmes during CP4 |
| Electrification: AC & DC distribution and contact equipment & system control | £684m | Significantly higher than CP3 levels |
| Civil engineering: all works (except routine inspection) to bridges, tunnels, walls, earth structures, coastal defences etc. | £2,198m | Significantly higher than CP3 levels |
| Operational property: maintenance and repair of stations, light maintenance depots, lineside buildings & maintenance unit buildings | £1,480m | Significantly higher than CP3, mainly due to the programme of work on major (managed) stations |
| Plant & machinery: on track machinery and fixed plant | £402m | Slightly below CP3 levels |
| Other renewals: IT, corporate offices, miscellaneous schemes | £731m | Below CP3 levels |

5.8 These figures compare with the equivalent CP3 figures of £5.9bn and £11.6bn respectively. Two key issues for our assessment have therefore been to investigate:

- why Network Rail believes it needs to undertake an even higher level of renewal activity than in the current control period, during which it has begun to tackle a bow-wave of asset renewals and generate significant improvements in the performance and reliability of the infrastructure; and
- the industry's ability to deliver the scale of activity now being proposed. In addition to the renewal programme, CP4 will also see a much greater scope of network enhancement that will drive significant additional requirements for infrastructure activity.

Methodology

5.9 We have undertaken our assessment by means of a detailed analytical process that began in earnest with Network Rail's initial strategic business plan in June 2006. Since then we have reviewed and challenged Network Rail's business planning assumptions and methods, and judged the extent to which we believe it has made a sufficiently robust and well justified case for the expenditure and activities that it has set out in its SBP update and in its response to our draft determinations.

5.10 Our assessment consisted of structured programmes of analysis to examine the detail of the high level figures provided by Network Rail in its SBP in each of the core expenditure categories. There were several key strands:

- the quality of the asset policies being applied to determine maintenance and renewal activities, and their justification in terms of the extent to which they represent an efficient minimum whole life cost approach;
- how activity volumes have been determined – either by bottom-up specified items of work in planning 'workbanks' or (in the longer term) by use of forecasting models. The infrastructure cost model (ICM) is the major source of activity forecasting;
- consideration of the influence of data quality on activity forecasting;
- the efficiency of the activity costs used in the ICM;
- the quality of links between activities and projected outcomes, especially in terms of the outputs Network Rail is required to deliver in CP4, e.g. train performance; and
- the deliverability of the activity levels proposed.

5.11 Most of our analysis was progressed through extensive 'challenge' sessions with Network Rail, to probe the basis for the SBP expenditure plans. In several cases we carried out site visits and inspections to review the justification for specific planned activities and to test how 'on the ground' evidence corroborated the approach put forward in the SBP. In this work our in-house engineering expertise was supported by a technical panel of senior

industry engineering experts; we also commissioned some specific consultancy studies.

- 5.12 At the same time we developed a bottom-up assessment of the efficiency potential in each main area of activity, looking (for example) at work mix and delivery processes. This assessment provided key evidence to support our determination of CP4 efficiency assumptions (see chapters 7 and 8).

Overview of findings

- 5.13 Detailed analysis of the proposed activity volumes and levels of expenditure in CP4 follows in the main part of this chapter. Our overall view of Network Rail's SBP expenditure proposals can be summarised in three broad categories:

- those where the policies are clear, the modelling of CP4 activity volumes is considered to be relatively robust and where those activity levels are in line with, or even below, the emerging levels of activity in CP3. Track, signalling, telecoms and plant and machinery renewals (representing 61% of Network Rail's proposed renewals expenditure) fall in this category, as does the proposed maintenance expenditure;
- those where there are also clear asset policies and we consider the activity volumes to be relatively robustly modelled, but where the proposed level of activity in CP4 is significantly higher than equivalent levels in CP3. Electrification and operational property (17% of Network Rail's proposed renewals expenditure) fall into this category; and
- those where Network Rail has proposed significant increases in renewals but in our judgment, either through policy definition and/or application and issues within its modelling, it has not produced evidence that substantiates its case. This applies especially to civil engineering expenditure plans (17% of Network Rail's proposed renewals expenditure).

Responses to draft determinations

- 5.14 Few respondents commented on this aspect of our draft determinations and those who did were largely supportive. Network Rail disputed a number of our conclusions and we address their responses in the sections dealing with the relevant asset types.

Asset policies

- 5.15 The full suite of Network Rail's revised asset policies and supporting policy justification documents was published with the SBP. Using our independent asset management reporter we have carried out a major review of these key documents to assess (a) how Network Rail's policies have progressed, (b) the extent to which they substantiate the technical solutions and planned maintenance and renewal interventions and demonstrate that they are the most economically efficient, minimum whole life cost solutions and (c) the further opportunities to develop and improve the policies in future.

- 5.16 Network Rail has made progress in documenting its asset policies consistently and in seeking to align them with the business requirements of different parts of the network. Some are better developed than others, and Network Rail has sensibly focused on the assets (especially track) that are most business critical and for which proposed expenditure is greatest. Detailed points about individual policies are discussed later.
- 5.17 However, we remain disappointed that Network Rail has not made more progress in developing life cycle cost analysis to support its policy choices in all asset categories. It has made a start but more needs to be done to put the asset management regime on a more robust footing. For this review, although we have sought to reach conclusions about minimum whole-life expenditure, we have not seen analysis that unequivocally confirms the CP4 plans to be the most efficient, minimum whole life solution for Britain's railways.

Infrastructure cost model

- 5.18 Network Rail's ICM has been a key tool, translating Network Rail's asset policies into activity and expenditure projections. It has been under development since 2005. The first version was used to prepare the ISBP; further development led to version 2 that was used to prepare the SBP. The ICM forecasts activity levels, costs and outputs at a fairly detailed level across the network (some 300 'strategic route sections') over a 40 year period.
- 5.19 The development of the ICM is a significant undertaking and overall we are pleased with the progress Network Rail has made. In particular, we welcome the closer working between the ICM development team and the engineering teams in Network Rail.
- 5.20 We asked the independent reporter, Halcrow, to complete an audit²⁸ of the model's computational accuracy. This uncovered no errors that materially impacted overall expenditure forecasts. It did however uncover several errors that affected the accuracy of model calculations, and Network Rail corrected these in the version of the model that accompanied the SBP update.

Track renewals

Overview

- 5.21 Network Rail proposed a slightly lower level of track renewal activity in CP4 than it will have delivered by the end of CP3. Its pre-efficiency expenditure proposal is £3991m to deliver the core volumes shown in table 5.2.
- 5.22 Delivery of track renewals in CP4 is expected to change significantly from the delivery processes employed in the current control period. Notwithstanding moves towards the seven day railway concept discussed in chapter 9, Network Rail is expecting to improve efficiency and productivity by

²⁸ *Audit of ICM v2*, Halcrow, March 2008. This may be accessed at www.rail-reg.gov.uk/upload/pdf/pr08-halcrowaudit-130308.pdf

implementing modular plain line and switch and crossing renewals methods and by introducing more high output track renewals equipment. This determination takes these changes into account.

Table 5.2: Network Rail's core track renewals volume proposals for CP4

| | CP4 volume proposed by Network Rail | Average annual % of network renewed or treated |
|--|--|---|
| Rail | 4146 km | 2.7% |
| Sleepers | 3459 km | 2.2% |
| Ballast | 3769 km | 2.4% |
| Switches & crossings (equivalent units) | 2248 units (1795 full renewals) | 2.3% (1.8% fully renewed) |

5.23 Network Rail proposes a significant increase in track drainage renewals, with CP4 expenditure rising to approximately £100m (pre-efficiency). We welcome this as an important means of improving the condition and reliability of the track whilst also reducing its life cycle costs; we have made no adjustment to this element of the proposed expenditure. Two train operators particularly supported this approach in their responses to our draft determinations, emphasising how poor drainage has exacerbated the impact of flooding. Although Network Rail has argued that life cycle financial benefits will take time to emerge, we expect to see the performance benefits emerging much more quickly in CP4. We also expect Network Rail to have in place adequate monitoring so that it can demonstrate how this drainage expenditure is being used and the benefits that it generates.

Assessment

5.24 Overall we have concluded that there is a considerable and persuasive body of evidence that broadly supports the activity volumes proposed by Network Rail. In particular, we note that:

- the track asset policy appears to reflect a soundly judged, evidence based approach to managing the track system. Our review concluded that it is one of the most robust asset policies, founded on sound engineering principles and differentiating well between asset management regimes and output requirements for different types of route. For example, Network Rail plans to undertake a greater volume of partial renewals of switches and crossings on certain non-primary routes than it has previously carried out;
- forecasting of track renewal volumes in the ICM is generated by applying typical service life assumptions. We have used the independent reporters and our expert technical advisers to review these assumptions; their work has enabled us to conclude that the model uses sensible rules to reflect

asset condition and observed deterioration, thus generating realistic forecasts of future renewals volumes;

- the accuracy of track system data (e.g. GEOGIS) has been improved recently. While we still retain some concerns about overall data quality, we do not consider that this is of sufficient significance to create substantial errors in activity forecasting in the ICM;
- the annual percentages of asset renewal indicate realistic steady state component lives in the region of 35 – 45 years; and
- there is a bow-wave created by peaking of the renewals cycle, where track renewed in the 1970s/1980s requires replacement because its life has expired and an increasing performance risk on the primary routes. The increase in renewal volumes during CP3 has begun to address this, and although volumes in CP4 are somewhat less we expect this age profile to remain a significant influence on activity levels for the next few years. The proposed rate of renewal (2.2% - 2.7% per annum) is in the range that we would expect to see during CP4, given that rates of renewal during the late 1970s and early 1980s are known to have run as high as 3% per annum. Beyond CP4 we expect track renewal volumes to fall steadily, and we have reflected this in our long run average expenditure assessment.

5.25 However, we are making minor reductions to the volumes of plain line track renewals proposed by Network Rail because we believe that:

- there are further opportunities to reduce the amount of plain line renewal by local engineers applying objective risk-based criteria to prioritise renewals. For example, we believe that some rail on lower category primary routes is being removed simply because the policy requires it, even though the defect history does not suggest it to be necessary.
- increased attention to drainage, better maintenance, improving standards of renewal and more consistent application of policies in the specification of work to minimise whole life costs should all lead to better reliability and longer asset lives (although we accept that the principal asset life benefit will be in subsequent control periods).

5.26 The first point is demonstrated by evidence from our site sampling of proposed track renewal works that have been fully specified and are in the workbanks for 2009-10. Since the draft determinations, our track consultant has inspected further plain line sites on primary routes. His consolidated report describes 36 inspections, of which 25 are for the 2009/10 workbank and therefore have been peer reviewed within Network Rail to validate the proposals. Of these 25 sites, our consultant judged two to be scheduled five years prematurely, four to be justified in their timing but over-scoped to some degree, and two to be under-scoped.

5.27 We have discussed these findings with Network Rail. It claims that the proposed works are driven by performance considerations rather than solely by engineering condition, but it has not been able to furnish any performance data or whole life cost analysis to justify its proposals.

- 5.28 Network Rail also does not believe this to be evidence that it is over-stating aggregate volumes in its modelling. Whilst we agree that ICM forecast volumes are based on broadly appropriate service lives, the inspections indicate to us a marginal tendency to apply over-conservative service life assumptions and to opt for a renewals solution where a more cost effective maintenance regime is still viable, particularly considering the lack of objective criteria available to local engineers in reaching consistent priorities for the renewal job-bank.
- 5.29 We therefore continue to believe that the proposed expenditure on track renewals in CP4 is a little higher than is necessary with consistent application of good engineering judgment, and we confirm that we have assumed a 5% reduction on the figures on the SBP.
- 5.30 In our draft determinations we reduced the figures for full and partial renewals of switches and crossings by 5%. We believed there was a general over-scoping of S&C work as Network Rail's track asset policy appears to preclude partial renewals on primary routes. Evidence from our site inspections indicated that partial renewals were possible on the lower spectrum of primary routes without affecting reliability.
- 5.31 Network Rail challenged this reduction in its response, and noted that their modelled expenditure actually allowed for such partial renewals. They have stated their intention to specify partial renewals on primary routes in CP4 and to re-word the asset policy accordingly. We accept this and have now accepted the S&C renewal volumes proposed by Network Rail.

Deliverability and efficiency

- 5.32 Since the proposed volume of track renewal in CP4 is rather less than current levels we do not believe that resourcing issues would constrain delivery.
- 5.33 Delivery efficiency will be the subject of considerable change during CP4. In addition to the increasing introduction of modular renewals techniques for both plain line and switches and crossings, we note that efficiencies will also be driven by work mix and Network Rail's selected renewals methods. We believe that the company renews too much ballast using expensive full excavation rather than more cost effective ballast cleaning methods. We have taken this consideration into account in our efficiency analysis.

Conclusions

- 5.34 Taking these factors into account, we have concluded that plain line renewals should be reduced by 5%, but there should be no reduction for other volumes such as switches and crossings, drainage or ballast cleaning.
- 5.35 On this basis, the required pre-efficient expenditure for track renewals during CP4 would be £3,869m, a reduction of £123m on Network Rail's SBP figure (compared with a reduction of £171m in the draft determinations).

5.36 For the network as a whole, the adjustments we have made lead to the expected volumes of major asset renewals shown in table 5.3.

Table 5.3: Assessed volumes of major track asset renewals in CP4

| | Average annual volume | Indicative total volume |
|----------------------|---|------------------------------------|
| Rail | 788 km | 3940 km |
| Sleepers | 659 km | 3295 km |
| Ballast | 744 km | 3721 km |
| Switches & crossings | 359 units (full renewal) 188 units (partial renewal) | 1796 units (full) 940 (partial) |

Scotland

5.37 In reaching a view of track renewals in Scotland, we believe that the same issues and conclusions should be applied to Network Rail's plans as they address the Scottish network. We have therefore made corresponding adjustments which have the effect of reducing Network Rail's proposed expenditure on track renewals from £407m to £395m.

5.38 This equates to 10.2% of the network total. We are satisfied that this is a realistic figure because:

- the previous tendency of the ICM to overstate renewals volumes on rural routes that can be effectively maintained by ongoing component replacement rather than large-scale renewals (of which Scotland has a higher proportion than average) has been corrected; and
- our work in 2005 to calculate the disaggregated proportion of expenditure on the Scottish network showed that it has 10.2% of the total population of switch and crossing units and 13.4% of plain line track km. When weighted to reflect the greater extent of rural and freight railway in Scotland, the latter figure was adjusted to 11.7%. Given the volume of primary route renewals in England & Wales in the next few years, we consider that for Scotland's share to lie below this figure is appropriate for CP4. However, although we expect Scotland's track renewal volumes to stay steady in future, reducing volumes elsewhere will mean that Scotland's percentage share is expected to rise above 10.2% in later control periods.

5.39 Within this expenditure, we have not identified any factors that would lead us to conclude that the mix of track renewal activities in Scotland should be any different from that for the network as a whole. This means that we expect to see Network Rail delivering 10.2% of the volumes shown in the above table.

Civil engineering

Overview

- 5.40 In its SBP, and again in the update, Network Rail put forward a case for pre-efficiency expenditure on civil engineering structures of £2198m during CP4. This compares with a projected CP3 spend, converted to the same efficiency level, of £1630m implying a volume increase of around 35% in CP4.
- 5.41 ACR03 increased funding for civil engineering asset renewals, because we concluded that the previous level of expenditure was inadequate to maintain the condition and capability of the network's engineering structures for the long term. We have not changed that opinion, but in this assessment we have to consider whether there is a case for increasing this activity still further.
- 5.42 The proposed increase is not spread equally across all types of structure. By far the largest element (42%) of the proposed expenditure in CP4 is for repair and renewal of underbridges, in particular to deal with what Network Rail claims to be a continuing decline in the condition of metal bridges. The SBP shows an increase in this expenditure in CP4 which, allowing for increasing efficiency, we estimate to represent a 50% increase in activity volumes.
- 5.43 Of the remainder of the expenditure proposed, overbridges account for 16%, earthworks (cutting slopes and embankments) for 17%, tunnels and major structures for 7% each and the balance for footbridges, retaining walls, drainage culverts and coastal defences. Although Network Rail proposes a significant increase in overall expenditure in CP4, it proposes to spend 19% less on earthworks than in CP3.
- 5.44 Network Rail has essentially continued to apply the policy approach first used to inform our ACR03 conclusions. The basic principles are the same, although there has been some modification to the wording of the two key asset management policies – B and C.
- 5.45 Policy B defines the asset management regime that will “maintain the asset condition and capability by carrying out interventions that achieve the lowest whole life cost without incurring condition led operational restrictions to the railway”. Network Rail proposes to take this approach on all primary, secondary and London & south east routes.
- 5.46 Policy C defines a less onerous regime that will “allow assets to deteriorate until interventions are essential to maintain safety standards or raise performance levels to an acceptable level for continued railway operation. When work is required it should restore an acceptable level of performance and minimise the remaining whole life cost of the asset.” Network Rail proposes to take this approach on rural and freight only routes.

Assessment

- 5.47 The key issue has been to understand the strength of Network Rail's case for a further increase in activity volumes in CP4. We have examined the robustness of the modelling methods used to support the SBP. We have also used performance indicators and site observations to assess the overall effect of the volumes of work carried out during CP3, and hence to judge the extent to which we believe Network Rail has achieved a steady state regime for structures.
- 5.48 Network Rail has undertaken considerable development of its structures modelling tool CECASE (Civil Engineering Cost and Strategy Evaluation) in recent years. This has been extended to model a much greater proportion of the structures portfolio than the previous SACP (Structures Annual Cost Profile) model. It now produces activity forecasts for 80% of all structures, with the remainder (e.g. major structures) being forecast 'bottom-up' based on individual asset management plans.
- 5.49 CECASE forecasts network-wide activity volume by extrapolating from detailed case studies that examine the relative costs of applying different policy options (and therefore various alternative scenarios for the scope and timing of engineering interventions) for the repair and renewal of a sample of structures. Even though CECASE draws on a greater volume of sample data than was available five years ago, our assessment has identified a number of issues about the robustness of the model's predictions. The major issue relates to the robustness of the volume and expenditure requirements generated, given that it still relies on a relatively small sample of structures. Sources of uncertainty include assumptions relating to the position of a structure in its lifecycle, likely interventions, rates of degradation, accuracy of the unit costs, policy assumptions and the accuracy of engineering judgments made by engineers and modellers.
- 5.50 In making its case for a significant increase in expenditure, Network Rail states that the condition of its metal underbridges is still in decline. It seeks to make a network-wide case by reference to a limited number of repeat SCMI (Structures Condition Marking Index) scores of structures at the poor end of the condition spectrum which appear to show significant deterioration over quite a short period, and it applies this evidence to suggest that there is a significant risk of rapid deterioration of an increasing number of structures unless the level of activity is increased substantially. Without that, Network Rail argues that declining asset condition could create significant performance impacts and unmanageable activity volumes beyond CP4.
- 5.51 We have examined Network Rail's case in depth. The operation of any modelling tool that seeks to predict the condition and deterioration of such long life structures is complex. We recognise the progress that Network Rail has made in developing and extending CECASE to provide more robust forecasts, and we would encourage Network Rail to continue to improve and refine it for the future.

- 5.52 At this stage, however, we retain concerns about the statistical accuracy of the outputs from this model. The independent reporter's assessment suggested that the overall tolerance of the model is +/- 15 to 20%.
- 5.53 We continue to be concerned that the model remains poor at predicting the outputs (such as performance impacts, network capability restrictions and future condition scores) that would result from any particular volume of repair and renewal activities.
- 5.54 We are unconvinced by the use of a very small sample of SCMI scores to justify a major increase in expenditure on metal underbridges. We remain concerned that some of the early SCMI scores, upon which Network Rail's case relies to demonstrate a rate of deterioration, were not produced with sufficient accuracy to be reliable. Indeed, in other discussions Network Rail has itself made this very point. We consider that on this basis alone it would not be prudent to justify a major increase in expenditure. Progress in understanding this better has not been helped by the decline in the rate at which Network Rail has been carrying out SCMI scoring in 2007-08.
- 5.55 Several other elements of civil engineering expenditure are modelled in CECASE, and in these cases too we are unconvinced by Network Rail's arguments for increased expenditure. These include:
- overbridges: Network Rail has not made any specific separate case for expenditure on overbridges, relying on the general issues of expenditure on bridges that are discussed above;
 - footbridges: Network Rail has acknowledged that it made an error in double-counting many station footbridges that are also considered as part of the operational property portfolio; and
 - culverts: Network Rail has presented no evidence of any rapid decline in the condition of culverts, and as with bridges we have concluded that a significant increase in funding for repairs is not justified particularly as most culverts are of masonry construction. We also note that repair costs were based on limited data. This decision does not reduce funding for culvert *clearance*, which is included as 'other' expenditure. One TOC was concerned that increased culvert cleaning would increase the risk of collapse, but regularly cleaned culverts will not restrict flow in time of flood and are less likely to suffer damage from floodwater.
- 5.56 We have therefore concluded that although the CECASE model provides informed and useful analysis of future activity volume and expenditure requirements, it does not yet do so with the robustness that we consider necessary for us to be able to treat its outputs with sufficient certainty.
- 5.57 Our view that a major increase in expenditure is not justified is supported by 'on the ground' evidence. We particularly note that:
- the operational performance impact of structures condition (e.g. associated with condition related speed restrictions) has reduced considerably;

- the general condition of the structures we looked at during site visits in Scotland and in south London indicates that Network Rail's structures engineers are succeeding in applying sensible whole life policy interventions equating to policy B as intended when we set CP3 funding; and
- structures in Scotland that have been subject to capability restrictions for a number of years are now being repaired and improved.

5.58 In its response to our draft determinations, Network Rail stated that we have applied a lower policy choice to arrive at a forecast expenditure that is lower than its SBP. That is not the case. We support application of the policies as in Network Rail's Asset Policy document and consider that our determination provides adequate funding for its implementation. However, as we made clear in our draft determinations, we do not accept that CECASE analysis yet gives reliable estimates of the activity and expenditure levels necessary to achieve this. Network Rail has not provided any further evidence to support its CECASE outputs since we published our draft determinations.

5.59 For other categories of structure (e.g. tunnels and major structures), the SBP figures are not derived from CECASE but are forecast individually. We have conducted a number of inspections and audits of these programmes to confirm the proposed cost profiles in the long term.

Conclusions

5.60 For those asset types where the SBP is based on bottom-up assessment (major structures, tunnels, rock cuttings and 'other' items such as culvert clearance and management of old mine shafts) we have, with only minor revisions, accepted Network Rail's proposed levels of expenditure.

5.61 For asset types where the SBP relies on CECASE, we have taken a different approach. We believe the evidence points towards the sufficiency of existing levels of funding, within which Network Rail has been delivering improvements in the overall condition of structures, and we find no case to support a further increase in expenditure beyond the exit level at the end of the current control period.

5.62 We therefore conclude that for CP4, funding to maintain the majority of civil engineering assets (underbridges and overbridges, earthwork structures except rock cuttings, retaining walls, coast and estuary defences and culverts) should be held at the level reached in the final year of CP3. Taking into account that this expenditure has been ramping up over the course of CP3, this will still enable Network Rail to fund a higher total volume of activity than in the current control period. We see no justification for the assertion in its response that there will be increased risk of structures TSRs.

5.63 In making this decision, we are effectively providing Network Rail with more funding for earthwork structure repairs and remedial works to coastal and estuarial defences in CP4 than it sought. Given the sensitivity of these

structures to extreme weather events, we believe that continuation of existing levels of expenditure instead of the reductions that Network Rail proposed is a sensible provision for dealing with the effects of climate change.

- 5.64 The general heading 'other' in the table below includes such diverse items as culvert clearance, investigation of ancient mines liabilities, and costs of closed and mothballed assets.
- 5.65 In its consultation response, Network Rail states that we have reduced funding below 2008/9 levels. This is misleading. For assets where the SBP is based on CECASE, with the sole exception of footbridges where Network Rail has acknowledged an error in its numbers, we made provision for CP4 expenditure based on Network Rail's forecast expenditure for 2008/9. In some cases (earthworks, retaining walls and coastal/estuarial assets) this leads to higher funding in CP4 than shown in the SBP. For the other assets where Network Rail has adopted a bottom up approach, we have accepted its SBP figures. Our figures for pre-efficient CP4 structures expenditure per annum are marginally (3.5%) less than Network Rail's forecast expenditure in 2008/9. In the key area of underbridges our funding provision matches the peak CP3 spend forecast for 2008-09.

Table 5.4: Our conclusions on pre-efficiency structures expenditure

| £m (2006-07 prices) | CP3 actual* GB | CP4 SBP GB | CP4 ORR GB | CP4 ORR England & Wales | CP4 ORR Scotland |
|---------------------------|----------------------|---------------|---------------|-------------------------------|---------------------|
| Underbridges | 638 | 923 | 675 | 573 | 102 |
| Overbridges | 254 | 361 | 283 | 240 | 43 |
| Earthworks | 471 | 383 | 462 | 358 | 104 |
| Major Structures | 147 | 144 | 144 | 49 | 95 |
| Tunnels | 127 | 146 | 146 | 136 | 10 |
| Culverts | 35 | 55 | 37 | 27 | 10 |
| Footbridges | 36 | 48 | 17 | 15 | 2 |
| Retaining walls | 30 | 23 | 30 | 25 | 5 |
| Coast/estuary defences | 28 | 23 | 28 | 25 | 3 |
| Other | 0 | 92 | 73 | 57 | 16 |
| Total | 1,766 | 2,198 | 1,895 | 1,505 | 390 |

* Network Rail's actual expenditure from 2004-08 plus its forecast for 2008-09.

Scotland

- 5.66 In reaching a determination for Scotland we have (except where figures are calculated bottom-up) used the modelled CECASE distribution of expenditure across the network and have applied this to our conclusions on the appropriate total expenditure.
- 5.67 On this basis Scotland's share of CP4 expenditure on civil engineering is 20.6%. In our 2005 analysis of the disaggregated proportion of expenditure on the Scottish network, we calculated the weighted proportion of civil engineering assets in Scotland at 16.9%.
- 5.68 The chief reason for this difference is the major expenditure planned for the Forth and Tay Bridges. Measured by length, Scotland has more than 40% of the network's major structures and both these bridges will be subject to major maintenance and repair programmes in CP4. In later control periods the scale of this expenditure is expected to drop significantly, and it will considerably reduce Scotland's share of the long-run civil engineering expenditure.

Signalling

Overview

- 5.69 Network Rail has proposed pre-efficiency expenditure of £2565m for signalling renewals in CP4, as shown in table 5.5.

Table 5.5: Network Rail's proposals for pre-efficient signalling renewals expenditure in CP4

| Activity | Network Rail's proposals (£m, 2006-07 prices) | % of total |
|--|--|-------------|
| Conventional resignalling (full & partial) | £1,282m | 50% |
| Minor works & life extension | £468m | 18% |
| Level crossing renewals | £220m | 8% |
| ERTMS | £350m | 14% |
| Mechanical locking refurbishment | £50m | 2% |
| Other (safety and central costs) | £195m | 8% |
| Total | £2,565m | 100% |

- 5.70 Just over half of the expenditure is for the planned renewal of 5971 signalling equivalent units (SEUs).²⁹ Most of this is complete renewal of interlockings,

²⁹ An SEU defines a controlled unit of infrastructure, such as a signal or set of points and is a convenient and consistent method of measuring overall renewal volumes.

but it includes some partial equipment renewals. This volume of work is almost identical to the total we expect to have been delivered during CP3, although as table 5.6 shows the CP4 workload is rather more stable than the peaks and troughs that have characterised the current control period.

Table 5.6: Network Rail's proposals for SEU renewals in CP4

| | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total |
|---------------------------|---------|---------|---------|---------|---------|-------|
| Conventional SEU renewals | 1291 | 987 | 1372 | 828 | 1,100 | 5,578 |
| SEU renewals – ERTMS | 0 | 0 | 36 | 0 | 357 | 393 |

- 5.71 ERTMS funding is to cover continuing development costs, trials, initial roll out and train fitment costs. Although the expenditure planned for CP4 is relatively low, the gathering pace of the development programme is a key issue for the control period. The emerging proposals for implementing ERTMS have strongly shaped the scope and timing of the condition-led conventional signalling renewals programme, to the extent that Network Rail has reduced its forecast SEU volumes from almost 9500 in its ISBP. At the same time it has increased the scope of the minor works and life extension programme to provide effective migration towards ERTMS implementation.
- 5.72 Renewals only represent part of the overall signalling workload in CP4 as there will be significant work associated with the enhancement programme. Taking renewals and enhancements together the volume of work in CP4 is estimated to be 9680 SEUs with annual levels between 1600 and 2400 SEUs, peaking in 2011-12. A key issue for CP4 is the deliverability challenge that this poses to Network Rail and its suppliers.

Assessment

- 5.73 Unlike other asset types, forecasting of signalling renewal volumes is not reliant upon statistical modelling. Network Rail's SICA (Signalling Infrastructure Condition Assessment) tool is a well established procedure for assessing the condition and estimating the remaining life of its signalling installations. This means that it is able to generate a future work plan with robust information about the scope, timing and priorities of re-signalling activities based on the condition and performance of individual interlockings.
- 5.74 We reviewed this process in detail during the course of the medium term signalling review³⁰ and we are satisfied that its application in generating signalling renewal volumes for CP4 remains sound. We have also carried out further review of the scope and proposed timing of re-signalling schemes within Network Rail's workbank to confirm that its scope is justified.

³⁰ *Signalling Review: final conclusions of the medium-term review*, Office of Rail Regulation, December 2005. This may be accessed at www.rail-reg.gov.uk/upload/pdf/269.pdf

- 5.75 With ERTMS implementation expected to gather pace, it is important for this review to ensure that the bottom-up generated plans for conventional signalling renewals are consistent with the emerging programme for rolling out new train control technology and equipment. We have reviewed this and are satisfied (a) that the total SEU volumes for conventional renewals broadly reflect a necessary and realistic plan, and (b) that partial renewal volumes and life extension activities reflect sensible proposals to maintain the signalling infrastructure on those routes where ERTMS is due for early completion and hence where full scale conventional renewals would be inappropriate.
- 5.76 We have been monitoring the ERTMS programme as Network Rail, with key stakeholders and the wider industry, has been developing the business case and implementation plans. We are satisfied that the SBP represents a realistic projection of expenditure in CP4.
- 5.77 Network Rail has recently improved its knowledge about the condition of level crossings on the network and how it applies that knowledge to forecast level crossing renewals. Its plans for CP4 represent a doubling of current activity levels to an average of 40 crossings a year.
- 5.78 Minor works and life extension schemes account for almost one fifth of the signalling renewals expenditure proposed by Network Rail. In our conclusion to the medium term signalling review in December 2005, we noted that the minor works workbank was not justified as robustly as the major project work and that there were no clearly defined metrics for costing minor works. We said "we expect Network Rail will have improved the consistency and transparency of its planning processes in time for the long-term review".
- 5.79 We are disappointed that Network Rail has made little further progress in building that transparency. Despite having established a reasonable structure for defining and costing specific activities, the ICM does not provide a breakdown of activities in this category. When we challenged this, Network Rail reviewed the plans in the SBP and reduced its expenditure proposals by approximately £100m in the SBP update. The proposed expenditure is now broadly in line with the level of minor works and life extension expenditure in the final two years of CP3.

Conclusions

- 5.80 On the basis of this assessment we are satisfied that Network Rail has provided substantial justification for the scope of signalling renewal work included in its SBP as updated. The one area where we consider it has failed to justify its plans is for minor works and life extension schemes. However, in reaching our conclusions we have taken into account that we sampled these activities in the 2005 medium term signalling review and established reasonable confidence that the volumes at that time were justified, and that proposals for CP4 are now consistent with the final years of CP3.
- 5.81 We have considered two factors affecting the key issue of deliverability. The first is the scale of the challenge to the resources of Network Rail and its

suppliers posed by the overall signalling renewals and enhancements programmes. We have also noted that Network Rail has consistently under-delivered against its planned volumes during CP3: the CP4 activities include signalling renewals that have been deferred from CP3. Despite such slippage, Network Rail has been able to continue to reduce the number of failure incidents involving signalling equipment.

- 5.82 We consider it likely that Network Rail will need to make further deferrals of signalling renewals during CP4, not least as it implements the lessons learned about avoiding over-extending its resources following recent project overruns.
- 5.83 We have therefore concluded that it is appropriate to provide for a reduction of 5% in signalling renewals expenditure. This adjustment has been made to all elements of expenditure except for the safety component of the 'other expenditure' category (£65m pre-efficiency) and the forecast ERTMS expenditure. This determination funds those plans in full.
- 5.84 This reduction means that we expect the total number of SEUs to be renewed in CP4 to be approximately 5300, with no change to the additional 393 renewed by early implementation of ERTMS.
- 5.85 In its response to our draft determinations, Network Rail argued that if the volumes of full signalling renewal are reduced then the volumes of minor works should be increased to extend the operational life of the assets. This principle is not in question, but in reviewing the merits of Network Rail's case our judgment continues to be influenced by lack of transparency in the breakdown of minor works expenditure. This determination provides a level of funding for minor works and life extension that has been deemed sufficient in the past, with lower levels of renewals than those now projected for CP4, and we are therefore making no change to the figure we previously published.
- 5.86 The outcome of our assessment is summarised in table 5.7.

Table 5.7: Our conclusions on pre-efficiency signalling renewal expenditure for CP4

| £m (2006-07 prices) | Network Rail SBP (April 2008) | ORR determination |
|--|----------------------------------|----------------------|
| Conventional resignalling (full & partial) | 1,282 | 1,217 |
| Minor works & life extension | 468 | 444 |
| Level crossing renewals | 220 | 209 |
| ERTMS | 350 | 350 |
| Mechanical locking refurbishment | 50 | 47 |
| Other (safety and central costs) | 195 | 187 |

| | | |
|--------------|--------------|--------------|
| Total | 2,565 | 2,454 |
|--------------|--------------|--------------|

Scotland

- 5.87 We have assessed signalling renewals expenditure in Scotland during CP4 to be £163m, 6.6% of the network total. Although this is well below the 11.7% of signalling assets that are on the Scottish network, it reflects the nature of the renewals history and age profile of these assets. CP4 is a low point in the profile of renewals in Scotland. In its SBP Network Rail proposed to renew 199 SEUs in Scotland.
- 5.88 In future control periods we expect this balance to change substantially. Our long run calculations show the Scottish element of signalling renewals to rise to a range of 12 – 17% of the network total in CP5 – CP7 before dropping back to lower percentages from CP8.

Telecommunications

Overview

- 5.89 Network Rail proposed pre-efficiency CP4 expenditure of £887m in its SBP. This is less than the £1.02bn that it expects to spend in CP3 because major programmes (replacement of the fixed telecoms network, FTN and development of the mobile communications network GSM-R) are due to be completed during CP4.
- 5.90 The FTN and GSM-R projects account for two-thirds of proposed CP4 expenditure (£594m pre-efficiency). Both projects are well established and have been the subjects of previous efficiency reviews. The remainder of the expenditure is for station information and security systems, driver-only CCTV, cables and cable routes, telephone concentrators and voice recorders.
- 5.91 Network Rail's expenditure on GSM-R includes funding most train cab fitment on behalf of the train operators. We have some concerns that current arrangements make it difficult for Network Rail to optimise cost efficiency.

Assessment

- 5.92 Since the draft determinations, the extent of slippage of the GSM-R programme has become clearer. Some £253m of expenditure, previously expected to take place in CP3 will now fall into CP4. This determination provides for that work to be funded in CP4 and an appropriate adjustment will be made to the RAB to ensure that Network Rail is not funded twice.
- 5.93 Under its franchise agreement, South West Trains has responsibility for funding its cab fitment of GSM-R. As a result, we have deducted £6m from the anticipated final cost of the overall programme.

- 5.94 We have considered the justification for the planned scope of telephone concentrator renewals during CP4. We consider that the commissioning of GSM-R should give the opportunity for reducing the amount of lineside communication equipment such as signal post telephones. While no decisions have been taken on this issue, we believe it is appropriate to make a small adjustment to the proposed expenditure on concentrator renewals.
- 5.95 In its response to our draft determinations, Network Rail accepted that the number of signal post telephones will reduce during CP4. However, it argued that we had not allowed for decommissioning costs, which it estimated at £3m. Although these costs were not specifically identified, we believe that our adjustment adequately reflects the net savings likely to result and we have not made any further change to the figure in the draft determinations.
- 5.96 We have made no other adjustments to Network Rail's proposals.

Conclusions

- 5.97 With the adjustments outlined above, we have assessed pre-efficiency funding for telecom renewals to be £710m plus £253m deferred from CP3. This funds in full Network Rail's plans for completing renewal of the fixed telecoms network and commissioning GSM-R during CP4.
- 5.98 The element of this expenditure in Scotland is £98m plus £34m deferred from CP3, which is 13.8% of the national total. This is above the proportion of telecom assets that we calculated in 2005 (9.3%). However, we are satisfied that this is realistic given that GSM-R will require a greater volume of infrastructure in Scotland than the present telecoms provision (NRN).

Operational property

Overview

- 5.99 In the SBP update Network Rail proposed pre-efficiency expenditure of £1480m for maintenance, repair and renewal of its operational property assets in CP4. Although a reduction from the figure in the SBP, this still represents a substantial increase over the projected CP3 outturn of £1073m. Table 5.8 shows how this is divided across the portfolio; station property accounts for much the largest part (85%).

Table 5.8: Network Rail's proposed pre-efficiency operational property renewals expenditure

| £m (2006-07 prices) | SBP update proposal | % of total |
|--------------------------|---------------------|------------|
| Managed stations | 483 | 33% |
| Franchised stations | 767 | 52% |
| Light maintenance depots | 73 | 5% |
| Lineside buildings | 89 | 6% |

| | | |
|------------------------------|--------------|-------------|
| National distribution depots | 4 | 0.2% |
| Maintenance unit buildings | 64 | 4% |
| Total | 1,480 | 100% |

5.100 Network Rail has improved its asset management processes for operational property during the course of this review, and we have been able to build greater confidence in its expenditure forecasts as the review has progressed.

5.101 One key step has been the publication of an operational property asset policy in October 2007, separating it from previous versions that were incorporated with the civil engineering policies. We regard this as a sensible and positive step. Although civil engineering structures and the fabric of the operational property portfolio share the characteristics of long asset lives and asset management regimes that concentrate heavily upon maintenance and repair rather than full scale renewal, the key drivers of policy for much of the stations portfolio are likely to be very different from the policies that shape the asset management regime for bridges, for example.

5.102 Such a distinction is exemplified by the output requirements for operational property during CP4. Whereas we set no condition targets for any other type of infrastructure asset (although their performance will have to contribute to achieving the regulated requirements for PPM and train delays) we do require Network Rail to meet the target of maintaining steady state condition across the population of franchised stations (see chapter 4).

5.103 Network Rail has consistently said that current expenditure on its operational property assets is insufficient to maintain them in steady state condition. It has argued this strongly for the 2480 franchised stations and has provided evidence to support its case.

Assessment

5.104 Our assessment focused on three particular aspects: the definition and application of its asset management policies, the quality of the asset data that was driving the forecasting of activity volumes and the linkage between the proposed scope of work and the projected outputs.

5.105 The asset policy defines three options for managing operational property:

- Policy A: asset management encompassing the renewal of complete assets which deliver greater functionality and business value;
- Policy B: asset management maintaining current levels of functionality and business value; and
- Policy C: asset management representing the minimum level of intervention to efficiently maintain health and safety and operability in the short-term.

- 5.106 We challenged Network Rail about how it had applied these policies in modelling expenditure. We were concerned that application of policy A to some stations appeared to include expenditure in the renewals programme that would actually fund enhancement.
- 5.107 We were also concerned about the quality of the data used to model the future activity levels in the SBP. Not only did we find that the source data did not represent Network Rail's latest asset condition surveys, but we also concluded that the modelling was making some significant errors in its assumptions about the size of the asset population.
- 5.108 These issues led us to the view that the SBP overstated CP4 expenditure requirements to a considerable degree. However, we believe that Network Rail has taken important steps to address these issues. Its SBP update substantially reduced the overall expenditure plans. The chief changes were:
- to how the asset policy is applied to franchised stations. Policy A is no longer applied to elements (such as roofs) at higher category stations (category A & B) i.e. improved functionality is treated as an enhancement. Policy C has had maintenance activity revised at lower category stations (category E & F), leading to a cost reduction;
 - to improve the quality of modelling by taking into account the latest, and most accurate, station condition survey data collected by Network Rail as part of its ATRIUM database, correcting previous errors in base data. Survey data for some 1900 stations led to substantial revisions to the asset volumes used in the modelling of activity volumes; and hence,
 - to replace the previous approach that built up an expenditure plan based on the application of a simple generic figure for all stations in each category with specific expenditure plans for each station, giving a much improved alignment of expenditure with recorded asset condition.
- 5.109 For the 18 major stations managed directly by Network Rail (the 'managed' stations) the CP4 expenditure plan is dominated by projects at Kings Cross, Paddington, Victoria and Edinburgh Waverley. Three of these are continuations of work that commenced in CP3. Having examined the plans and visited all four sites we are satisfied that the proposed expenditure represents work that needs to be done in CP4, that it is specified appropriately and that the estimated costs lie in a range that we consider to be reasonable.
- 5.110 We have also reviewed the works planned at the other 14 managed stations. These are mainly life cycle replacement of medium size fabric and machinery items, such as lifts and escalators. The cost and timing of these works are considered appropriate.
- 5.111 The unusual scale of expenditure on the managed stations portfolio is the primary reason for the increase in funding in CP4 compared with the current control period.

5.112 There is a more modest 6.5% increase in the level of expenditure planned for the franchised stations. The major part of our independent calculation of the maintenance, repair and renewal expenditure requirements for these stations used survey data from a sample of 213 stations. This was the same data used by Network Rail to re-calculate and improve its own expenditure figures in the SBP update. Because of these improvements, and with the assurance provided by our own calculations, we have accepted Network Rail's proposed expenditure of £767m. We believe this funding enables the portfolio of franchised stations to be managed at steady state condition.

5.113 Planned expenditure on the remainder of the portfolio (light maintenance depots, lineside buildings and maintenance and materials depots) is relatively small in comparison with the figures for stations. We have reviewed the whole life cost principles used to derive the volumes of work.

5.114 One of the most significant changes made by Network Rail in its SBP update adjustments is an increase in expenditure on light maintenance depots. Network Rail has suggested that the reduction in its plans for equivalent activities at franchised stations will free resources to allow the volume of work at these depots to reach its long run steady state level during CP4, instead of the resource-capped plans that were originally put forward in the SBP.

Conclusions

5.115 We endorse the amended expenditure plans put forward by Network Rail in the SBP update, as set out in table 5.9.

Table 5.9: Our conclusions on pre-efficiency operational property renewal expenditure

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | CP4 total |
|--------------------------------------|--------------|--------------|------------|------------|------------|--------------|
| Managed stations | 144 | 132 | 96 | 66 | 44 | 482 |
| Franchised stations | 153 | 153 | 153 | 154 | 154 | 767 |
| Light maintenance depots | 14 | 14 | 15 | 15 | 15 | 73 |
| Lineside buildings | 12 | 16 | 19 | 21 | 21 | 89 |
| National distribution service depots | 0.5 | 0.5 | 1.0 | 1.0 | 1.0 | 4 |
| Maintenance delivery unit buildings | 13 | 13 | 13 | 13 | 13 | 65 |
| Total | 336.5 | 328.5 | 297 | 270 | 248 | 1,480 |

5.116 The table shows that, with two exceptions, operational property maintenance and renewal activities (and hence pre-efficiency expenditure) are expected to be at constant levels throughout CP4. The exceptions are the managed stations, for which the activity plans skew the expenditure profile heavily towards the early years of the control period, and the maintenance and repair of lineside buildings which ramps up as the control period progresses.

5.117 Network Rail made no representations on this element of our draft determinations and we have made no changes.

Scotland

5.118 Our assessment of the operational property expenditure required in Scotland in CP4 is £251m, 17% of the network total.

Table 5.10: Our conclusions on pre-efficiency operational property renewals expenditure in Scotland

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | CP4 total |
|--------------------------------------|-----------|-----------|-----------|-----------|-----------|------------|
| Managed stations | 33 | 45 | 33 | 32 | 6 | 149 |
| Franchised stations | 15 | 16 | 16 | 16 | 16 | 79 |
| Light maintenance depots | 2 | 2 | 2 | 2 | 2 | 10 |
| Lineside buildings | 0.6 | 0.7 | 0.9 | 0.9 | 0.9 | 4 |
| National distribution service depots | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.5 |
| Maintenance delivery unit buildings | 1.5 | 1.5 | 2 | 2 | 2 | 9 |
| Total | 52 | 65 | 54 | 53 | 27 | 251 |

5.119 This share is much higher than the analysis of the disaggregated proportion of expenditure on the Scottish network that we undertook in 2005. Then we calculated that the weighted proportion of station assets by value in Scotland was 10.4% and that for depots it was marginally under 11.0%. However, table 5.10 shows that:

- one factor is responsible for skewing Scotland's expenditure to a much higher percentage. This is the level of spending on the managed stations (particularly Edinburgh Waverley) during CP4. The planned expenditure of £149m accounts for 31% of the total national total; and

- the planned expenditure of £79m on franchised stations represents 10.3% of the national total and is at a level that we would expect for a network where a significant proportion of the stations are the smaller, unstaffed stations in categories E and F.

5.120 After CP4 expenditure on managed stations is expected to reduce significantly, which should return the proportion of Scottish expenditure to more stable long term percentages.

Electrification renewals

Overview

5.121 In its SBP Network Rail set out its plans for work on the core power supply, distribution, contact systems and control infrastructure (SCADA). The expenditure was split quite evenly between the AC overhead and DC third rail systems, with the majority allocated to the renewal of the distribution systems – switchgear, transformers and high voltage cabling. Network Rail also included a programme of ‘campaign change’ renewal of overhead line components to address system reliability and performance issues, but there were no plans for large-scale overhead line renewals. Improved asset condition data led Network Rail to modify its assessment of the remaining life of the overhead line contact system, with the result that major catenary renewals were not expected in CP4.

5.122 The one exception is the need to carry out major renewals of the old overhead line equipment on the Great Eastern main line. This was originally excluded from the SBP renewals figure because it was treated as an enhancement. However it was re-defined as a renewal in the SBP update, giving an increase in proposed renewals expenditure of approximately £100m. Other additional items included in the update were some works deferred from CP3 and the renewal of a power supply point on the West Coast main line in Scotland.

5.123 Network Rail also proposes renewal of older elements of the AC and DC distribution systems, including most of the oil filled switchgear and high voltage cables. Most of these are more than 40 years old, exceeding health and safety guidance on the expected serviceable life of such equipment and likely to pose an increasing performance and safety risk unless replaced. Network Rail proposes:

- to replace approximately 150 high voltage oil filled switchgear units in each year of CP4 on both the DC and AC networks. This should result in virtual elimination of this equipment, leaving only a small population of indoor units to be replaced in later control periods;
- to commence a programme of mid life refurbishment of the newer types of DC switchgear such as vacuum filled and SF6/GIS units;
- to maintain a steady rate of renewal of approximately 180 units of DC low voltage switchgear each year;

- to increase the rate of renewal of high voltage oil filled DC cables in each year of CP4, from the current 20km per annum to almost 60 km in 2013-14;
- to continue with steady state renewal of low voltage DC cables at the rate of 125 km each year; and
- to continue a programme of renewing transformer rectifiers to significantly reduce the age profile of this equipment by the end of CP4.

Table 5.11: Network Rail's proposed pre-efficiency electrification renewals expenditure

| £m (2006-07 prices) | SBP update | % of total |
|---|------------|-------------|
| Overhead line renewals (inc. GE main line) and OLE structures | 182 | 27% |
| AC distribution equipment | 144 | 21% |
| DC conductor rail | 26 | 4% |
| DC distribution equipment | 217 | 32% |
| System control (SCADA) | 55 | 8% |
| Other (deferred CP3 expenditure) | 60 | 8% |
| Total | 684 | 100% |

5.124 The pre-efficiency figure for electrification renewals in the SBP update was £684m (see table 5.11), close to double the total spending in CP3.

Assessment

5.125 We considered there was robust justification for most of the proposed expenditure, and our determination makes only minor adjustments.

5.126 In respect of renewal of overhead line equipment we have reviewed and accepted the case for major renewal on the Great Eastern main line and Network Rail's planned programme of campaign changes. In the latter case, the specification and scope of component renewals is targeted at known reliability and performance problems.

5.127 We consider that there is also justification for the scope of planned renewals of the older elements of the AC and DC distribution systems.

5.128 With regard to the renewal of DC conductor rail, we would have wished to see a much better assessment of CP4 volumes by Network Rail based upon age profile and monitored wear rates. However, total expenditure only amounts to £5m per annum and we have not adjusted this figure in our conclusions.

5.129 We are not convinced of the need for the proposed level of painting overhead line masts. The ICM forecast a build up in the programme rising to almost 5000 masts a year by 2013-14. However, the information provided to support the case (which examined a theoretical life cycle cost for different painting regimes) appears to show a much smaller volume of work is required in CP4. Since Network Rail has not presented a clear and consistent case, nor provided actual condition information, we have decided to make no change to the figure in our draft determinations (a reduction of £10m on Network Rail's proposal). We are also concerned that the proposed level of work could require extensive electrical isolations on key routes such as the West Coast

main line; if this work is considered to be so critical it should at least have commenced in CP3 when there were possessions to accommodate it.

Conclusions

5.130 Other than in two areas we accept Network Rail's plans. We are reducing the provision for painting overhead line masts as described above. The other adjustment, which we have agreed with Network Rail, is to remove £10m provision for upgrading the electrical grid supply point at Elvanfoot on the West Coast main line in Scotland, as this is included in the provision for West Coast Route Modernisation.

5.131 This determination therefore provides for pre-efficiency funding of £664m for the whole network.

Scotland

5.132 Our assessment of electrification expenditure in Scotland is £53m, 8% of the network total.

5.133 This compares with our 2005 analysis of expenditure on the Scottish network, in which we calculated that it included 10.2% of all electrification assets. We are satisfied that the lower CP4 proportion is valid; beyond CP5 our long-run assessment shows expenditure in Scotland to be around 10% of the total.

Plant and machinery

Overview

5.134 This category encompasses a range of fixed and mobile equipment, for which Network Rail proposed pre-efficiency expenditure of £402m as shown in table 5.12. This figure is slightly below the expected CP3 total of £457m.

Table 5.12: Network Rail's proposed pre-efficiency plant & machinery renewals expenditure

| £m (2006-07 prices) | SBP update | % of total |
|---------------------------------|------------|------------|
| Fixed Plant: | | |
| ○ Point heaters | 44 | 11% |
| ○ Signalling supply points | 44 | 11% |
| ○ Signalling power distribution | 34 | 8% |
| ○ Other | 50 | 12% |
| Depot plant | 46 | 12% |
| National Delivery Service fleet | 35 | 9% |
| Maintenance fleet | 5 | 1% |
| High output plant | 111 | 28% |

| | | |
|----------------------------|------------|-------------|
| Intelligent infrastructure | 33 | 8% |
| Total | 402 | 100% |

Assessment

5.135 Expenditure on plant and machinery is a key enabler for Network Rail to continue to improve important aspects of its performance. We note that the largest element is further funding of high output machinery for maintenance and renewal of the network, supported by investment in the fleet for delivery of engineering materials. We consider these to be important items of expenditure that will further improve the efficiency with which Network Rail carries out engineering work.

5.136 Most of the other items of expenditure – especially on fixed plant (42% of the total) and intelligent infrastructure equipment for remote monitoring of assets – should provide further opportunities to improve the performance of the network and the effectiveness and efficiency of infrastructure maintenance.

Conclusions

5.137 In our draft determinations we made one minor adjustment to Network Rail's expenditure plans. This £8m reduction in the figure for fixed plant effectively removed a sharp increase in expenditure proposed in 2013-14. Network Rail has drawn our attention to more information that supports the inclusion of this sum in our determination, and we have accepted this. We now fully endorse Network Rail's planned expenditure on fixed plant and machinery.

Scotland

5.138 This determination gives a total expenditure on plant and machinery in Scotland of £38m, marginally below 10% of the network total.

Other renewals

Overview

5.139 This includes a diverse range of expenditure, much of it intended to deliver improvements in business performance and/or efficiency. The SBP update proposes pre-efficiency expenditure of £731m for the whole network.

Table 5.13: Network Rail's proposed pre-efficiency expenditure on other renewals

| £m (2006-07 prices) | SBP update | % of total |
|-----------------------------------|------------|------------|
| Information management (IM) | 475 | 65% |
| Corporate offices | 90 | 12% |
| Committed 'discretionary' schemes | 74 | 10% |

| | | |
|-----------------------|------------|-------------|
| Unallocated overheads | 92 | 13% |
| Total | 731 | 100% |

Assessment – IM

- 5.140 In our draft determinations we concluded that Network Rail had not supported its proposals with robust business cases. We proposed a substantial reduction in funding to £337m.
- 5.141 Network Rail has since provided additional supporting information in a number of areas. We have revised our conclusions to include £95m of spend on work we previously suggested should be funded by the investment framework as it was particularly uncertain; Network Rail has now convinced us that this work will go ahead. We have also corrected our analysis by including an additional £3m in connection with a telecoms infrastructure project.
- 5.142 Responding to our draft determinations, Network Rail supported its proposals for higher expenditure noting that IM spending by UK utilities is expected to rise by 5.9% pa between 2006 and 2011, and that utilities spend on average 2.1% of turnover on IM.
- 5.143 We do not regard these arguments as persuasive. Network Rail has not been increasing its own IM spend in CP3; this rose by just £1m between 2005-06 and 2007-08 and peaked in 2006-07. It is underspending by 18% compared with the CP3 funding provision (largely unchanged from its ACR03 submission). In each of the first four years of CP3 Network Rail underspent against its own budget (by an average of 20.4%) and at period 6 this year it is underspending by 19.6%. So far in CP3, Network Rail has only spent 1.6% of turnover on IM; in no year did it have been above 1.8%.
- 5.144 Whether or not Network Rail has a tendency to overestimate project costs or to be unrealistic in forecasting how quickly work can be done, it seems likely that this would also be the case to some degree in its SBP submission – not least since few of the proposed projects are yet well-defined or supported by detailed calculations of benefits and costs. Network Rail agrees that these projects should be regarded as a package and that it is unlikely that it would be implemented without further changes to its contents.
- 5.145 Our own analysis of the supporting documents confirms that it is likely that Network Rail have overestimated the cost of these projects. On this basis we have reduced Network Rail's CP4 figures by £41m. Overall, our provision is at the same level (pre-efficiency) as Network Rail's CP3 expenditure³¹

³¹ This assumes £92m of IM expenditure in 2008-09, which is Network Rail's budget adjusted by the average CP3 underspend.

Assessment – corporate accommodation

- 5.146 Our draft determinations excluded the costs for investment in a national centre project that was uncertain and we suggested funding it through the investment framework if it proceeded. Network Rail has since persuaded us that there is sufficient certainty for this scheme to be funded through this review.
- 5.147 However it has updated its forecast of corporate accommodation costs to be £27m higher than in the SBP. The revised forecast includes £58m on the national centre project. We are not convinced that the provision should be higher than proposed in the SBP, particularly given conditions in the building industry. The SBP figure (£90m) is higher than actual CP3 expenditure (£82m at 2006-07 prices) and includes some £50m for material one-off projects.

Assessment – ‘committed discretionary schemes’

- 5.148 This element consists of planned expenditure to progress Network Rail's modular switch and crossing programme and to develop a fleet engineering centre. During this review Network Rail abandoned its original proposals for the fleet engineering centre. We have therefore reduced the figure in our determination by £17m. We have increased the figure to recognise slippage of expenditure on West Coast related projects from CP3 into CP4.

Assessment – unallocated overheads

- 5.149 We previously noted that Network Rail had not demonstrated that the transfer of £92m overhead and project engineering costs out of operational expenditure in the SBP update was consistent with the unit cost assumptions made for renewal and enhancement costs. Network Rail has now provided a partial reconciliation of the unallocated overheads in renewals and enhancements. It said that the unit rates were £125m lower than they should be as they omitted pension costs. Subsequently Network Rail said that its proposed adjustment for pension and some other costs should be £134m.
- 5.150 We have reviewed this analysis, and have concluded that £95m (pre-efficiency) of track and signalling overheads should be included in renewals.

Allocation/attribution of costs to Scotland

- 5.151 For IM renewals, Network Rail's allocation of costs to Scotland is reasonable and for this determination we intend to adopt the company's allocation of 9.459% of expenditure to Scotland. This allocation is derived from the regulatory accounting guidelines.
- 5.152 For corporate accommodation renewals, Network Rail has allocated expenditure between Scotland and England & Wales using the general allocation of 9.703% of other renewals expenditure derived from the regulatory accounting guidelines. However, as the majority of projects Network Rail is planning are in England & Wales we have revised the

allocation and based it on Network Rail's proposed projects. This gives an overall allocation of corporate accommodation renewals to Scotland of 5.46%.

5.153 For unallocated overheads, Network Rail also allocates 9.703% to Scotland using the same 'other renewals' factor. We think this is inappropriate as it is more consistent in this determination to allocate these overheads based on renewal expenditure in CP4. This gives an allocation to Scotland of 12.0%.

Conclusions

5.154 Our conclusions are shown in table 5.14. We are confident that they provide Network Rail with reasonable funding given the uncertainty still surrounding its plans, and since projects excluded from our assessment can, if necessary, be dealt with through the investment framework or the logging-up mechanism.

Table 5.14: Our conclusions on pre-efficiency expenditure on other renewals

| £m (2006-07 prices) | Our conclusion | % of total |
|---------------------------------|------------------|-------------|
| Information management | 434 | 62% |
| Corporate offices | 90 | 13% |
| Committed discretionary schemes | 84 ³² | 12% |
| Other miscellaneous schemes | 95 | 13% |
| Total | 703 | 100% |

Maintenance

Overview

5.155 Network Rail proposed pre-efficiency expenditure of £5311m on infrastructure maintenance in CP4. This is below the forecast total of £5859m in CP3. Table 5.15 shows a breakdown of this figure based on the ICM.

Table 5.15: Network Rail's proposed pre-efficiency expenditure on maintenance

| £m (2006-07 prices) | SBP update | % of total |
|-------------------------|------------|------------|
| Core maintenance | | |
| Track | 2164 | 41% |
| Signalling | 647 | 12% |
| Electrification | 179 | 3% |
| Telecoms | 316 | 6% |
| Plant & Machinery | 77 | 1% |

³² Includes £27m deferred from CP3 relating to West Coast efficient engineering access project and West Coast electrification & plant schemes

| | | |
|-----------------------------------|--------------|-------------|
| Core maintenance sub-total | 3,383 | 64% |
| Indirect costs | 945 | 18% |
| Other costs | 983 | 19% |
| Total | 5,311 | 100% |

5.156 The ICM has made good progress in providing a breakdown of maintenance expenditure to route segments. Almost two-thirds of costs are for 'core' maintenance activities. In each asset category we have been able to examine a detailed breakdown showing individual activity volumes profiled annually through CP4. For example, track maintenance costs can be modelled to reflect reducing requirements for interventions as track is renewed.

5.157 The remaining one third of expenditure is classed as indirect and other costs. These have been spread across route segments, in contrast with the build up of activity-based direct costs. They comprise indirect accommodation and staffing costs, utility supply costs, engineering train haulage and £40m per annum for inspection of civil engineering structures.

5.158 This 'other' expenditure also includes additional costs associated with the revised access regime on the West Coast main line (£35m pa) and for maintenance of new routes in Scotland (£18m in total for CP4).

Assessment

5.159 Although the ICM provides visibility of maintenance activity levels by route segment, it remains more difficult to assess and evaluate the justification for maintenance volumes (many of which are essentially reactive) than for renewal volumes generated by modelling of asset age, service lives etc. Furthermore Network Rail has developed significant efficiency proposals for maintenance expenditure, many of which are based on expected changes in activity volumes as it improves productivity during CP4. In general therefore we are not making an explicit assessment of maintenance activity volumes.

5.160 However we are making one adjustment to the SBP proposals. The Airdrie to Bathgate project will open a section of new railway and provision is needed for the associated maintenance costs. Network Rail proposed an amount of £10.9m (CP4 total pre-efficiency). Taking into account that maintenance costs should be below the network average on this new route, Transport Scotland consider this excessive. We agree and we are reducing this figure to £6.2m.

5.161 Our draft determinations took no account of costs associated with Network Rail's intention to harmonise the terms and conditions of its maintenance employees. We understand that it has around 75 different sets of terms and conditions, largely as an inheritance from bringing these employees in-house in 2003. In its SBP Network Rail identified the issue but did not include a cost forecast as details were still being negotiated and the outcome was uncertain.

5.162 The rationale for additional expenditure is not only to achieve harmonisation. As the network becomes busier, access for scheduled maintenance will reduce and more of this activity is expected to move to nights and weekends. The detail of employee terms and conditions is a matter for the company and its employees, however we acknowledge the general merits of moving to common terms and conditions and ensuring that these reflect the changing work patterns needed. We would expect this to enable greater and faster efficiency improvement than the company assumed in its SBP update.

Conclusions

5.163 For the reasons above we are not, in general, making explicit assessment of scope changes to the maintenance activity in Network Rail's proposal. Our assessment of the potential for efficiency improvements in maintenance will cover both 'unit cost' and 'scope' efficiencies under this heading.

5.164 This determination therefore provides for pre-efficiency maintenance funding in full as in table 5.15, subject to deduction of £5m in respect of Airdrie-Bathgate and provision for harmonisation, giving £5,430m for GB as a whole.

5.165 Note that incremental funding for enhancements will, in some cases, include elements of additional maintenance costs not included in these figures. This is set out in chapter 9.

Scotland

5.166 After adjusting the sum for Airdrie-Bathgate, and making £12m provision for harmonisation of terms and conditions, we conclude that provision for maintenance expenditure in Scotland should be £532m, which is 9.8% of the network total. The breakdown of this expenditure is shown in table 5.16.

Table 5.16: Our conclusions on pre-efficiency expenditure on maintenance in Scotland

| £m (2006-07 prices) | ORR assessment | % of total |
|-----------------------------------|----------------|------------|
| Core maintenance | | |
| Track | 211 | 40% |
| Signalling | 60 | 11% |
| Electrification | 26 | 5% |
| Telecoms | 35 | 7% |
| Plant & Machinery | 7 | 1% |
| Core maintenance sub-total | 339 | |

| | | |
|-----------------------------|------------|-------------|
| Indirect costs | 91 | 17% |
| Other costs | 89 | 17% |
| Allowance for harmonisation | 12 | 2% |
| Total | 532 | 100% |

Summary

5.167 Tables 5.17 and 5.18 summarise our assessment of the pre-efficiency expenditure Network Rail will need to make on renewals and maintenance in CP4 and compare this with Network Rail's proposals in the SBP update.

Table 5.17: Total renewals and maintenance expenditure in CP4 (GB)

| £m (2006-07 prices) | Network Rail SBP update | ORR assessment |
|--------------------------|-------------------------|----------------|
| Renewals | | |
| Track | 3,992 | 3,869 |
| Signalling | 2,565 | 2,454 |
| Civil engineering | 2,198 | 1,895 |
| Operational property | 1,480 | 1,480 |
| Electrification | 684 | 673* |
| Telecoms | 887 | 963* |
| Plant & machinery | 402 | 418* |
| Information management | 475 | 434 |
| Corporate offices | 90 | 90 |
| Discretionary investment | 74 | 84 |
| Unallocated overheads | 92 | 95 |
| Total renewals | 12,938 | 12,456 |
| Maintenance | 5,311 | 5,430 |
| Total M&R | 18,249 | 17,886 |

* Includes deferral from CP3: £9m electrification, £253m telecoms, £16m plant & machinery.

Table 5.18: Scotland renewals and maintenance expenditure in CP4

| £m (2006-07 prices) | Network Rail SBP update | ORR assessment |
|--------------------------|----------------------------|----------------|
| Renewals | | |
| Track renewals | 408 | 395 |
| Signalling renewals | 170 | 163 |
| Civil engineering | 433 | 390 |
| Operational property | 251 | 251 |
| Electrification renewals | 64 | 53 |
| Telecoms | 114 | 132* |
| Plant & machinery | 39 | 40* |
| Information management | 45 | 41 |
| Corporate offices | 9 | 5 |
| Discretionary investment | 7 | 6 |
| Unallocated overheads | 9 | 11 |
| Total renewals | 1,549 | 1,488 |
| Maintenance | 525 | 532 |
| Total M&R | 2,074 | 2,020 |

* Includes deferrals from CP3: £34m telecoms, £1m plant & machinery.

Long run renewals expenditure

5.168 We have assessed the (pre-efficiency) renewals expenditure required over 35 years starting with CP4 to maintain the network on a sustainable basis. This is necessary because the long life of rail assets means that the level of renewals in a single control period can be unrepresentative of the long-run average, which is the basis for our amortisation provisions. Our assessment is based on Network Rail's long-run projections. Where we have departed from the SBP update in our conclusions for CP4 we have, as appropriate, made corresponding adjustments to the long-run figures.

5.169 Tables 5.19 and 5.20 compare our assessments of long run average expenditure and the annual expenditure needed in CP4.

Table 5.19: Our assessment of CP4 and long-run renewals (network total)

| £m (2006-07 prices) | CP4 average | 35 year average | Comments |
|----------------------|--------------|-----------------|--|
| Track | 773 | 607 | Age profile driving increased renewals in CP3 and CP4 |
| Signalling | 491 | 495 | |
| Civil engineering | 379 | 359 | High major structures spend in CP4; end of Bridgeguard 3 programme |
| Operational property | 296 | 257 | Major station roof renewal in CP4 at four sites |
| Electrification | 135 | 72 | GE mainline renewal included in CP4 |
| Telecoms | 193 | 105 | GSM-R/FTN concluded in CP4 |
| Plant and machinery | 84 | 78 | |
| Other renewals | 141 | 87 | CP4 includes additional expenditure to improve efficiency |
| Total | 2,491 | 2,061 | |

Table 5.20: Our assessment of CP4 and long-run renewals (Scotland)

| £m (2006-07 prices) | CP4 average | 35 year average | Comments |
|----------------------|-------------|-----------------|---|
| Track | 79 | 72 | |
| Signalling | 33 | 49 | CP4 renewals lower than average due to age profile of equipment |
| Civil engineering | 78 | 63 | High major structures expenditure in CP4 |
| Operational property | 50 | 29 | Roof renewal at Edinburgh Waverley in CP4 |
| Electrification | 11 | 6 | |
| Telecoms | 26 | 16 | GSM-R/FTN concluded in CP4 |
| Plant and machinery | 8 | 8 | |
| Other renewals | 13 | 5 | CP4 includes additional expenditure to improve efficiency |
| Total | 298 | 249 | |

6. Operating expenditure

Introduction

- 6.1 This chapter summarises our assessment of Network Rail's pre-efficiency CP4 operating expenditure (opex) projections.

Background

- 6.2 Network Rail's SBP forecasts total opex of £5.6bn in CP4. This is divided into two categories: controllable opex such as operations costs (e.g. signallers), insurance, pensions, human resources and finance; and non-controllable opex such as traction electricity, cumulo rates and British Transport Police, which the company has limited ability to control. Network Rail forecasts controllable opex in CP4 of £3.8bn and total non-controllable opex of £1.8bn.
- 6.3 Opex is an important part of Network Rail's overall revenue requirement, with Network Rail projecting it to be some 17% of its total operating, maintenance, renewals and enhancement expenditure in CP4, and 19% of its projected gross revenue requirement.
- 6.4 Throughout PR08 we have engaged extensively with Network Rail to understand and challenge its opex forecasts. It is difficult to assess opex activity volumes, therefore the principal focus of our review of opex has been on the opportunities to improve overall efficiency. Our assessment of the scope for opex efficiency improvement is covered in chapters 7 and 8.
- 6.5 Our initial approach to the PR08 opex assessment was, in line with other expenditure categories, to put the onus on Network Rail to produce a robust and fully justified plan for our review. At the start of PR08, in the expectation that Network Rail would deliver a robust and justified plan, we only planned to supplement this with our own top down benchmarking of opex efficiency.
- 6.6 However, in our advice to ministers in February 2007 we explained that Network Rail had included little detailed analysis or justification for its CP4 opex forecasts in its initial SBP. In our guidance on the form and content of its SBP we asked Network Rail to improve the robustness of its opex forecasts for CP4.

Assessment of the SBP

- 6.7 Network Rail did provide some improved analysis to support its SBP, however we did not consider that this provided us with an adequate basis for our review.
- 6.8 Network Rail's general approach to forecasting its opex for CP4 has been to apply its efficiency assumptions to its 2007-08 budgeted opex costs. In some

areas, such as insurance and pensions, Network Rail has provided specific forecasts. We carefully reviewed the company's SBP forecasts and consider that it has the following shortcomings:

- generally, Network Rail explained to us what it is planning to do in 2007-08 but it has not justified why it needs the amount of resource it has included in the SBP to carry out activities efficiently in CP4;
- Network Rail has not adequately explained the difference between the opex projections included in the SBP and the ISBP and it has not adequately explained the variances between the 2007-08 budget included in the SBP and actual expenditure in 2006-07;
- Network Rail has not adequately explained how the costs in 2006-07 compare to the rest of CP3, i.e. where and how it has achieved the CP3 efficiency savings;
- the total amount of costs (excluding employment costs) that Network Rail benchmarked was approximately 10% of opex and Network Rail also did not adequately explain why it did not benchmark other costs which could be comparable, such as commercial property (£41m per annum), managed stations (£28m per annum), other HR costs such as training (£13m per annum) and procurement (£6m per annum);
- there are material parts of operating costs that Network Rail did not provide any support for in its SBP, e.g. chief engineer (£36m per annum), other HR costs like training (£13m per annum) and commercial property (£41m per annum);
- it is only very recently that Network Rail has provided an analysis of the overhead and project engineering costs transferred out of opex into renewals and enhancements in the SBP, to show whether they are consistent with the overhead and project engineering assumptions in the renewals and enhancement unit costs used for the SBP. This issue has been discussed in chapter 5 and is an example of Network Rail's inadequate approach to providing supporting information to some of its expenditure projections and demonstrates a lack of transparency; and
- Network Rail has not provided a full justification for the efficiency assumptions it has applied to opex.

6.9 Our initial review of the SBP highlighted the shortcomings in Network Rail's work. We therefore engaged consultants to support us in our further assessment of opex, specifically in the area of efficiency. Consequently, we did not ask Network Rail to do any specific further work for its SBP update. In the SBP update there are only very minor changes in the company's overall forecasts.

6.10 The purpose of the consultancy work we undertook was to look at specific, important areas of Network Rail's opex that the company had not adequately covered in its own work. This work, relating to the scope for opex efficiency improvements, is set out in chapter 7, and our assumptions on controllable opex for CP4 are set out in chapter 12.

Response to our draft determinations

6.11 The main response on opex was from Network Rail. Its comments on the pensions, other operating income, BT police, insurance, employment costs, operations and customer services, and the CP4 starting position are discussed below or in chapters 7 and 8. The other main comment Network Rail made was that its benchmarking studies on finance and HR costs have shown that there is limited opportunity for further cost savings.

Controllable opex

6.12 Network Rail's claim that its opex benchmarking has shown limited opportunity for further cost savings in its finance and HR functions is not convincing. It relied on a relatively simple approach that looked at activities that it thought were comparable and assumed the costs were on the same basis, i.e. that there were no differences in the definition of the activities or the accounting of the costs. As mentioned above, other activities, such as training, were excluded from the analysis. One example of this approach is that Network Rail benchmarked £13m of HR costs but actual HR costs are substantially higher, the other aspects of HR such as training costs (£13m per annum) were not included or explained by Network Rail.

The 2009-10 starting point

6.13 In Network Rail's response, it said that it is finding it harder to achieve opex (and maintenance) savings in 2008-09 than it previously projected in the SBP and SBP update and considers that the opening position for CP4 should be adjusted. Whilst the company has recently presented us with an updated combined opex and maintenance projection for 2008-09,³³ in terms of opex we are not generally convinced by this argument and do not accept that we should make an adjustment to the opening position for CP4 except to correct an error in our draft determinations to ensure that pensions costs at the starting position are on the same basis as pensions costs in the SBP Chapter 8 discusses this issue further.

6.14 In its response to the draft determinations, Network Rail also proposed a reallocation of costs between opex and maintenance. We have reviewed these suggestions but have not included the changes in this document to ensure consistency with the SBP and earlier documents. We will review this issue further as part of the next update of the regulatory accounting guidelines for 2009-10.

Treatment of pensions

6.15 In our September 2007 financial issues consultation we said that given the difference in Network Rail's pension arrangements and liabilities compared with other comparable companies, there is less of a need for us to have a

³³ It was unhelpful that the analysis was not disaggregated between opex and maintenance.

specific set of policies for the treatment of pension costs.³⁴ Therefore, instead of using a specific approach to the treatment of pensions, we decided to treat pensions in the same way as any other operating cost. All respondents to the September 2007 financial issues letter supported this approach but Network Rail has argued that we should take account of the position it inherited, and the company's response to our draft determinations said that we should take account of its view that pensions costs may be rising.

- 6.16 We do not consider that the issues raised by Network Rail are relevant given that we need to consider the efficiency of overall employment costs instead of just one aspect of them. Our general approach to opex is to roll forward the 2008-09 starting point by a general efficiency assumption. Therefore, the implicit pensions assumption contained in our determination is not based on the benchmarked total employment costs from Inbucon's study (explained further in chapter 7) but Network Rail's cash pensions cost in 2008-09 (which include deficit costs) rolled forward by our general opex efficiency assumption. Given the conclusions of the Inbucon report this is generous to Network Rail.

Non-controllable opex

- 6.17 We have set out the treatment of non-controllable opex in previous PR08 documents, in particular our letter on the treatment of risk and uncertainty and our February 2007 advice to ministers.³⁵
- 6.18 Although we define these costs as being 'non-controllable', in practice Network Rail has control over some aspects of these costs. Therefore, we need to ensure the right incentives are in place for Network Rail to manage these costs efficiently. In our September 2006 consultation letter we said that it may not be appropriate for Network Rail to bear the risks where the uncertainty surrounding the level of these costs is material. The consultation suggested different ways of dealing with the risks associated with these costs:
- assuming an ex ante level and then, recognising that there is upside as well as downside risk to Network Rail, leave the risk with the company;
 - using an automatic pass-through of the costs to Network Rail's customers and funders; or
 - assuming an ex ante forecast in CP4's allowed revenue and log up/down any variations from this level for consideration at the next periodic review.

³⁴ *Financial issues update and further consultation*, Office of Rail Regulation, September 2007. This may be accessed at www.rail-reg.gov.uk/upload/pdf/pr08-financial-issues-let-060907.pdf.

³⁵ *Periodic Review 2008 (PR08): The treatment of risk and uncertainty*, Office of Rail Regulation, 28 September 2006. This may be accessed at www.rail-reg.gov.uk/upload/pdf/pr08-risk-let-280906.pdf.
Periodic review 2008: Advice to Ministers and framework for setting access charges, Office of Rail Regulation, February 2007. This may be accessed at www.rail-reg.gov.uk/upload/pdf/316.pdf.

- 6.19 In ACR03 the first approach was adopted where we made an assumption of the level of these costs and Network Rail bears the impact of higher or lower levels (within the limits imposed by the general re-opener provisions). This applies for all the non-controllable costs apart from traction electricity where a combination of pass through and an ex ante allowance is used. Most respondents to the September 2006 consultation letter favoured the third approach.
- 6.20 The approach we are using to deal with these costs in CP4 is to use a combination of the options outlined above, depending on how controllable the cost is. This is a more targeted approach than we used in ACR03.
- 6.21 For British Transport Police (BTP) costs, we set out in our advice to ministers in February 2007 and confirmed in our draft determinations, that we would provide an ex ante allowance with the risk of the outturn being different taken by Network Rail. We reduced Network Rail's forecast to reflect that it had just rolled forward the budget for these costs without applying an efficiency assumption or providing evidence that it was reasonable to roll them forward at the same level as 2008-09, given that historic BTP costs were lower than the 2008-09 level. Also EWS had said that it did not consider that Network Rail was doing enough to challenge these costs or exploring options for cheaper security provision.
- 6.22 Network Rail has recently written to us and said that its SBP update forecast of BTP costs was wrong by £9m. We have increased our allowance for BTP costs by £4m to £57m. This is similar to Network Rail's forecast average spend in CP3 of £58m, higher than rolling forward Network Rail's forecast outturn for 2008-09 but applying the opex efficiency assumption (£56m) and higher than the SBP update (£56m).
- 6.23 Cumulo rates are controllable when Network Rail is negotiating the valuation of the network with the Valuation Office Agency. The valuation of Network Rail's network will be completed in 2009, too late for this determination. Therefore, we have assumed an ex ante forecast in Network Rail's CP4 allowed revenue and will log up/down variations from this level for consideration at the next periodic review. The main issue that will determine how we treat any variations from the ex ante forecast will be whether Network Rail has handled its negotiations efficiently. Network Rail did not revise its assumption for cumulo rates in the SBP update. Following further discussion with Network Rail we have left our assumption unchanged.
- 6.24 As we have said in previous documents, our fee³⁶ will be passed through (logged up). Our estimate of Network Rail's share of these costs is £16m per annum (in 2006-07 prices). We have set an ex ante allowance for the Rail Safety and Standards Board levy, with Network Rail taking the risk of the outturn costs being different. Our estimate of this cost is £8m per annum (in 2006-07 prices).

³⁶ Our fee includes both the economic licence fee and safety levy.

6.25 Network Rail is protected against changes in traction electricity costs, since the costs are recovered from train operators through the traction electricity charging arrangements. For franchised passenger train operators this protection is provided through the new traction electricity charge arrangements (explained in chapter 19), agreed between the operators and Network Rail, (effective from 1 April 2007). Freight operators are not currently part of these arrangements but may join them during CP4. In the meantime, for their electrified services they continue to pay on the basis of changes in the MLUI index (see chapter 19) which is a lagged index so there is an element of cashflow risk for Network Rail if the index differs from its actual costs. We do not consider that this is a significant issue for Network Rail given the small share of traction electricity that is consumed by freight operators. A wash-up adjustment is made to the final traction electricity charges, where actual costs to Network Rail differ from expected cost (with freight operators joining the wash-up in CP4).

6.26 Our assumptions on 'non-controllable' costs are summarised in table 6.1.

Table 6.1: Our assumptions on CP4 non-controllable opex (Great Britain)

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total CP4 |
|------------------------------------|------------|------------|------------|------------|------------|--------------|
| BT police | 57 | 57 | 57 | 57 | 57 | 283 |
| Cumulo rates | 69 | 87 | 91 | 91 | 91 | 429 |
| Traction electricity (EC4T) | 179 | 182 | 188 | 196 | 201 | 946 |
| Railway safety charge | 8 | 8 | 8 | 8 | 8 | 40 |
| ORR fee | 16 | 16 | 16 | 16 | 16 | 80 |
| Other | 0 | 0 | 0 | 0 | 0 | 2 |
| Total non-controllable opex | 329 | 350 | 360 | 368 | 373 | 1,780 |

6.27 Overall our allowance for non-controllable opex of £1,780m is £16m lower than Network Rail's forecast of £1,796m in the SBP update.

Allocation/attribution of costs to Scotland

6.28 The amount of costs directly attributed to Scotland has fallen since the work to support devolving responsibility for rail strategy and funding in Scotland to Scottish Ministers,³⁷ due to the effects of restructuring. Both Network Rail and ourselves have independently done sensitivity analysis on the costs that are allocated and the results are not sensitive to changes in the metrics used. We

³⁷ *ORR's approach to regulation in Scotland: Conclusions*, Office of Rail Regulation, December 2005. <http://www.rail-reg.gov.uk/upload/pdf/267.pdf>.

consider that Network Rail's allocation of costs to Scotland is reasonable and therefore we intend to adopt the company's allocations for CP4.

Other operating income

- 6.29 Network Rail's opex forecast is presented net of other operating income, which is income that Network Rail receives from third parties, such as some property income and the sale of scrap metal. In its SBP Network Rail's forecast of other operating income in 2008-09 was £90m (in 2006-07 prices).³⁸
- 6.30 In its SBP, Network Rail reduced this income by applying its view of efficiency (without applying its adjustment for real input price increases), on the assumption that the capacity to earn this income would reduce proportionately. In its SBP, Network Rail projects an average level of operating income of £79m per annum. We do not consider that these assumptions are reliable; we do not accept that all of the other operating income streams should be reduced by an efficiency assumption. For example, hire of IT systems and sales of scrap metal are not correlated with Network Rail's efficiency but are related to other economic factors.
- 6.31 In its consultation response, Network Rail has effectively agreed that some aspects of this income should not be reduced by the net efficiency assumption but has not restated its projection.
- 6.32 We continue to consider that in the round it would be more appropriate to assume that this income would not materially change from the current levels. Using this assumption would reduce controllable opex by £57m over CP4 when compared to Network Rail's forecast. However, as we are applying a top-down efficiency assumption to controllable opex we have not separately adjusted for this potential difference.

Summary of our determination

- 6.33 In order to determine Network Rail's pre-efficient controllable opex we took its SBP forecast for 2008-09 and adjusted it by:
- deducting business interruption insurance costs that have been provided for elsewhere in our determination as discussed in chapter 7; and
 - adjusting pensions costs so that they are on a cash basis, which is consistent with the rest of our determination and the SBP in CP4.
- 6.34 Table 6.2 summarises how we derived our pre-efficiency determination for CP4 for controllable opex. This is the pre-efficient level for each year of CP4.

³⁸ Actual other operating income in 2007-8 was £98m.

Table 6.2: Calculation of pre-efficient controllable opex for CP4

| £m (2006-07 prices) | Pre-efficient controllable opex |
|--------------------------|---------------------------------|
| Network Rail SBP | 784 |
| <i>Less</i> | |
| Business interruption | 26 |
| Pensions | 15 |
| Our determination | 743 |

7. Efficiency assessment

Introduction

- 7.1 This chapter sets our assessment of Network Rail's efficiency proposals and explains the work we have done to determine the potential scope for efficiency improvement in OM&R. Our use of this evidence and our judgements on efficiency for CP4 are set out in chapter 8.
- 7.2 The chapter is structured as follows:
- context for the efficiency work is provided;
 - Network Rail's improvement in efficiency in CP3 is summarised;
 - Network Rail's proposals for CP4 are summarised;
 - our assessment of Network Rail's proposals is set out; and
 - our own work to assess the scope for efficiency improvement is explained and Network Rail's response to this work is summarised and discussed.
- 7.3 Network Rail has challenged our draft determinations on efficiency. It has provided a significant volume of supporting material to back-up its response. Most of its response relates to the work we have done to assess the scope for efficiency improvement, which is discussed in this chapter. Other parts relate to the application of the evidence from this work to establish our assumptions on the level and profile of CP4 efficiency improvement. Network Rail's responses on these issues are discussed in chapter 8.
- 7.4 Other stakeholders have also commented on efficiency, though mostly in terms of the actual judgements we have made on efficiency for CP4 rather than the assessment of the efficiency gap. Both the Railway Industry Association (RIA) and EWS provided detailed responses on the scope for efficiency improvement.
- 7.5 We have reviewed Network Rail's response and the responses made by other stakeholders very carefully. We have made some specific adjustments to our efficiency assumptions for CP4 (which are set out in chapter 8). Our advisers have reviewed and responded to Network Rail's critique of their work. We have also tested key assumptions further to ensure the credibility and robustness of our analysis.

Context

- 7.6 Our determinations for CP4 must provide 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. 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.

- 7.7 We have assessed the scope for efficiency improvement across Network Rail's controllable operating, maintenance, renewals and enhancements expenditure. The work we have done to assess the scope for efficiency improvements in enhancements expenditure is set out in chapter 9, with this chapter covering efficiency in OM&R.
- 7.8 Broadly, in considering the scope for efficiency improvement we have adopted the approach commonly used by economic regulators, that is to consider three aspects of efficiency in order to inform our judgements:
- **catch-up efficiency:** the efficiency improvement that Network Rail should make in order to close the gap between itself and the best (or better) performing companies against which we have benchmarked the company;
 - **frontier-shift efficiency:** the continual improvement in efficiency (above that reflected in RPI) that would be expected from even the best (or better) performing companies;³⁹ and
 - **input prices:** the impact of expected input price inflation on Network Rail's cost base (above that reflected in RPI) which reduces the effective level of efficiency improvement possible.
- 7.9 In ACR03 we defined our assumptions for efficiency improvement in CP3 in terms of unit cost efficiency, i.e. that the 31% efficiency assumption factored into access charges in CP3 should be delivered through reductions in the unit costs of activity and not through reductions in the level of activity itself (which is scope efficiency). We considered this was right for CP3 given the importance of focusing on unit cost reductions following the significant increase in unit costs following the Hatfield derailment. In practice, however, it can be difficult to distinguish between unit cost and scope efficiency.
- 7.10 In CP3 Network Rail has made progress on establishing a suite of unit costs for renewals and maintenance, which can be used to monitor the company's performance. However, its progress in developing this has been slow, and the coverage of the cost base is not as comprehensive, as we expected. In 2007-08, Network Rail was able to report on unit costs covering only 50% of total renewals expenditure. Furthermore the majority of the reported data was not sufficiently robust at a disaggregated level to be used in internal efficiency benchmarking.
- 7.11 In CP4 we will continue to monitor Network Rail's performance in unit cost efficiency but the judgements we have factored into access charges are based on both unit cost and scope efficiency. We will also monitor overall efficiency in CP4. Therefore, as long as Network Rail delivers its output

³⁹ We use the retail price index (RPI) to rebase annually Network Rail's access charges and revenue requirement. RPI already reflects general, economy-wide productivity growth and input price inflation.

obligations in CP4 and does not compromise long term asset condition and serviceability, we are indifferent to the source of the efficiency improvement, i.e. it can come from either scope or unit cost efficiency. However, we still expect the company to improve its framework for measuring unit costs, which it should require for its own management purposes irrespective of our requirements.

- 7.12 We will continue to assess the cost reductions Network Rail achieves each year in order to evaluate the extent to which real efficiency is achieved (unit cost or scope) or whether the reduction in expenditure is just deferral.

Efficiency improvement in CP3

- 7.13 In ACR03 we determined Network Rail's revenue requirement on the assumption that unit cost efficiency could be improved by 31% by the end of CP3, with the principal driver being the urgent need to address the significant increase in unit costs following the Hatfield derailment (as summarised in chapter 6 of the final conclusions of ACR03).⁴⁰
- 7.14 We report the actual efficiency improvement that Network Rail has achieved each year in our annual assessment. Our analysis of the company's performance over the first four years of CP3 shows that it is behind our assumptions for CP3 efficiency improvement.⁴¹
- 7.15 In its SBP Network Rail set out its expected level of efficiency improvement in CP3. The company said it would achieve in overall terms 30% for OM&R rather than 31%. In its SBP update it reduced its forecast for the CP3 outturn, due to slow progress in achieving track renewals efficiency. Overall the company is now projecting efficiency improvement over CP3 of 27%. Table 7.1 shows Network Rail's projected cumulative efficiency improvement in CP3 along with the assumptions we made at ACR03.

⁴⁰ *Access Charges Review 2003: Final Conclusions*, Office of the Rail Regulator, December 2003. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/184.pdf>.

⁴¹ Chapter 5 of our annual assessment provides further details: *Annual Assessment of Network Rail 2007-08*, Office of Rail Regulation, September 2008. This may be accessed at www.rail-reg.gov.uk/upload/pdf/378.pdf.

Table 7.1: CP3 cumulative efficiency improvement (actual and projected)

| | 2004-05 (%) | 2005-06 (%) | 2006-07 (%) | 2007-08 (%) | 2008-09 (%) |
|--------------------------|----------------|----------------|----------------|----------------|----------------|
| Controllable opex | | | | | |
| ACR03 final conclusions | 6 | 15 | 22 | 26 | 30 |
| Network Rail | 16 | 24 | 25 | 26 | 29 |
| Maintenance | | | | | |
| ACR03 final conclusions | 8 | 15 | 22 | 28 | 34 |
| Network Rail | 10 | 19 | 26 | 30 | 32 |
| Renewals | | | | | |
| ACR03 final conclusions | 6 | 15 | 22 | 26 | 30 |
| Network Rail | 8 | 15 | 23 | 18 | 23 |
| Total | | | | | |
| ACR03 final conclusions | 8 | 15 | 22 | 27 | 31 |
| Network Rail | 10 | 18 | 24 | 23 | 27 |

Note: Network Rail's actual performance is based on our annual assessments during CP3 and the projection for 2008-09 is the company's own.

Network Rail's proposals for CP4

7.16 At the start of PR08 we asked Network Rail to provide comprehensive and robust efficiency forecasts as part of its SBP submission. Network Rail has undertaken a large amount of work, which it has explained in its SBP and its SBP update. It has also published a number of consultancy studies that it commissioned to support its submission.⁴² Network Rail's work can be grouped into four broad areas:

- specific initiatives that the company has identified which have been translated into efficiency improvements that it considers it can achieve in CP4 across maintenance and renewals – we refer to this as a 'bottom-up' assessment;
- a number of consultancy studies examining the scope for efficiency in specific areas. For M&R these include: LEK's internal renewals benchmarking study between Network Rail's territories, LEK's study on input price inflation and AT Kearney's study on the scope for efficiency in procurement. For opex, Network Rail commissioned benchmarking reports on its human resources, finance and IT functions (which together only comprise a small share of its total controllable opex);

⁴² The documents that Network Rail submitted in support of its SBP, including key efficiency studies, may be accessed on Network Rail's website at <http://www.networkrail.co.uk/aspx/4352.aspx>.

- consideration of efficiency studies that either we, or others, had undertaken. In particular: our international signalling and possessions benchmarking studies, and the various studies commissioned by EWS: Lloyds Register's study on track renewals efficiency, DTM Consulting's study on the scope for cost savings in the management of freight only lines and the LEK/TTCI study benchmarking Network Rail's costs against the Class 1 railroads in North America; and a study by the senior Canadian track engineer (Brian Abbott) on renewals efficiencies (commissioned jointly by EWS and Network Rail); and
- studies commissioned by Network Rail which specifically respond to our work and the judgements we made on the scope for efficiency which we set out in our update on the framework for setting outputs and access charges in February 2008 (in terms of initial views) and in our draft determinations. This includes the BSL international benchmarking assessment, the LECG study on the scope for opex efficiency gains in CP4, the LECG review of our international benchmarking work, and a report by Horton 4 Consulting.

7.17 In its SBP, Network Rail has proposed 'gross' efficiency savings of 17.6% across OM&R. These values are unchanged from the initial 'reference assumptions' it included in its ISBP in June 2006. Network Rail has reduced these gross efficiencies based on its view of input price effects. The company's 'net' efficiency proposals are approximately 12.5% (weighted across OM&R). The company's proposals are shown in table 7.2.

Table 7.2: Network Rail's OM&R efficiency projections for CP4

| | 2009-10 (%) | 2010-11 (%) | 2011-12 (%) | 2012-13 (%) | 2013-14 (%) | CP4 (%) |
|---|-------------|-------------|-------------|-------------|-------------|-------------|
| Gross efficiency | | | | | | |
| Controllable opex | 5.0 | 5.0 | 4.0 | 3.0 | 2.0 | 17.6 |
| Maintenance | 5.0 | 5.0 | 4.0 | 3.0 | 2.0 | 17.6 |
| Renewals | 5.0 | 5.0 | 4.0 | 3.0 | 2.0 | 17.6 |
| Input price inflation (above RPI) | | | | | | |
| Controllable opex | 2.3 | 2.3 | 1.1 | 1.1 | 1.1 | 8.1 |
| Maintenance | 2.0 | 2.1 | 1.3 | 0.5 | 0.5 | 6.6 |
| Renewals | 0.9 | 1.4 | 0.8 | 0.1 | 0.2 | 3.5 |
| Net efficiency (gross efficiency less input price inflation) | | | | | | |
| Controllable opex* | 2.8 | 2.8 | 3.0 | 1.9 | 0.8 | 10.9 |
| Maintenance | 3.1 | 3.0 | 2.7 | 2.5 | 1.5 | 12.2 |
| Renewals | 4.1 | 3.7 | 3.2 | 2.9 | 1.8 | 14.8 |

* Network Rail's calculation for the impact on controllable opex excluding signallers, insurance and pensions. The impact on total controllable opex is 7.4%.

7.18 The specific initiatives that Network Rail identified in OM&R are lower than its 17.6% gross efficiency target. In order to achieve the 17.6% level of gross efficiency in each expenditure category, Network Rail has added a 'stretch' element, which it describes as efficiency initiatives that it has not yet identified, informed by management judgement. This is summarised in table 7.3.

Table 7.3: Network Rail's identified CP4 efficiency savings and stretch

| | Controllable opex (%) | Maintenance (%) | Renewals (%) |
|-------------------------|------------------------------|------------------------|---------------------|
| Identified savings | 5.9 | 16.7 | 12.6 |
| Stretch | 11.7 | 0.9 | 5.0 |
| Gross efficiency | 17.6 | 17.6 | 17.6 |

7.19 Whilst Network Rail has made no changes to its headline efficiency projections in its SBP update, it has effectively increased its CP4 renewals efficiency profile as it said that it will clawback the shortfall (against the ACR03 determination) in CP3 track renewals efficiency that it was projecting at the time. This effectively increases the company's projected gross renewals efficiency improvement in CP4 from 17.6% to 19.1%. As we indicate above, since the time of the SBP update Network Rail's forecast CP3 outturn performance on renewals efficiency has deteriorated and it will now have a level of renewals efficiency at the end of CP3 that is a further 2.8% worse than it assumed in its SBP update and which we also assumed for our draft determinations.

Our work to develop our efficiency judgements

7.20 Our work to develop our judgements on the scope for OM&R efficiency in CP4 falls into a number of broad areas (the work on enhancements is covered in chapter 9):

- **our assessment of Network Rail's proposals:** we have undertaken a thorough and detailed review of Network Rail's proposals and supporting evidence;
- **international benchmarking:** we have undertaken top-down benchmarking analysis, which has included benchmarking Network Rail's maintenance and renewals costs against overseas rail infrastructure managers; benchmarking its approach to asset management versus international best practice; and benchmarking of signalling and possessions efficiency relative to its international peers;
- **work to understand the efficiency gap:** in light of the results from the international benchmarking we have carried out work to understand the efficiency gap between Network Rail and its international peers;

- **opex benchmarking:** we commissioned a top-down benchmarking study from Oxera, which in part updates the LEK/Oxera study undertaken in 2005 on the scope for efficiency improvement in CP4, focusing on opex;
- **assessment of frontier shift:** the benchmarking study commissioned from Oxera also assessed the scope for frontier shift in OM&R;
- **detailed opex efficiency studies:** we commissioned a number of specific studies to assess the scope for opex efficiency improvement;
- **consideration of inputs by other stakeholders:** other stakeholders have submitted views and evidence on efficiency to PR08, including EWS and RIA. We have considered all this evidence in making our judgements; and
- **input prices:** we have considered the appropriate treatment of input price inflation and undertaken a review of Network Rail's specific input price proposals.

Bottom-up and top-down approaches

7.21 We have used a wide variety of approaches to analyse the scope for efficiency. No single approach will necessarily provide a definitive answer on the scope for future efficiency improvement. We have therefore looked at evidence from a range of approaches and an extensive number of sources and exercised a degree of judgement in forming our view on what should be achievable in CP4. In common with other economic regulators, we have used both top-down and bottom-up approaches to assess the scope for efficiency improvement. 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. Top-down approaches typically utilise statistical techniques to produce high-level comparisons between companies or industries taking into account trends over time. 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.

Our assessment of Network Rail's proposals

- 7.22 We have carefully reviewed Network Rail's detailed proposals. In doing this, we have engaged closely with Network Rail and its consultants over the course of PR08. We also engaged Ernst & Young to support us in our assessment.
- 7.23 The company has undertaken a large amount of work to inform the efficiency assumptions it presented in its SBP. However, we believe that, overall, Network Rail has fallen short of providing comprehensive analysis to support its assumptions. And whilst we welcome the generally transparent approach that Network Rail has applied to developing its efficiency proposals we believe

that the analysis contained in its SBP significantly understates the scope for efficiency improvements in CP4.

7.24 We asked Ernst & Young to review whether Network Rail had adopted a reasonable and robust approach to combining the results of its own internal assessments and the findings of the other efficiency studies available in establishing its proposals for efficiency improvement.⁴³

7.25 Ernst & Young's key conclusion is that it does 'not believe it to be unreasonable to expect that the 17.6% total efficiency target could be increased.' Key findings from Ernst & Young's review are:

- Network Rail's approach is structured and Ernst & Young recognise the progress made since Network Rail took over Railtrack (in administration). Network Rail was open and constructive in supporting Ernst & Young's assessment;
- there is limited evidence to support Network Rail's overall 17.6% efficiency target. It is based on a management view of what was considered achievable (and was unchanged in the SBP and the SBP update from the ISBP in June 2006, when Network Rail said that its efficiency proposals should only be treated as 'reference assumptions'). There is no explanation or justification by Network Rail of why the 17.6% target should apply across OM&R equally, and Ernst & Young say that this approach appears unusual, particularly when the bottom-up initiatives for OM&R vary so considerably;
- there are some numerical inconsistencies in its efficiency models. Although Ernst & Young say that these are not significant they do say it raises some questions about the quality of the process;
- there must be questions over how challenging the bottom-up projections provided by Network Rail are, since they were developed by the managers responsible for delivering them in CP4. Ernst & Young say they would have expected some external challenge of the targets but there is no evidence of this having taken place;
- there are some concerns about the audit trail and justifications provided for all of Network Rail's proposals. They highlight opex, where the majority of Network Rail's proposed efficiency improvements for CP4 are in the stretch category;
- the issue of stretch raises concerns. Network Rail has applied stretch to bridge the gap between the specific efficiency initiatives identified and its 17.6% target. Ernst & Young suggest that if we seek to determine higher levels of efficiency then Network Rail may just argue that these are part of the stretch. However, Ernst & Young say that this would not be a convincing argument since there is no evidence to justify the stretch values – they are simply 'bridging' numbers. Furthermore, Ernst & Young say that,

⁴³ *Assessing the Efficiency Component of Network Rail's Strategic Business Plan*, Ernst & Young, 29 February 2008. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/pr08-ernsteffic-290208.pdf>.

by definition, Network Rail is prepared to take the risk on the stretch values and, as such, these values could be applied in addition to any increase in the level of bottom-up initiatives;

- Ernst & Young highlight that in some cases Network Rail has adopted conservative assumptions for CP4 efficiency improvements from the findings of its internal renewals benchmarking (undertaken by LEK) and procurement (AT Kearney);
- the inability to undertake internal benchmarking for maintenance is highlighted as a deficiency – and Ernst & Young identify that Network Rail's own consultants say that further maintenance efficiencies may be identifiable with a better quality dataset; and
- Network Rail makes no reference to the further efficiencies that may be expected from introducing unsupported debt, due to the additional scrutiny and controls from prospective and actual lenders. As such, further efficiencies may be achievable in addition to Network Rail's proposals.

7.26 Network Rail did not challenge Ernst and Young's assessment in its response to our draft determinations.

International benchmarking

7.27 External cost benchmarking (i.e. comparing a company's costs to a reference level that cannot be influenced by the company concerned) is widely used by regulators to inform their judgement on the extent to which companies can improve cost efficiency. Comparing Network Rail to its direct peers, i.e. other rail infrastructure managers, can provide insights into industry best practice and the relative efficiency of Network Rail.

7.28 As Network Rail is a national monopoly, there are no domestic comparators. We have therefore compared Network Rail to an international peer group. This peer group consists predominantly of Western European comparators in which the infrastructure and operating conditions are most similar to Network Rail's, though North America may also provide a useful benchmark. We have undertaken a range of international benchmarking in CP4 to inform our judgements on efficiency:

- total maintenance and renewals;
- signalling and possessions; and
- asset management (which also includes non-rail domestic as well as international comparisons).

International maintenance and renewals benchmarking

- 7.29 We have used statistical techniques to benchmark Network Rail's maintenance and renewals efficiency.⁴⁴ These produce a single performance measure that simultaneously takes account of variation in several cost drivers, which can provide a more sophisticated and accurate assessment than one provided by unit cost measures alone. We have conducted the international benchmarking in conjunction with Network Rail and the Institute for Transport Studies (ITS) at the University of Leeds.⁴⁵
- 7.30 There are two strands to our international maintenance and renewals benchmarking work:
- the first, which we have undertaken together with Network Rail, uses the 'lasting infrastructure cost benchmarking' (LICB) dataset compiled by the International Union of Railways (UIC). This dataset comprises maintenance and renewals expenditure and cost driver data for 13 European rail infrastructure managers, including Network Rail, for the eleven years to 2006. We have shared the work with UIC who intend to evaluate the potential use of the econometric approach in their own work; and
 - the second uses sub-national data from five rail infrastructure managers in Europe and North America that we have collected directly from the infrastructure managers. Again we have benchmarked maintenance and renewals expenditure, but this time for a time period of up to five years (depending on the company); though for Network Rail, the data relates to a single year, 2006.
- 7.31 We are grateful to the UIC for providing us with access to their dataset, and to Network Rail for working constructively with us (although it has provided extensive criticisms of our analysis and findings, as discussed below). We are also grateful to the infrastructure managers that have worked with us directly to provide the sub-national data. We have shared the results with them. The outputs of this work, while demonstrating the power of international benchmarking, are specific to PR08 and our assessment of Network Rail. This document and our published report say nothing about the relative efficiency of any of the comparators to Network Rail. In the future we hope that the approach can be developed further. In the case of the sub-national level

⁴⁴ In other words, we have modelled costs as a function of a number of cost drivers, estimating the parameters of the model using statistical techniques, and thus deriving a measure of relative efficiency for each company.

⁴⁵ A powerpoint presentation summary of our work is *International benchmarking of Network Rail's maintenance and renewals costs*, Institute of Transport Studies and Office of Rail Regulation, May 2008 is available at <http://www.rail-reg.gov.uk/upload/pdf/pr08-its-010608.pdf>. ITS has also written a lengthy technical paper to explain its analysis in detail: *International Benchmarking of Network Rail's Maintenance and Renewal Costs: Analysis Based on the LICB Dataset*, Institute of Transport Studies, October 2008. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/pr08-itslicb-301008.pdf>.

benchmarking, we hope to be able to include a greater number of companies in the peer group in future.

- 7.32 We consider that the econometric models we have developed are robust, both statistically and from an engineering perspective.⁴⁶
- 7.33 We recognise that benchmarking, and particularly international benchmarking, is difficult. In particular, we recognise that the available data (for instance in the LICB dataset) does not enable us to explain fully the difference between Network Rail's cost base and that of its peers. We have therefore taken considerable effort to understand from a qualitative and, where possible, quantitative perspective the impact that omitted variables might have on Network Rail's score. We have undertaken a substantial amount of work to understand the results from an engineering perspective and, where there is uncertainty, taken an approach that we believe is favourable to Network Rail. In parallel, we have also taken an alternative assessment to the international benchmarking to estimate the cost that Network Rail would incur in running other networks (in other words, given key characteristics of other networks, what would the impact be on Network Rail's cost base if it were responsible for them). Network Rail also commissioned its own work to explain the gap between it and its peers, and the reasons for this gap, taking into account factors not explicitly included in the LICB dataset (e.g. relating to asset condition). The results of this work, discussed further below, confirm the results of our international benchmarking work. We have also undertaken further work since our draft determinations to examine the issue of steady-state renewals.
- 7.34 There remain further factors which are referred to by stakeholders or that we are aware of could have an influence on relative costs. For instance the relatively closer track spacing in GB compared to other European railways, which, when taken account of, would be likely to reduce the cost differential, has been cited by RIA as a factor which should be taken explicit account of. Whilst we recognise that there are factors which could hamper the achievement of the levels of efficiency observed in better performing European railways, there are other factors, for instance the lower density of bridges and tunnels on the GB network compared to the average of the peer group we have examined, which, when taken account of, would be likely to increase the cost differential. Overall we do not think that the exclusion of omitted variables has biased our results in a material way, either in Network Rail's favour or against it, especially given the conservative assumptions we have adopted and the significant difference between our efficiency assumptions for CP4 and our estimate of the efficiency gap.
- 7.35 Based on the econometrics and the other available evidence, we believe that the results of our international benchmarking demonstrate that there is

⁴⁶ In that the diagnostics for the model are strong and that the sign and size of the model parameters accord broadly with engineering judgment and with other econometric studies.

considerable scope for Network Rail to improve its maintenance and renewals cost efficiency versus the peer group.

Benchmarking using the LICB dataset

7.36 The LICB dataset includes data for Network Rail and 12 other European rail infrastructure managers.⁴⁷ The UIC has collected and refined this data with its members over the last 11 years. The data for which there was sufficient coverage for benchmarking purposes is summarised in table 7.4.

Table 7.4: LICB dataset – variables used

| Cost data | Final output data | Network size data | Network characteristic data |
|-------------------------------------|--------------------|----------------------|-----------------------------------|
| Maintenance costs | Passenger train km | Track km | Ratio of single track to route km |
| Total maintenance and renewal costs | Passenger tonne km | Route km | Proportion of track electrified |
| | Total tonne km | Single track km | Number of switches per track km |
| | Freight train km | Electrified track km | |
| | Freight tonne km | | |
| | Total train km | | |

7.37 In order to make the cost data comparable, we have adjusted the data into common currency using purchasing power parity (PPP) exchange rates and converted them into constant prices. The data therefore take into account differences in price (including wage) levels at the economy wide level, though they do not take into account any relative differences between rail specific and whole economy price levels.

7.38 The benchmarking methodologies that we have adopted are widely used. The methodologies construct an 'efficiency frontier', based on the performance of those companies in the peer group deemed to be most efficient. Any company located on the frontier is considered to be efficient. The relative efficiency of other companies is then determined by their 'distance' from this frontier. The further they are from the frontier, the greater is their scope for efficiency catch up.

⁴⁷ The dataset covers Network Rail, OBB (Austria), Infrabel (Belgium), BDK (Denmark), RHK (Finland), DB (Germany), Irish Railways, RS (RFI) (Italy), ProRail (Netherlands), Jernbaneverket (Norway), Refer (Portugal), Banverket (Sweden) and SBB (Switzerland). Further information on the LICB dataset and UIC is available at http://www.uic.asso.fr/uic/spip.php?page=imprimer&id_article=582 and a summary report is available at http://www.uic.asso.fr/reunion.php/20123/li06c_sum_en.pdf.

- 7.39 The fact that the dataset contains data for a number of infrastructure managers over a period of time provides a number of advantages over a dataset with only a single year of data. In particular:
- the estimate of Network Rail's efficiency gap is made more robust as the greater number of data points increases the available information and enables more complex modelling techniques to be used; and
 - it allows us to study the time path of efficiency as well as the absolute levels at a point in time.
- 7.40 We have tested a variety of models. Our preferred model considers total maintenance and renewals expenditure as a function of route km, passenger train density, freight train density, the proportion of track that is single track, the proportion of track that is electrified, and time. The single track and electrification variables provide an indication of the complexity of the track and the nature of the assets being maintained / renewed. We believe that the model is robust both from an econometric perspective and from an engineering perspective. It is robust to changes in both methodology and small changes to the underlying data.
- 7.41 Although we have also modelled maintenance and renewals costs separately, our preferred model is based on combined costs. We consider that this is appropriate as it means that both the trade-offs between maintenance and renewals, and any accounting differences between countries in the way in which they record maintenance and renewals costs, are taken into account (although we are not aware of any material differences in accounting treatment in the LICB dataset).
- 7.42 Network Rail has asserted that at least part of the difference between its current expenditure levels and those of its peers in Europe is due to it renewing assets at a rate greater than the steady state as it continues to redress the backlog built up in the years before the Hatfield derailment. We accept that this may account for part of the difference. To ensure that the benchmarking does not penalise Network Rail unfairly for this, we have made an adjustment to Network Rail's renewals data that assumes its track and signalling renewals volumes are running ahead of steady state. We have not adjusted the data for the other companies in this way. We are therefore assuming that, on average, the leading firms are in steady state. We recognise the importance of the 'steady-state' issue and have done further work on this since we published our draft determinations, which is discussed further below.

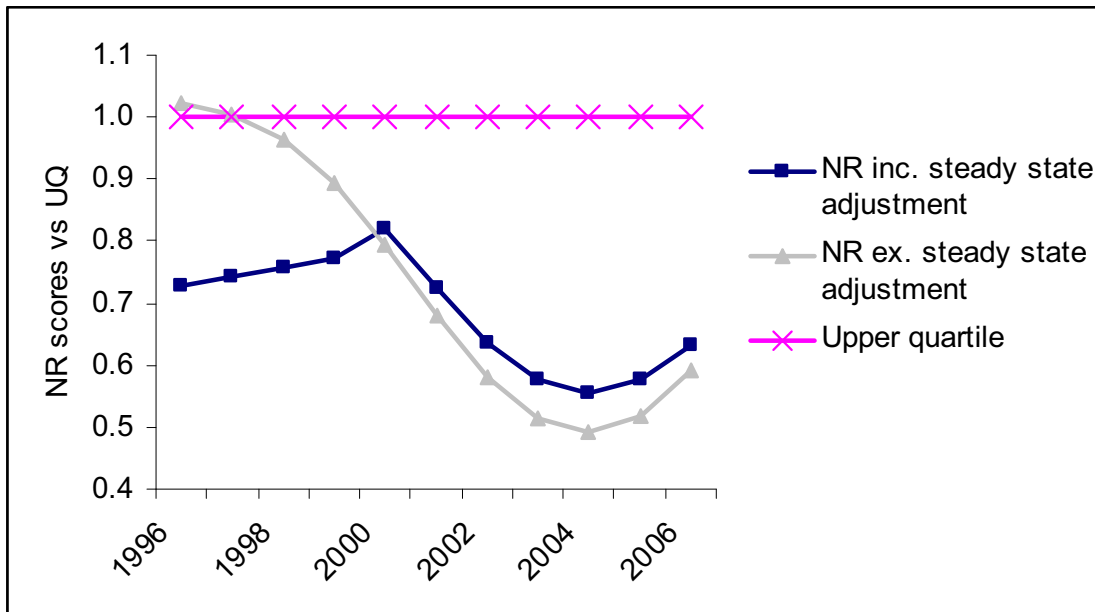


Figure 7.1: Evolution of Network Rail's efficiency score versus the upper quartile for our preferred model

7.43 Figure 7.1 shows the evolution of Network Rail's efficiency score against the upper quartile comparator over the period 1996-2006. The potential inefficiency (as a share of maintenance and renewal expenditure) is calculated as 1 minus the efficiency score. Therefore, the higher the efficiency score, the more efficient Network Rail is in relation to the peer group. As can be seen, Network Rail's relative efficiency declined markedly between 2000 and 2004, even taking into account the steady state adjustment. However it has started to recover since 2004, which is to be expected given the significant efficiency improvements the company achieved in the first three years of CP3. The chart also suggests that renewals were running well below the steady state level prior to 2000, but slightly above steady state thereafter, on the basis of the adjustment we have made.

7.44 The scores shown on the chart are against the upper quartile. Scores against the frontier company are slightly lower. Our preferred model, including the steady state adjustment, suggests that Network Rail was around 37% less efficient than the top quartile of the peer group in 2006. We consider that our approach is favourable to Network Rail as:

- we have sought to ensure that our approach takes account of uncertainty, and therefore avoids comparing Network Rail's performance to a company exhibiting particularly low cost in a particular year. We have adjusted for differences in steady-state levels of asset renewals; and
- we have benchmarked Network Rail against the upper quartile rather than the frontier (i.e. best performing firm). This is a very prudent approach, which is generous to Network Rail. Normally, using the type of

econometric modelling approach we have used (stochastic frontier analysis), it is appropriate to benchmark to the frontier firm and not 'aim off', since stochastic frontier analysis takes account of measurement error in the data.

Benchmarking using the regional international dataset

- 7.45 We have also worked with five infrastructure managers in Europe and North America to collect data at the sub-national level in order to conduct separate and independent analysis to the work using the LICB dataset. The infrastructure managers are Network Rail, Amtrak (North East US), Infrabel (Belgium), Irish Rail, and ProRail (Netherlands). We have collected data for a time period of up to five years (depending on the company); though for Network Rail, the data relates to a single year, 2006. Collecting data at the sub-national rather than national level enables us to take an alternative view of the variability of costs and to expand the dataset (to 52 data points), aiding statistical analysis.
- 7.46 In contrast to the LICB dataset, this is a new dataset. The methodology we have used is also somewhat novel in that we have combined regional data across a number of countries. Further exploration of the results with participants is required before we can have full confidence in them. However, they provide a useful crosscheck of the results obtained from the LICB dataset. In the future, we hope to be able to develop the analysis further, bringing other companies into the study.
- 7.47 The approach taken is similar to that for the LICB dataset. Total maintenance and track renewals costs are modelled as a function of passenger and freight tonne km (or total tonne km), track length, and the proportion of track electrified, though costs are benchmarked at the Network Rail 'area' level rather than at the national level.⁴⁸
- 7.48 The preliminary results highlight a significant gap in costs between Network Rail and the other infrastructure managers. In particular, our preferred model, suggests a gap of 44% to the frontier. Though the precise results from the regional international benchmarking need to be interpreted with caution at this stage, they are valuable in providing strong support for the analysis based on the LICB dataset.

Network Rail's response to the econometric analysis

- 7.49 Network Rail made an extensive and critical response of the econometric analysis international benchmarking work, and the resulting efficiency gap, in its draft determinations response. It also provided detailed reports by its advisers, LECG and Horton 4 Consulting, on efficiency. Network Rail and its advisers have levelled a range of criticisms, principally relating to:

- an apparent lack of transparency and documentation (audit trail);

⁴⁸ There are 18 Network Rail areas.

- the data quality of the LICB dataset;
- the need to adjust fully for steady state renewals levels across all countries;
- the need to include other parameters in the model; and
- the functional form and coding of the econometric model.

- 7.50 In its response Network Rail did not propose an alternative estimate of the efficiency gap although it accepts that there is substantial scope for improvement in efficiency throughout the company. LECG, in its report for Network Rail, did produce an alternative econometric model.
- 7.51 We were surprised by parts of Network Rail's response, since the econometric analysis work was undertaken by ITS working closely with both Network Rail and ourselves since April 2007. We have always welcomed the involvement of Network Rail in the process and have appreciated its input to this workstream. Network Rail has had access to the data throughout the process and we have engaged closely with the company on the modelling, sharing with them technical papers and model results during the process.
- 7.52 Whilst we recognise that there are aspects of the econometric analysis that it has continually challenged, in particular relating to the exclusion of other factors from the analysis, e.g. relating to steady-state, it has had ample opportunity to comment on the work throughout. In undertaking the work, and developing the preferred model, extensive sensitivity analysis was undertaken, various model formulations were considered, and there was engagement with Network Rail to share, discuss and understand the results. There were numerous meetings with ITS, ourselves, Network Rail and the company's advisers during the process to discuss and share the evolving results of the modelling. ITS additionally worked with Network Rail's consultants since the draft determinations to provide detailed information and to explain how the preferred model was developed.
- 7.53 We are surprised that the general thrust of its critique of the econometric analysis appears to dismiss the notion of a significant efficiency gap with its European peers, rather than focusing on the more important issue to understand how the gap can be closed and the time period over which this can be achieved.
- 7.54 Network Rail has had access to the UIC dataset since February 2007. At no point has Network Rail demonstrated any significant flaws with the quality of the data. Network Rail's own consultants BSL have used it in the benchmarking they undertook. During the previous ten years, there has been significant development of the harmonisation process has been undertaken by UIC to ensure comparability. The UIC's own report also states that the data is robust and can be used to benchmark railways. Finally, we carried out data inspection and cleaning prior to the analysis.

- 7.55 ITS has provided a detailed response to the issues that Network Rail and its consultants have raised. We also asked Dr Michael Pollitt of the Judge Business School at the University of Cambridge to undertake a review of ITS's response.⁴⁹
- 7.56 In summary, ITS's response provides a very clear and complete rebuttal of the criticisms made by Network Rail and its consultants of the econometric analysis study. The ITS response clearly demonstrates the robustness of the work carried out. In particular ITS confirm the validity of the preferred econometric model, from both from a statistical and economic theory viewpoint. ITS also show that there is a very wide range of supporting econometric evidence for the preferred model (e.g. from different model formulations and econometric techniques). In conclusion, ITS does not see any reason to change its view of the preferred model and hence the efficiency gap that Network Rail faces. Dr Pollitt has reviewed ITS's response and he notes that ITS has addressed and rebutted all the substantive points that Network Rail's consultants have made. In addition to this, Dr Pollitt has commented on our approach to using the upper quartile results (rather than the frontier) and basing our efficiency judgements of two-thirds of the gap from that. He highlights that there is no need to make the adjustment from the frontier to the upper quartile on theoretical grounds and that making efficiency judgements based on two-thirds of the gap adds to our generous approach towards Network Rail.

Understanding the efficiency gap

- 7.57 Given the significant efficiency gap that our econometric analysis has revealed between Network Rail and its peers we have undertaken work to confirm whether this gap can be explained and attributed to inefficiency. This is an issue that Network Rail and RIA have raised throughout PR08 and in their draft determinations responses. We have done extensive work to develop an understanding of the reasons for the gap. In addition to the work we carried out ahead of making our draft determinations, we have also undertaken further work since then to consider the issue of steady-state renewals in more detail and we have commissioned further work from RailKonsult.
- 7.58 Our work to understand the efficiency gap has included a significant engineering assessment. It is important to note, however, that it is not the purpose of our work to provide a fully detailed plan to necessarily explain the entire gap and set out exactly how Network Rail can achieve higher levels of efficiency – that is for the company's management.
- 7.59 The key areas of work are:

⁴⁹ *A Response to the LECG and Horton 4 Consulting Reports on the ITS/ORR International Benchmarking Study (Based on the LICB dataset)*, Institute of Transport Studies, October 2008. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/pr08-itsbench-301008.pdf>. *Review of Response Documents for ORR*, Dr Michael Pollitt, October 2008. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/pr08-pollrvw-241008.pdf>.

- the lessons learnt from our international visits;
- the alternative normalisation work we have carried out;
- the work on technologies and working methods used in Europe carried out by RailKonsult (including further work carried out since our draft determinations);
- the BSL study for Network Rail; and
- our further work.

Lessons learnt from our international visits

- 7.60 During 2007 we undertook a range of visits to infrastructure managers in Europe, North America and Australia.⁵⁰ The specific aim of this visit programme was to gain information and better understand practices adopted by other rail infrastructure managers to help us in our assessment of Network Rail's SBP and the scope for efficiency improvement.
- 7.61 The visits highlighted a range of engineering and asset management approaches that could be used in Great Britain to improve efficiency. Evidence of potentially more effective and/or efficient practice in other countries included:
- evidence of improved asset management;
 - use of innovative asset inspection methods;
 - more use of risk based maintenance; and
 - quicker processes for taking and giving up track possessions than is currently achieved in Britain.
- 7.62 Network Rail recognises and is taking steps to consider, if not implement, many of the technologies and working methods identified. Our visits also highlighted that the lessons to be learnt are not all 'one way', and there are areas where Network Rail's practices are as good as or superior to those in other countries. There are many opportunities for Network Rail to investigate, compare itself, challenge its existing practices and consider adopting ideas and initiatives from other railways. If it is to become a truly world class company, Network Rail must be active in seeking to identify and implement best practice. Network Rail needs to ensure that it continues, and enhances where possible, interaction with other railway organisations as a basis for further improvement.
- 7.63 Network Rail did not comment on this work in its response to our draft determinations, having included a response in its SBP update.

⁵⁰ *ORR Best Practice Study: A report on the programme of international visits carried out by ORR between July – October 2007 (Summary Report)*, Office of Rail Regulation, March 2008. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/wbps-rail-summary-reprt2.pdf>.

Alternative normalisation

- 7.64 In order to understand better the results of our econometric analysis of the LICB data we undertook our own work to compare the GB network with four of the main comparators in Europe (Belgium, Germany, Netherlands, Switzerland), who all operate at lower cost than Network Rail.⁵¹ The objective was to examine what would happen to Network Rail's projected CP4 cost base if it were required to operate the network capability and usage characteristics of each of the four comparators. We examined a number of key criteria that are an important driver of infrastructure costs: tonnage, axle load, switch and crossing density, linespeed profile, extent of bi-directional signalling and extent of electrification. Our study estimated that Network Rail's cost base would rise by between 20% and 40% depending upon which individual railway was used as comparator. This needs to be seen in the context of these comparators already operating at lower cost than Network Rail (on average some 20% prior to any normalisation except for PPP). This work provides further evidence of the existence of a significant efficiency gap between Network Rail and its peers in Europe, and it substantiates the broad conclusions reached by our econometric analysis.
- 7.65 In its response to our draft determinations Network Rail did not comment extensively on this work. Network Rail acknowledges that the analysis provides evidence of an "expenditure gap". There will clearly be other factors, not included in the analysis, that may reduce, or increase, the cost differential between Network Rail and its peers. Network Rail has not provided any evidence that these other factors will have a material bearing on the overall efficiency gap. We remain of the view that this study provides further evidence that there is a significant efficiency gap between Network Rail and its peers.

BSL analysis

- 7.66 BSL (a German consultancy that is part of Lloyds Register Rail) was commissioned in early 2008 to help Network Rail understand better the nature of the cost gap between itself and the LICB comparators. The analysis presented by BSL included the data for the European infrastructure managers used in the LICB study and added other railways, including, Amtrak (the state owned US passenger company).⁵² BSL's work had two distinct parts:
- explanation of the efficiency gap, through identification of factors which make the British network more expensive to operate compared to the peer group; and

⁵¹ *Expected Cost of Network Ownership: Network Rail and Key LICB Comparators: Initial Results*, Office of Rail Regulation, 7 March 2008. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/pr08-smith-070308.pdf>.

⁵² *Rail Infrastructure Cost Benchmarking: Brief LICB-gap analysis and cost driver assessment*, BSL, April 2008. This may be accessed on Network Rail's website at [http://www.networkrail.co.uk/browse%20documents/StrategicBusinessPlan/Update/Cost%20benchmarking%20assessment%20\(BSL\).pdf](http://www.networkrail.co.uk/browse%20documents/StrategicBusinessPlan/Update/Cost%20benchmarking%20assessment%20(BSL).pdf).

- suggestions of possible efficiencies which could result from adoption of European best practice.

Explanation of the efficiency gap

- 7.67 Three major factors were put forward by BSL to explain the current cost gap:
- a widespread 'renewals holiday' undertaken by the comparators in the peer group leading to an unsustainably low level of expenditure compared with current levels by Network Rail;
 - greater asset age and poorer track quality requiring greater maintenance expenditure in Britain; and
 - higher labour costs in Britain.
- 7.68 BSL undertook a reconciliation of the gap between Network Rail and the *average* of other international rail infrastructure managers (it has augmented the UIC/LICB dataset with four further countries). BSL made a number of adjustments to account for its view of steady-state activity levels and worse asset quality in GB. Once this is done then the efficiency gaps between Network Rail and the average of the peer group in BSL's analysis reduce, to 44% for renewals and 27% for maintenance in 2006. These are similar to our econometric results (although as we note above our preferred model combines maintenance and renewals, and our gap is to the upper quartile rather than the average). BSL then goes on to account for the remaining gap, through adjusting for higher labour costs in GB compared to the peer group, applying Network Rail's proposed CP4 efficiencies (without adjusting for input prices), with the remainder accounted for by a range of possible additional future efficiency improvements.

Efficiency opportunities

- 7.69 BSL identified a number of areas for further efficiency improvement by Network Rail, including:
- improvement in track quality to realise additional savings in maintenance costs, for instance as happened in Sweden;
 - improved utilisation of the tamper fleet (which we note was also a conclusion from the Abbott report, discussed below, and the RailKonsult work);
 - economies of scale resulting from introducing longer work sites for renewals;
 - increasing the effective working hours within a possession; and
 - reducing transaction costs (e.g. relating to project planning and overheads).

Our view

7.70 We welcome BSL's work as a useful contribution to PR08. We have reviewed the work and have met BSL and Network Rail to discuss a number of issues, in particular the adjustments BSL has made for steady-state activity levels. We welcome the recommendations by BSL on further efficiency opportunities. However we have a number of key concerns about the work. In particular:

- we are not convinced by BSL's argument that the comparators, on average, need to increase their renewals levels by approximately 75% to achieve steady-state. If they have been under-renewing consistently over a long time period it is not clear why their average asset age is significantly lower than Network Rail's. It is also not clear why, for the overwhelming majority of the comparators, total renewals expenditure has increased over the last ten years and there has been no increase in maintenance costs (which would be expected if there was a major reduction in renewals levels over a prolonged period). Figure 7.2 shows the development of maintenance and renewals expenditure between 1996 and 2005 for the LICB comparators (including Network Rail) and clearly does not indicate any sustained under renewals across the LICB peer group;
- we do not consider it appropriate to benchmark Network Rail against the average of the peer group, and consider the upper quartile a more appropriate benchmark (for a company that itself aspires to world class status);
- we would also expect to find a clear relationship between under-renewal and maintenance spend if BSL's assertion were correct. For instance one or more of the following would be anticipated:
 - an increase in maintenance expenditure to compensate for lack of renewals (as shown above, the LICB figures show average maintenance spend remaining broadly constant over the period of study);
 - a significant fall in maintenance expenditure following the substantial pre-LICB (i.e. pre-1996) renewals programme implied by the coincidence of under renewal and low average asset age (the LICB figures show average maintenance spend remaining broadly constant over the period of study); and/or
 - a substantial reduction in network quality (which is not borne out by the number of train-delaying infrastructure incident data which BSL uses in its system reliability adjustment).

7.71 We have conducted our own work using BSL's data, but benchmarking to the *upper quartile* rather than the average of the peer group. This gives higher efficiency gaps, greater than 50% for both renewals and maintenance. In other words, even if we were to accept all the adjustments (for steady-state, asset age and labour cost differential) that BSL make, and take into account Network Rail's planned efficiencies for the remainder of CP3 as well as its proposed CP4 efficiencies this still leaves an additional efficiency gap of at least 20-25% for M&R.

7.72 Given the concerns that Network Rail has raised on the issue of steady-state renewals we have done additional work, discussed further below.

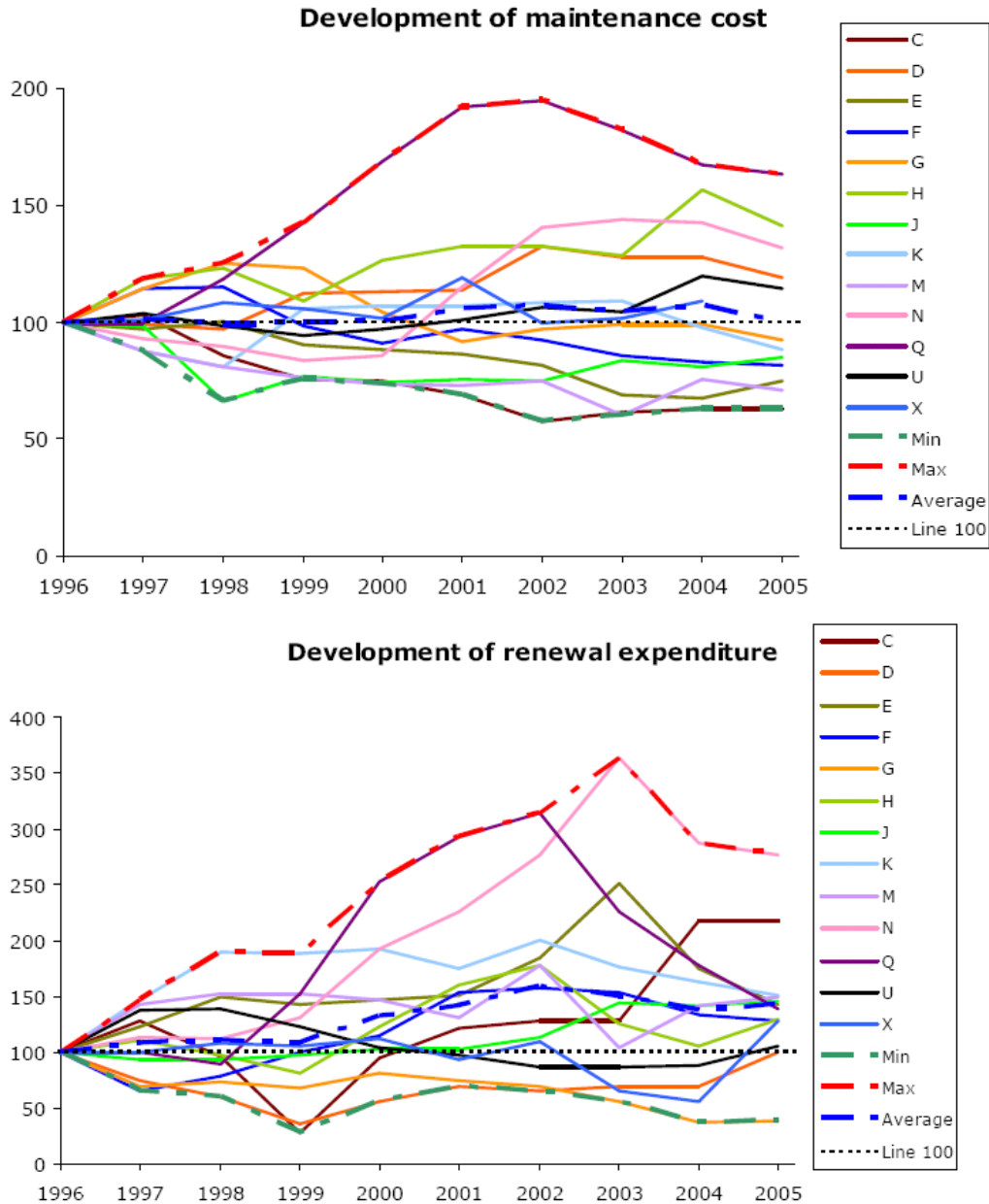


Figure 7.2: Indexed maintenance and renewals expenditure for the LICB comparators (source: UIC⁵³)

⁵³ The chart is taken from page 8 of *Lasting Infrastructure Cost Benchmarking (LICB): Summary Report*, UIC, December 2006. The report may be accessed at http://www.uic.asso.fr/reunion.php/20123/li06c_sum_en.pdf.

Other responses to our draft determinations on international benchmarking

7.73 BSL also undertook work for RIA as part of RIA's submission. We welcome this work which helps inform the understanding of Network Rail's relative efficiency. Although Network Rail clearly appears to have a lower level of efficiency than the East Asian railways in the study, the study also confirms that Network Rail's costs are significantly higher than its European peers. We believe that using western European railways is the most appropriate basis for benchmarking given the robust dataset and extensive harmonisation techniques developed and employed in the LICB project.

Further assessment of steady-state

7.74 We recognise that the issue of steady-state is important and it can influence the relative expenditure levels, and hence efficiency, for instance if there is a significant difference in renewals expenditure between the comparators in the dataset and if this is not adjusted for.

7.75 There is not a comprehensive dataset of actual renewals information for the LICB dataset which means that there is uncertainty and assumptions need to be made in adjusting for potential differences between comparators in the dataset. As we explained above, there is no clear evidence of significant levels of "renewals holidays" that may have impacted on our assessment. The trends in renewals expenditure show a general and clear upward trend across the LICB countries. We made what we consider to be a generous steady-state adjustment.

7.76 In its "10 year" report on the LICB study published in 2007, UIC included information on rail, sleeper and ballast renewals rates for some of the countries for 2004 – 2006. We have analysed this, and taking into account relative traffic levels (which have a significant bearing on track renewals rates), there does not necessarily appear to us to be a significant difference between Network Rail and the peer group.

7.77 However, we have done some further work to make a specific adjustment to the unit cost data produced by UIC (which has been the basis for the econometric analysis), in order to assess the impact on Network Rail's efficiency compared to the peer group if the relative levels of renewals are taken into account (at a simple level, without adjusting for traffic effects).

7.78 Our analysis shows (based on the UIC's 2005 published unit costs) that Network Rail's unit costs compared to the average of the peer group were for maintenance and renewals, respectively, 47% and 70% higher. In 2005, based on the information on track renewals rates that the UIC has published, Network Rail renewed around 2.7% of its track assets compared to an average of 2.1% for the peer group, a difference of around 35% (again, without adjusting for traffic levels).

- 7.79 The difference in UIC's comparison of harmonised unit costs (i.e. adjusted for network characteristics, traffic and purchasing power parity) between Network Rail and the average of the peer group (excluding Network Rail) was 70% in 2005. Once the difference in renewals activity levels is adjusted for (assuming that the difference in relative track renewals rates applies to all renewals activity) the difference reduces to 59%.⁵⁴ This analysis provides further evidence that, even after adjusting for relative renewals levels (albeit for a single year), there remains a significant differential in harmonised unit costs and relative efficiency.

Our conclusions on international benchmarking

- 7.80 Our view on international benchmarking has been formed after extensive work with ITS, the UIC, and Network Rail between April 2007 and June 2008. All of the methods we used consistently indicated a large efficiency gap. Our conclusion is based on overwhelming evidence from many sources, of which the international econometric benchmarking is simply one source. We have taken account of all the other evidence, including our own international visits and the work undertaken for us by RailKonsult.
- 7.81 We have considered carefully the ITS response to the criticisms made of the econometric work by Network Rail and its consultants. In doing this we have noted Michael Pollitt's review. On the basis of all this work and the evidence it produces, we see no reason to change our own view on the scope for efficiency improvement.
- 7.82 We have also undertaken further work to examine the steady-state issue, which confirms that even if an adjustment is made to reduce the efficiency gap between Network Rail and its peers, a significant gap remains.
- 7.83 The econometric model we have used as the basis of our 'best estimate' of the efficiency gap is in the middle of the range of results, and many adjustments have been made that are ultimately favourable to Network Rail. We have carefully considered Network Rail's response on international benchmarking. However, we do not feel that a robust case was made challenging our work. Our views on international benchmarking remain unchanged. Network Rail has simply criticised our work and offered no credible alternative analysis.
- 7.84 We recognise that some stakeholders may take a different view on this and that, as Dr Pollitt points out, we have been generous towards the company in

⁵⁴ We have also applied a further adjustment for differences in relative wage rates. BSL, in its study for Network Rail, says that average wage rates in Network Rail are 14% higher than the peer group it analysed. If this adjustment is made in addition to the adjustment for renewals volumes the unit cost differential between Network Rail and the average of the peer group (excluding Network Rail) reduces further, to 45%. We have also made a relative wage adjustment to the harmonised maintenance unit costs published by UIC. The harmonised UIC unit maintenance cost differential between Network Rail and the average of the peer group excluding Network Rail is 47%. After adjusting for labour costs, it falls to 38%.

terms of using the results of the ITS work and in making our efficiency judgements. We are content that, on the basis of the econometric analysis, that our view on the overall efficiency gap is not too generous towards Network Rail. This issue is discussed further in chapter 8.

7.85 Table 7.5 summarises quantified results from key quantified benchmarking studies. The range of the efficiency gap given by the various studies lies in a broad range, with a central range of 30% to 50%.

Table 7.5: Summary of key quantified M&R benchmarking results

| Study | Efficiency gap (value / range)* | Comments |
|---|---------------------------------|--|
| ITS international benchmarking (gap at 2006-07) | 43% / 36 – 50% | No steady-state adjustment; to frontier of peer group**; M&R |
| | 40% / 30 – 46% | With steady-state adjustment; to frontier of peer group*; M&R |
| | 42% / 38 – 49% | No steady-state adjustment; to upper quartile of peer group; M&R |
| | 37%*** / 24 – 43% | With steady state adjustment; to upper quartile of peer group; M&R |
| BSL | M: 27% R: 44% | With steady-state adjustment and labour cost adjustment; to average of peer group |
| | M: 50% R: 60% | With steady-state adjustment and labour cost adjustment; to upper quartile of peer group |
| UIC/LICB unit costs (2005) | M: 47% R: 70% | Harmonised unit costs; no steady-state adjustment; to average of peer group |
| | M: 38% R: 45% | Harmonised unit costs; with adjustment for possible rail wage differential and steady-state (relative renewal volumes); to average of peer group |

* The first number shows the efficiency gap against the relevant benchmark (frontier or upper quartile) resulting from the best stochastic frontier method, with the range being generated by applying alternative and simpler efficiency methods.

** Except COLS to upper quartile.

*** Preferred model.

RailKonsult – European best practice study

- 7.86 In order to understand in more detail the differences in the level of cost between Network Rail and European practice, we commissioned a study from RailKonsult.⁵⁵ The objective was to examine which technologies and working methods used in Europe could help account for the differences in the cost gap between Network Rail and the LICB comparators. The study builds on our international visits programme explained above. RailKonsult were also asked to identify only methods which could be applied to Britain and potentially introduced in CP4. The study encompassed consideration of safety issues and also considered the speed at which implementation could take place.
- 7.87 It was not the purpose of the study to identify and analyse all technologies or working methods used in Europe that could be introduced in GB. The study confirmed that several current Network Rail initiatives (such as the introduction of modular S&C and high output plant) have been applied in Europe for several years. It also identified some methods which are currently being investigated by Network Rail, and several others which are not, which therefore provide efficiency opportunities for Network Rail. From a long-list of candidate methods, seven initiatives were chosen for detailed study:
- **asset inspection and asset management.** In general best practice European railways undertake fewer track inspections but inspections are generally of higher quality and are often carried out by inspection train rather than foot patrol. Coupled to a proven and user friendly asset management system, this allows early identification of faults which in turn enables intervention before problems emerge. It is estimated that similar techniques applied in Britain could reduce foot patrolling inspection costs by around 75% and tamping expenditure by 20%;
 - **recycling components.** this is common European practice. In Switzerland, for example, rail, point motors, sleepers and signal heads are regularly refurbished then cascaded from higher to lower category routes. Cascaded rail on lines re-laid with steel sleepers could lead to savings. Additionally ballast cleaning (partial renewal) as opposed to traxcavation (complete renewal) could reduce ballast renewal cost in Britain by 40%;
 - **partial renewal of switches and crossings:** life cycle costs are minimised under European best practice by “second life” processes which replace only the components which are worn out and extend the life of others. Network Rail has recently committed itself to carrying out more partial renewals but European practice could reduce S&C renewal costs in Britain by between 8% and 13% per annum;
 - **high output rail stressing:** stressing continuously welded rail by heating it rather than physically stretching it is a process discontinued in Britain in

⁵⁵ *Review of European renewal and maintenance methodologies – overview*, RailKonsult, May 2008. The overview may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/pr08-konsov-290508.pdf>. Detailed appendices may be accessed at <http://www.rail-reg.gov.uk/server/show/ConWebDoc.9145-consult>.

the 1960s and 1970s. Some European networks (using modern equipment) have re-introduced this method which doubles on-site productivity and, if applied to the renewals re-railing workbank in CP4, could lead to significant annual savings for Network Rail;

- **formation rehabilitation trains:** modern high output European plant is regularly used to undertake formation and also ballast renewals. If applied to Network Rail's CP4 category 7 and 12 track renewals RailKonsult estimate that it could reduce unit costs for both activities by around 40%;
- **lightweight station platforms:** the use of modular construction polystyrene station platforms in the Netherlands could provide opportunities in Britain, given the substantial CP4 platform extension workbank. Analysis suggests a unit cost saving of around 25% in Britain; and
- **use of dedicated teams:** contractors are widely used by most continental railways, as they are in Britain. However there is generally a greater degree of specialisation by activity in Europe (such as S&C renewal or tamping). This ensures a highly skilled and productive workforce dedicated to particular tasks in contrast to the situation in Britain where contractors are often not even dedicated to rail. Whilst this is difficult to quantify, and to a degree this initiative underpins the others, RailKonsult consider that there are real opportunities to improve efficiency in Britain through this initiative.

7.88 We consider that this work provides strong supporting evidence that the cost gap between Network Rail and the comparators in the LICB dataset is due to inefficiency. Most of the practices described in this report are readily applicable to the British railway environment and point towards greater efficiency savings than those projected by Network Rail.

Network Rail's response to RailKonsult

7.89 In its response to our draft determinations, Network Rail sought largely to reject the findings of the work undertaken by RailKonsult. In its response it said that many of the initiatives identified by RailKonsult are already reflected in its plans, that the proposals/calculations made by RailKonsult are flawed and hence not valid, or that the initiatives identified did not offer much new scope for efficiency improvement in CP4. The Network Rail response and the RailKonsult response are summarised below for each initiative.⁵⁶

Asset inspection

7.90 Network Rail said that the SBP already includes greater savings in the inspection activity than assumed by RailKonsult.

⁵⁶ The detailed response by RailKonsult may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/pr08-konsresp-201008.pdf>.

- 7.91 RailKonsult disputes the Network Rail response. The savings identified by RailKonsult relate to three activities. Reduced patrolling accounts for around 55%, less mechanised inspection 15% and less tamping 30%. The initial savings identified were estimated from detailed analysis of only one Network Rail territory, albeit the largest. RailKonsult has not analysed the whole network but would expect network wide savings to exceed Network Rail's planned savings significantly. Similar savings are probably attainable in other areas such as overhead line inspection and maintenance. Overall it considers that there are likely to be greater opportunities in this area than it originally proposed.

Recycling materials

- 7.92 Network Rail said that for some activities such as rail management, defect driven renewal precludes recycling. In other areas, such as the reuse of concrete sleepers, Network Rail says that its practice is "at least as good" as in Europe. Network Rail also said that the RailKonsult study did not include the investment costs of establishing a recycling facility, nor did its analysis account for cascaded rail having a shorter asset life than new material.
- 7.93 RailKonsult remains of the view that recycling of materials by Network Rail is not as extensive as claimed in its response. Recent moves towards re-introducing the practice are welcomed. RailKonsult accepts the principle that recycled rail has a shorter asset life however rail is usually cascaded down to lightly used lines where usage is a comparatively minor driver of asset degradation. In overall terms RailKonsult does not accept that Network Rail currently recycles as much as it claims and, therefore, considers its own assessment of the savings available is valid.

Partial renewal of switches and crossings (S&C)

- 7.94 Network Rail said that "second life" processes such as resin injection of wooden sleepers and use of vacuum plant to reballast S&C would not be cost effective in GB.
- 7.95 RailKonsult says that "second life systems" have been, and continue to be, used by many rail infrastructure managers worldwide. It accepts that Network Rail is planning to increase the amount of partial renewal it undertakes in some activities during CP4. However, it believes that further opportunities should be identified such as reballasting of S&C and that savings greater than those planned by Network Rail are attainable.

High output stressing

- 7.96 Network Rail said that it is already trying this method and remains to be convinced by this approach. In particular, it says, that the practice appears best suited to longer lengths of re-railing.
- 7.97 RailKonsult accepts that the technique cannot be used on all sites. However its own analysis of savings did not include use on high output renewals where

similar benefits would be realised. Additionally a recent innovation in stressing developed in the US, the “super puller”, allows high output techniques to be used on far smaller jobs such as the routine maintenance task of rail defect removal. Therefore while accepting Network Rail's point, RailKonsult believes that additional opportunities do not reduce the overall level of savings it originally proposed.

Formation rehabilitation train

- 7.98 Network Rail said that it does not believe it can justify investing in equipment which will not deliver payback within CP4, though, paradoxically, it accepts that it might be suitable for introduction in CP5. It says that in general RailKonsult has over estimated the extent of its applicability and under estimated its broader introduction and management costs, particularly by excluding Network Rail's overhead cost.
- 7.99 RailKonsult agrees that this machine cannot be used for all ballast work and that formation work is a small proportion of the CP4 workbank. However, as Network Rail accepts in its detailed response, the machine is likely to be suitable for traxcavation type activities as well, where Network Rail itself appears to accept that it could save 20-40% over the current approach. RailKonsult does not understand Network Rail's point that such an investment should pay back in five years. Many other excellent Network Rail investments (such as heavier rail and high output plant) are unlikely to deliver such a quick return.

Lightweight platforms

- 7.100 Network Rail considers that the practice can be applied only to enhancement expenditure and therefore is not relevant for consideration in relation to M&R efficiency projections. It also says that RailKonsult has underestimated the life span of traditional platforms which has led to this product appearing more attractive than it really is. It also says that RailKonsult has not included other station renewal or enhancement cost drivers and has not included Network Rail's overheads.
- 7.101 In RailKonsult's experience station platforms are typically renewed partially or fully after 50 years. Platforms built to last 100 years or more may well be over-engineered. Therefore it believes that its initial assessment of the savings attainable still applies.

Use of dedicated teams

- 7.102 Network Rail says that it has already included benefits of this approach in its modular S&C and “8/200” track renewal initiatives. It says that there are no further opportunities beyond this.
- 7.103 RailKonsult considers that it is important to distinguish between the use of specialist staff and dedicated teams. Nonetheless it is encouraging that this approach is being adopted. However, RailKonsult consider there are many

other repeatable activities that could benefit from this approach, e.g. wet spot removal and rail defect removal. If these are taken into account there are more opportunities to exploit this approach than described in RailKonsult's original report and far more than proposed by Network Rail.

Our view

- 7.104 We welcome Network Rail's response to the RailKonsult study but having carefully considered both Network Rail's response and the RailKonsult reply we have not altered our view that there remains significant scope for improvements in efficiency through learning from or adopting technologies and working practices used elsewhere in Europe.
- 7.105 It is important to note that it is not our role to formulate an alternative business plan for Network Rail – that is the job for the company itself. RailKonsult's work was commissioned primarily to help understand the substantial cost gap uncovered by the LICB benchmarking. Financial estimates were provided chiefly to estimate in overall terms the scale of the benefits to be expected from adopting best practice. In some areas there may well be a lower scope for Network Rail to achieve European best practice performance than RailKonsult estimated, in other areas there will be greater opportunity. RailKonsult only looked at a small number of technologies and working methods from a small number of countries, focusing on track assets. There are likely to be other opportunities applying to other activities and asset categories and we consider that there is substantial scope for Network Rail to deliver efficiency improvements in CP4 by learning and adapting best practice from elsewhere.

Further work by RailKonsult

- 7.106 In order to understand further the differences in principles, priorities and general approach between European best practice and current Network Rail practice, we asked RailKonsult to undertake some further work. This has examined a further four subject areas.⁵⁷ These areas were drawn from the original list proposed by RailKonsult, from which we had previously chosen the seven examples described above.
- 7.107 As was undertaken in the previous RailKonsult study, the review of each working method/technology included consideration of the differences in approach, potential benefits which arise from adopting best practice and any issues associated with implementing the revised approach including identification of safety concerns and timing of implementation. Varying progress has already been made in the introduction of these approaches to Britain. In conclusion, RailKonsult have identified that each initiative could

⁵⁷ *Further assessment of approaches to improve efficiency – overview*, RailKonsult, October 2008. The overview may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/pr08-konsov-201008.pdf>. Detailed appendices may be accessed at <http://www.rail-reg.gov.uk/server/show/ConWebDoc.9145>.

make a material contribution to Network Rail's efficiency if it was widely applied in GB. The four initiatives examined were:

- **enclosed barrier working.** This examined several methods used in France and Switzerland to protect track workers from trains running on adjacent lines. In these cases the equipment provides a mobile and physical barrier, such as a cage or bottomless rail vehicle, which effectively confines track work such as component replacement, wet spot removal or detailed inspection. This removes the need for many large disruptive possessions and allows a more even profiling (and therefore a reduced number) of resources throughout the working week;
- **ballast distribution and redistribution systems.** Best practice ballast profiling and redistribution, as witnessed in Austria and North America, allows a more even distribution of material throughout the system. For example it reduces uneven concentrations and redistributes it elsewhere in place of new material;
- **use of bespoke plant to undertake track renewals.** In Britain most conventional renewals work is undertaken by "road rail vehicles". These are generalist platforms used for a variety of engineering tasks on both the rail and road networks. Such plant is not entirely without merit, but remains a "jack of all trades" limited by size and design to low productivity. Additionally large numbers are required on site with many movements increasing the risk of collision. Best European practice is to use far more bespoke rail plant such as Kirow cranes (which are around four times more productive than road rail vehicles when laying sleepers for example) ballast wagons and specialist switch and crossing equipment; and
- **efficient European re-railing techniques.** This particular study brought together many themes from the previous RailKonsult work by focussing upon the Swiss re-railing method. Bespoke plant, high output welding techniques and dedicated teams are applied routinely. Put together for basic re-railing work alone this method is around 40% more efficient than current Network Rail practice.

International possessions benchmarking

7.108 In 2006 we commissioned Lloyds Register Rail to undertake an international study to compare Network Rail's efficiency of possessions use with a number of overseas rail infrastructure managers.⁵⁸ The study examined different approaches to possessions management, the amount of time used to set up/hand back isolations and the time used at the start and end of possessions. The study found that there are many areas where overseas practice is more efficient than Britain.

⁵⁸ *Possession benchmarking exercise: Report for Office Of Rail Regulation, Lloyds Register Rail, September 2006.* This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/possessions05-llr.pdf>.

- 7.109 Amongst other things, other railways have greater amounts of effective time in a possession, which is supported by higher levels of mechanisation. Other countries make more use of single line working, although this is generally easier than in Britain given more space and the prevalence of bidirectional signalling. The consultants highlight that there is a widespread view in Britain that there is little appetite for single line working as it seen to be too difficult. However Network Rail's recent use of the high output track renewals machinery has shown that it can work. Since the Lloyds Register Rail study was completed, and under Network Rail's proposals for the seven-day railway, single line working will need to become widely used on the network. Better work planning was also highlighted as an area for potential improvement, in order to better align the work required with the possession time that is booked.
- 7.110 We recognise that Network Rail is making improvements in terms of improving its efficiency in these areas, and there are examples where Network Rail's efficiency is as good as, or better, than the overseas comparators, but overall this study backs up other evidence that shows that Network Rail is not efficient as best practice overseas, which provides opportunities for further improvement.
- 7.111 Network Rail noted the conclusions of this work in its SBP and said that it would consider the findings of the work in the context of its possessions planning and the development of the seven-day railway concept in CP4.

EWS efficiency studies

- 7.112 This section deals with the efficiency studies sponsored by EWS. Both Network Rail and ourselves consider them to be useful contributions to this Review.⁵⁹
- 7.113 In late 2006 EWS commissioned LEK and TTCI to benchmark Network Rail's costs with the highly efficient privately owned railroads in North America. Since the characteristics of the networks and their usage are different a number of adjustments were made in order to normalise the comparison of relative efficiency. The adjustments addressed differences in tonnage, axle load, linespeed, standards, local input prices and performance regime payments. The net effect of the adjustments was roughly to double the unadjusted Class 1 permanent way and structures costs to put them on an equivalent basis to Network Rail's cost base. The study found that:
- since de-regulation in 1980 the US railroads have achieved on average around 4-5% efficiency improvement per annum;
 - US variable costs were between 1.8 and 2.7 times lower than Network Rail's, after the various adjustments were made; and

⁵⁹ Much of the work commissioned by EWS is summarised in a response to our consultation on freight charges as part of PR08 and submitted to us on 29 January 2007. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/310-EWS-290107.pdf>.

- US average costs were between 3.3 and 5.1 times lower than Network Rail's freight only line cost after the various adjustments were made.

7.114 Network Rail did not provide any further response to this work in its draft determinations response, having provided a response in its SBP. In its SBP Network Rail said that it was generally not convinced that this was a worthwhile comparison, arguing that there are such significant differences between the respective networks as to make this type of benchmarking invalid. In particular it cited that generally lower train frequency on the North American networks allows far more working between trains and therefore the need for fewer expensive possessions. However Network Rail does recognise the potential to learn from best practice in North America. Following discussions with Network Rail on this work, we have agreed with the company to carry out more detailed benchmarking on specific comparable lines in Britain and North America.

7.115 We recognise that there are significant differences between the GB and North American networks but consider that LEK and TTCl made extensive adjustments in order to normalise the data. We believe that there must be lessons that can be learned from year after year of continuous productivity improvement, many of which are also identified in the Abbott review (discussed below).

Abbott review

7.116 Brian Abbott is a senior Canadian railway engineer engaged jointly by EWS and Network Rail to identify efficiency opportunities for CP4. His work is based upon a series of site visits conducted in October 2006. The main findings of his review are:

- Network Rail has made excellent progress in investing in some modern plant and, especially, in developing future engineering talent;
- there is evidence that track assets are being renewed prematurely;
- there is insufficient focus on preventative maintenance and partial renewal of assets;
- there is insufficient investment in increasing the reliability of older plant (especially tampers and ballast cleaners) which leads to doubling up on many jobs;
- many individual jobs are treated inappropriately as large scale projects rather than routine railway renewals;
- there is an imbalance in Network Rail staffing levels which places too much weight upon support staff and insufficient emphasis on delivery;
- there is opportunity to recycle track components; and
- there is much time wasted in possessions. Savings can be achieved simply by reducing the length of most possessions.

7.117 Overall, he concluded that there is tremendous scope for improvement in productivity.

7.118 In our discussions with Network Rail, and in its SBP update, the company accepted some of the conclusions from Brian Abbott's report but disputes many others. Its response can best be characterised as:

- acceptance that renewals possessions are too long. It intends to standardise 16 hour possessions in CP4 rather than the possessions of 54 hours witnessed by Abbott. However it does not necessarily agree that this will result in efficiency savings;
- agreement that there is scope to reduce the dead time in taking and releasing possession of the line. A new protection system, based upon Canadian practice, is being introduced. However it does not necessarily agree that this will result in efficiency savings;
- the CP4 workbank now includes some partial renewal of S&C (as discussed in chapter 5);
- a study on the appropriate balance between delivery and support staff is underway. However it does not anticipate sizeable scope for head count reductions;
- further work needs to be done improving the reliability of contractors' plant. However the contractual structure allows the cost of redundant plant to be discounted; and
- it believes that differences in linespeed, hand back speed and track quality limit the potential for Canadian experience to inform this review. In particular higher track quality standards limit the scope for asset life extension measures and it does not accept that assets are renewed prematurely.

7.119 Network Rail did not provide any further comment on the Abbott review in its response to our draft determinations.

Our view

7.120 We accept Network Rail's view that there are characteristics and performance requirements of the British mixed railway network which prevent the achievement of all the Canadian best practice efficiencies. However the Abbott study has highlighted many sources of potential future efficiency savings. These are:

- **length and management of possessions:** we welcome Network Rail's intention to reduce renewals possession length. However we believe that it is reasonable to expect shorter take up and release times and the general reduction in the number of shifts required to deliver efficiencies in many cases;
- **renewals scope:** we welcome the move towards partial renewal of assets on appropriate routes;

- **distribution of staff:** Network Rail has improved its asset management and we also expect to see a more standardised approach and the introduction of modular S&C renewals in CP4. Taken together this could allow scope for a down-sizing of projects and could allow scope for a corresponding reduction in support staff; and
- **redundant plant:** we believe that retaining redundant plant is generally an inefficient practice and addressing this should provide further opportunities for cost savings.

Lloyd's Register Rail track renewals efficiency study

7.121 EWS commissioned Lloyd's Register Rail in early 2007 to examine ways to increase track renewals efficiency in CP4. It was based upon adoption of current and previous British methods and adoption of some elements of European best practice. The findings of the study were:

- a new method of plain line renewals based upon use of Kirow cranes and Slinger trains could reduce track renewal unit cost considerably. When applied to unit costs and a workbank from the Western territory, savings of 33% were attainable;
- partial renewals of S&C is currently applied inconsistently across territories. A standardised approach, based upon best practice methods, could reduce S&C renewals costs;
- adoption of modular S&C methods could save around 40% of total S&C renewals spend; and
- all these savings could be realised within two years.

7.122 While broadly supportive of the work, several significant reservations were expressed by Network Rail in discussions and in its SBP update. These were:

- Lloyds Register's efficiency estimates were based upon analysis of one territory's workbank. When other territories' workload and costs, as well as the high output programme, were taken into account savings reduce considerably;
- Lloyds Register's efficiency estimates were based upon historic cost levels, levels which will have reduced significantly by the end of CP3; and
- Lloyds Register's analysis excluded the costs of rail haulage.

7.123 When adjustments were made and the method applied across the whole country, Network Rail consider that the efficiency savings implied by this study are very close to its own 'pre-stretch' CP4 estimate of 9% for plain line renewals and 10% for S&C renewals.

7.124 A detailed workshop was held with EWS and its advisers, Network Rail and engineering experts from its contractors and ourselves. This identified several more factors which precluded the Lloyds plain line renewal method being introduced, such as axle load restrictions and the working of engineering trains within lines under possession.

7.125 We are encouraged by the positive attitude adopted by Network Rail towards these proposals and see this as an excellent example of co-operation within the industry. Our views are:

- we accept that the plain line savings identified cannot necessarily be applied across the entire network especially with a greater work load being planned for high output machines. However we remain concerned that difficult locations (e.g. sites with stations, electrification, limited access or clearance) can reduce the efficiency expected by such a large margin. We intend to work with Network Rail to understand better the method used to quantify the additional cost of working in such locations;
- Network Rail's claim that many of the efficiency savings identified by Lloyds Register have already been made in CP3 also requires further explanation. To date in CP3 Network Rail has not achieved the efficiency targets on track renewals. Moreover, it is not apparent how the savings which have already been made have been achieved. For example if they have arisen by reducing procurement prices, then they will not necessarily limit the scope for efficiency improvement proposed by Lloyds Register through its "method of work" productivity analysis; and
- we are encouraged to see a greater number of partial renewals planned for CP4.

7.126 Network Rail did not provide any further comment on the Lloyds review in its response to our draft determinations.

Asset management benchmarking

7.127 In 2006-2007, the independent rail reporters AMCL undertook a 'best practice' benchmarking study of Network Rail's asset management.⁶⁰ The study concluded that Network Rail's asset management 'is at least comparable to that of other major infrastructure owners in the UK', but that further development of optimal asset policies could 'deliver significant savings in both capital and operational expenditure'. AMCL pointed to examples in other rail infrastructure managers and regulated sectors where significant efficiencies have been achieved, through the application of rigorous whole life cost and risk analysis, with no increase in risk. For example, in maintenance, it highlighted work undertaken by Tube Lines where benefits of up to 20% were identified from the application of risk based maintenance techniques.

7.128 Network Rail did not provide any further comment on this work in its draft determinations response, having commented on it previously.

⁶⁰ *Independent Reporter Part C Services: Best Practice Review - Final Report Using the AMCL Excellence Model™*, Asset Management Consulting Limited, 6 February 2007. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/exp-amcl-060207.pdf>.

Track productivity benchmarking

- 7.129 In September 2008, further to its draft determinations response, Network Rail submitted to us preliminary results from its own high level project benchmarking its contractors' productivity for five key tasks against a selection of contractors working in Germany, Sweden, Austria and the Netherlands. It believed that by concentrating upon specific productivity (as expressed in metres per hour) rather than by applying financial analysis, it would remove uncertainties over materials prices and wage rates. It divided its results into both peak and average outputs for both conventional and high output methods.
- 7.130 Because the project is in its infancy the data provided is far from complete. For example in only one instance was an average output available for use of its own high output plant and no high output data for the Netherlands was provided at all. Network Rail stated that conventional methods are little used among its comparators, and are mainly applied for particularly awkward jobs such as renewing track in stations. It acknowledged that some adjustment should be made for this.
- 7.131 The conclusions that Network Rail drew from the work were that it is more productive than the peer group for a range of high output renewals activities and significantly more productive for conventional renewal activities. For instance, it considers that it is 8% more productive on high output track renewal and 240% more productive on conventional track renewal.

Our view

- 7.132 We welcome Network Rail's work in this area. We have not had the time to examine the work in detail and we have only been able to give it an initial review at this stage. However, it is difficult to draw conclusions from this type of work in terms of overall efficiency. Unlike the LICB benchmarking work this benchmarking deals with a limited amount of data on an unspecified definition of each activity for a few contractors over a short period of time. This leaves considerable room for interpretation. For example if we accept that track renewals are primarily carried out by high output methods in Europe and by conventional methods in Britain, then an analysis of typical productivity for the different methods would tell a different story, with Network Rail being significantly less efficient than the peer group. For example, it is significantly less productive when comparing conventional methods in GB to high output methods in the peer group.
- 7.133 Ultimately, whilst this sort of analysis is useful it does not replace financial based benchmarking, since this will provide a comparison of the total resources each railway deploys to achieve its output. For example railway A may deliver more in a given time than railway B but deploy more labour and capital to achieve it, i.e. that the unit costs are higher. Overhead costs are also not part of this productivity analysis. The LICB benchmarking work dealt primarily in financial figures and applied adjustments to correct for broader economic and network capability factors.

- 7.134 It is not clear how representative the activities of a small number of contractors are to overall system productivity. The LICB benchmarking considered long run spend profiles allowing a better informed whole system perspective. It did not draw from a small amount of data from a small pool of contractors, although this sort of focused work is useful to underpin the wider benchmarking work.
- 7.135 We are encouraged that Network Rail can appear to match and even surpass its comparators in the use of high output plant in the information provided, although it uses far less high output plant than its peers. In itself the comparison of the use of high output equipment is evidence of the benefits Network Rail might expect to achieve from studying and applying European best practice on a broader scale. We are also pleased that Network Rail has instigated this programme. We believe it will prove useful in identifying future areas of best practice which can be used by Network Rail to target future efficiency improvements.

Efficiency benefits of unsupported debt

- 7.136 We asked NERA in 2006 to consider the efficiency benefits that might be expected through the stronger corporate financial incentives introduced by restricting the government guarantee of Network Rail's debts and the company then having to raise unsupported debt.⁶¹ NERA found evidence that capping the FIM should strengthen incentives to improve efficiency, and suggest that this could increase efficiency by 0.5% pa, although there was inevitably a significant degree of judgement in coming up with this finding. Network Rail has not challenged the results of this work.

Oxera study on opex efficiency

- 7.137 As part of our work to examine the scope for efficiency improvement in CP4, we commissioned Oxera to assess real unit operating expenditure improvements across a range of regulated utilities, and the scope for frontier shift (covering OM&R). Network Rail claims that Oxera used inappropriate comparators and made some spurious adjustments to the data in developing its range. Network Rail commissioned LECG to review Oxera's work and produce its own view of the range for real unit operating expenditure trends. Network Rail also commissioned Horton 4 Consulting to review Oxera's proposals for total factor productivity improvements, with Horton 4 Consulting saying that TFP in the railway industry is no greater than in the economy as a whole.

⁶¹ *Corporate Form, Financial Guarantees, and Efficiency Performance: Expectations and Evidence*, NERA, December 2006. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/pr08-isbp-nera.pdf>.

7.138 In 2005 we engaged LEK Consulting and Oxera to undertake a preliminary assessment for us on the scope for efficiency improvement in CP4.⁶² The consultants estimated that Network Rail could make efficiency savings of up to 8% per annum in each year of CP4, based on actual experience from other regulated sectors, from experience in North America and taking into account the sharp increase in costs that Railtrack/Network Rail experienced after the Hatfield accident and actual and expected progress in CP3. We used the results of that study to inform both our initial assessment of the CP4 revenue requirement that we published in December 2005 and our advice to ministers on the revenue requirement that should be assumed to deliver the HLOSs, which we published in February 2007.

7.139 At the end of 2007 we asked Oxera to update this work, focusing on further evidence of efficiency improvements in other sectors and giving particular attention to the efficiency improvements possible in operating expenditure. Oxera examined the reductions in real unit operating cost expenditure (RUOE) for the water industry (including Scottish Water), electricity distribution, gas distribution, National Grid and BT for the various periods since these companies/industries were privatised.⁶³ As part of this work we also asked Oxera to consider the scope for improvements in the efficiency frontier (frontier-shift). Table 7.6 shows key results from Oxera's study.

Table 7.6: Results of Oxera study on the scope for CP4 efficiency improvement

| Results | Efficiency improvement (% per annum) |
|---|---|
| Real unit operating cost expenditure (note 1) | |
| <ul style="list-style-type: none"> • Range from other sectors • Central range from other sectors • 'Reset' hypothesis (note 2) | <p style="text-align: center;">1.7 – 14.3</p> <p style="text-align: center;">4.0 – 6.2</p> <p style="text-align: center;">5.2 – 6.8</p> |
| Total factor productivity (net of economy TFP) (note 3) | |
| <ul style="list-style-type: none"> • Opex • Maintenance • Renewals | <p style="text-align: center;">0.2</p> <p style="text-align: center;">0.9</p> <p style="text-align: center;">0.9</p> |

Notes: (1) RUOE will include total factor productivity improvement but exclude any adjustment for input price growth. (2) The reset hypothesis developed by Oxera assumes that the Hatfield accident, the resulting increase in unit costs and the takeover of Railtrack (in administration) by Network Rail is akin to the position that utilities typically found themselves in at privatisation, and as such CP3 is equivalent to the first control period after privatisation. (3) In applying these TFP estimates we have assumed a lower amount for maintenance and renewals (60%) of Oxera's estimate as a prudent

⁶² *Assessing Network Rail's scope for efficiency gains over CP4 and beyond: a preliminary study*, LEK Consulting and Oxera, December 2005. This may be accessed at http://www.rail-reg.gov.uk/upload/pdf/lek-ox_cp4effgns.pdf.

⁶³ *Network Rail's scope for efficiency gains in CP4*, Oxera, April 2008. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/pr08-oxeraeffic-160408.pdf>

value to account for the possible double counting of productivity improvements in the TFP estimates and in the input price estimates produced by LEK for Network Rail (discussed further in chapter 8).

7.140 Oxera's analysis highlights that other regulated sectors continue to achieve significant efficiency improvements many years after privatisation (above what might be expected from ongoing productivity improvements/frontier-shift). Catch-up does not appear to have fully worked through before at least 15 – 20 years following privatisation.

7.141 Based on its analysis, Oxera advises that the actual assumption we choose to factor into access charges depends on the current efficiency level of Network Rail compared with other utilities, and that evidence suggests that there is still a significant gap to best practice. Oxera set out a spectrum of possible efficiency 'targets' for Network Rail, which is shown in figure 7.3.

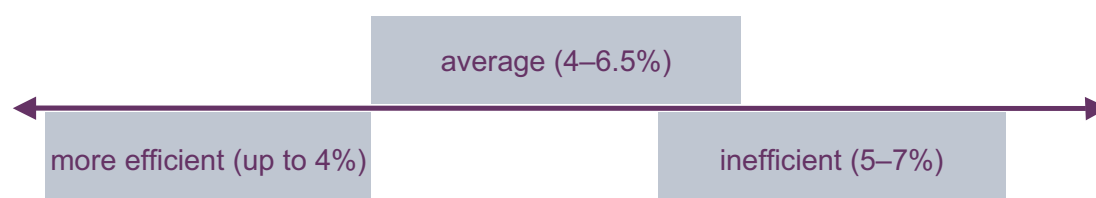


Figure 7.3: Possible efficiency targets for Network Rail in CP4 (% per annum)
(source: Oxera)

Network Rail's response to the Oxera study

7.142 Network Rail commissioned LECG to review LEK/Oxera's 2005 study as part of its SBP update. We welcome this contribution to the efficiency debate and the review of the 2005 study – although it is important to note that the 2005 study was only ever a preliminary assessment of the scope for efficiency improvement in CP4 and not a study that is having a direct bearing on our judgements for CP4, and it has been superseded by Oxera's update (summarised above).

7.143 LECG's report sets out a range of criticisms of the LEK/Oxera study. The main criticism is the selection of the comparator set. LECG say that BT should be removed from the analysis, and Royal Mail as well as BAA included as comparator companies to Network Rail. Oxera's updated study addresses the merits of including or excluding different comparator companies. We would however note that Royal Mail is far less capital intensive and has a much lower share of fixed costs than Network Rail and we would therefore question its inclusion in the analysis.

7.144 LECG made some adjustments to the assumptions LEK/Oxera employed and alterations to the companies included in the analysis. As a consequence of

these adjustments, LECG finds that the average real unit operating expenditure improvement for the range of sectors since their privatisations is 3.2% per annum (in a range of 1.6% per annum to 5.7% per annum). Oxera reviewed the LECG work as part of its study but did not change its results as a consequence of this.

7.145 As part of its response to our draft determinations, Network Rail submitted an updated report from LECG. This develops further the criticisms it raised in its initial review and LECG provides its view on the central range of RUOE efficiency improvements, of 2.1% per annum to 4.0% per annum with an average value of 2.8% per annum.

7.146 We asked Oxera to review the new criticisms made by LECG.⁶⁴ Oxera still considers the comparator set to be appropriate for Network Rail after undertaking further sensitivity tests in response to LECG. Oxera does not consider that including Royal Mail or BAA in the peer group is appropriate, as they do not own and maintain a physical network as other infrastructure utilities do. Oxera concludes that the central range of 4.0% to 6.2% efficiency improvement per annum initially presented in their report remains robust.

7.147 Network Rail also commissioned Horton 4 Consulting to review Oxera's work on RUOE and TFP, which Oxera included in its review. Horton 4 Consulting argues that using continental Europe, rather than the UK, makes for a better comparison of TFP. On RUOE, Horton 4 Consulting claims that rapid technological change as well as abnormally high productivity growth skews the results, and that the lower end of Oxera's range is more plausible. Horton 4 Consulting also says that Oxera does not conclude that the opex efficiency gap is 35%, and that there is likely not to be much further room for opex efficiency improvement based on Network Rail's past performance.

Our conclusions on RUOE and TFP

7.148 We welcome the large amount of effort that has been put into the debate surrounding TFP and RUOE. Network Rail's submission has helped inform our views on efficiency, and we feel that the robust debate has added confidence to our conclusion. Our views on operational expenditure efficiency remain unchanged from our draft determinations. It is important to emphasise that our assumed level of annual opex efficiency improvement 3.5% was within LECG's central range and below Oxera's central range.

Historical comparison of opex

7.149 We have examined Network Rail's performance in CP3. In its SBP Network Rail said that it expected to make efficiency savings in its controllable opex of 31.6% (net of input price effects). The average saving in CP3 is expected to be 7.2% per annum (net of input price effects) and average savings in the last two years of CP3 are expected to be 4.6% per annum (again net of input

⁶⁴ *Response to LECG's review of Oxera's 2008 report to ORR*, Oxera, October 2008. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/pr08-oxresp-271008.pdf>.

prices). Network Rail's net assumption for CP4 is opex savings of 1.5% pa. This is nearly five times less than Network Rail achieved on average in CP3. Network Rail has not adequately explained to us why the rate of change reduces so much from CP3 to CP4.

- 7.150 Figure 7.4 shows the trend in Railtrack's/Network Rail's opex since privatisation. Trend lines are overlaid for the level of controllable opex that would have been achieved if the real unit opex reductions experienced in other regulated sectors were achieved by Railtrack/Network Rail. These trendlines are drawn from the results of the work by Oxera and LECG discussed above. Figure 7.4 updates the trendlines shown in our draft determinations. In its response to our draft determinations Network Rail reproduced our figure and included its own view on the trend. This was based on LECG's calculated rate of efficiency improvement (2.8% per annum) and it also assumed that of the c.£400m per annum increase in controllable opex following the Hatfield accident around £220m of this can be fully justified.
- 7.151 In our assessment in our draft determinations we explicitly did not adjust for additional obligations and output growth by Network Rail, given uncertainty over this. We did not consider that this would have a major impact on our analysis. We have reviewed Network Rail's explanation and consider that only £105m of the increase in costs is justified. We have adjusted the start point accordingly.
- 7.152 In our updated version of the figure we have also included Oxera's central value on RUOE improvement of 5% per annum rather than the conservative value of approximately 4% we used in our draft determinations.
- 7.153 The figure shows that at the end of CP3, the gap between Network Rail's controllable opex and the trend lines from other sectors lies in the range of 23% to 43%. The lower end of this range is driven by LECG's central estimate of 2.8% per annum improvement in RUOE. On this basis we consider that our estimate of a 35% efficiency gap at the end of CP3 is reasonable. The figure shows the adjusted start point for the LECG and Oxera trendlines based on the £105m adjustment.

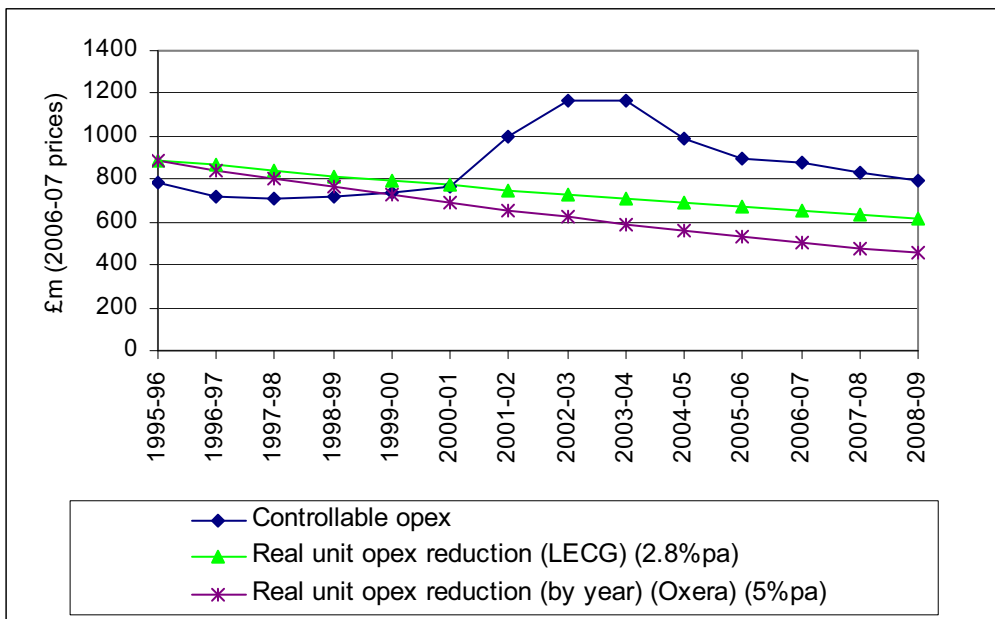


Figure 7.4: Actual and projected opex by Railtrack/Network Rail since privatisation (with regulated sector trends from LECG and Oxera)

Assessment of operations costs

7.154 We commissioned Winder Philips to report on the efficiency of Network Rail's operations costs, which includes: signallers/level-crossing keepers; train planners; delay attribution; control; operations and customer services; operations delivery; and opex at the major stations. Operations costs in the SBP for 2007-08 account for around £330m per annum out of Network Rail's total controllable opex of around £815m per annum. (Network Rail forecast in the SBP to reduce operations costs to around £300m per annum by the start of CP4.)

7.155 The main findings of the study are that Network Rail's forecast for operations costs in the SBP are not robust and that Network Rail has significant scope for making additional efficiency savings above its proposals in the SBP. Winder Phillips identify potential savings (in addition to those identified by Network Rail in the SBP) in operations costs in CP4 of around £34m per annum (11% of the annual operations costs projected in the SBP). These savings largely cover the scope of work and do not cover unit cost efficiencies. Key opportunities for efficiency improvement that Winder Phillips identify include: taking account of operations costs when making signalling renewal decisions; improving coordination between the corporate centre and the operational centres; making more sophisticated use of internal benchmarking to identify cost saving opportunities; and assuming that some savings identified by Network Rail in the supporting documents to its SBP can be achieved earlier in CP4 than Network Rail had assumed. We have shared this report with Network Rail and further discussed the findings with it.

7.156 Network Rail's response agreed with a number of these initiatives and proposed that Network Rail could reduce costs by £89m in CP4 (an average of £18m pa). The main difference between the Winder Phillips report and Network Rail's response is that Network Rail consider some of the savings will take longer to achieve than Winder Phillips do even though the Winder Phillips report was cautious on the pace of change. Network Rail's response also identified some initiatives that would reduce costs by £19m that were not included in the Winder Phillips report. Network Rail's information management related expenditure for its operating strategy is additionally expected to reduce operations costs by £20m by the end of CP4.

Total employment costs

7.157 We commissioned Inbucon to undertake a top-down benchmarking assessment of Network Rail's total employment costs, by broad category of employee, against a range of external pay benchmarks. These external benchmarks include the Incomes Data Services pay benchmark, the Watson Wyatt manufacturing, distribution and services sector survey; the EEF Management and Professional Engineers Pay Survey; and Inbucon's own remuneration database. The consultants also took into account Network Rail's own benchmarking studies. Inbucon analysed £1.2bn of costs, covering base salary, allowances, overtime and bonuses, covering all of Network Rail's 34,500 employees.

7.158 Inbucon considered that whilst Network Rail's own benchmarking studies were not unreasonable, they did not cover all of the compensation package (such as pensions) and, as such, do not provide a complete picture. The main findings of Inbucon's study are that total employment costs at Network Rail are between 15% and 20% greater than the external market benchmarks. As with the operations cost study, we have shared this report with Network Rail.

7.159 Network Rail's response suggested that Inbucon should not have included overtime in their comparison without adjusting for the extra time worked. We do not think Network Rail's response is appropriate given:

- Inbucon's study was high-level. If an adjustment is made for time worked then an adjustment should also be made for the quality of the work. Adjusting for both of these effects would require more detailed analysis that was beyond the scope of the study; and
- Network Rail's staff are contracted to work 35 hours a week. This is below normal levels in other organisations so adjusting for this effect would put Network Rail at a relative disadvantage in the benchmarking analysis. Therefore, we do not consider that it is credible for Network Rail to suggest adjusting for the time worked as overtime without also adjusting for variances in the basic working week. Inbucon considered this in their report and decided that no adjustments were needed. However, given Network Rail's concerns we asked Inbucon to recalculate the differential between Network Rail and the benchmarks. In doing this, Inbucon adjusted for both overtime worked and the difference in the basic working

week. Overall this shows that the difference between Network Rail and the peer group is even greater than the original Inbucon findings.

Insurance

- 7.160 Network Rail's forecast net operating expenditure on insurance in CP4 is some £90m per annum, around 12% of its controllable opex. We commissioned Heath Lambert to review Network Rail's SBP proposals.
- 7.161 Our approach to making an assumption on the efficient level of insurance costs needs to be consistent with our overall package for CP4, in particular in relation to the treatment of risk and uncertainty. In essence, we need to consider what risks are being protected and how they are protected and whether this represents an efficient approach. Our assessment highlights that some of the risks the company insures against are already being accounted for elsewhere in the determination.
- 7.162 Heath Lambert's findings are that Network Rail can make substantial savings in its insurance costs. These savings can be divided into two areas:
- Network Rail is including in its forecast of insurance costs the cost of covering risks that are already covered elsewhere in our PR08 determination, e.g. business interruption costs – this gives savings of £26m per annum;⁶⁵ and
 - savings due to the consultants taking a different view of the appropriate future estimated efficient claims costs and premium payments (£8m per annum). This is because Network Rail's projections of future liabilities are not adequately justified especially when compared to historic claims.⁶⁶
- 7.163 We have shared Heath Lambert's report with Network Rail. Its response was that it did not think that it could achieve £8m of efficiencies by improved claims handling and increased policy excesses. The issue of claims handling and policy excesses which is made in Heath Lambert's report referred to potential changes to Network Rail's insurance arrangements that could achieve efficiencies. The main efficiency savings identified by Heath Lambert do not rely on claims handling and increased policy excesses, instead the main difference between Network Rail's and Heath Lambert's views is that Network Rail's future estimated efficient claims costs are not consistent with actual claims experience.

⁶⁵ Heath Lambert's initial estimate of the business interruption adjustment was £41m. Network Rail considered this was too high. We assumed £30m for the draft determinations and have revised it to £26m following discussions with Network Rail.

⁶⁶ This efficiency saving could be higher but Network Rail have not provided us with the appropriate supporting information to justify the assumption it has made on public and product liability. Therefore, it is difficult to determine how much public and product liability cover is needed for an efficient company in CP4. Given the methodology used by Network Rail the efficient level is likely to be substantially below their forecast.

7.164 Network Rail has confirmed that the new insurance arrangements it entered into in 2008-09 will achieve £10m of savings per annum (in 2006-07 prices) and a better programme. Network Rail has also confirmed that it had incorrectly included business interruption costs in opex, which it has estimated at £25m. Following our discussion with Network Rail we have revised our estimate of the business interruption adjustment to £26m.

Drawing together the key evidence on the scope for efficiency improvement

7.165 As this chapter has set out, there is a wide range of evidence drawn from a variety of studies derived using different approaches, that highlights that Network Rail faces a significant efficiency gap in OM&R at the end of CP3 (excluding any ongoing frontier-shift). Network Rail itself accepts that there is significant scope to improve efficiency, albeit it does not put a value on this.

Maintenance and renewals

7.166 For M&R the evidence, including the results of our econometric analysis of the LICB dataset, our analysis of the smaller group of countries at the sub-national level and the BSL study, point towards an efficiency gap in the range of 30% to 50% or more. We consider that the result of our econometric analysis of the LICB dataset, showing a gap of 37% for M&R (based on the preferred model from the econometric analysis), represents a robust, but conservative calculation. The gap calculated using the LICB dataset is for 2006.

7.167 Whilst we have placed a reasonable degree of reliance on international benchmarking, our calculation of the gap is supported by a wide range of further evidence, including our detailed assessment to normalise infrastructure costs between countries, the detailed engineering work carried out for us by RailKonsult, the international possessions benchmarking study carried out by Lloyds Register Rail and the asset management benchmarking study carried out by AMCL. We recognise that there are some uncertainties and overlaps across these studies, but the breadth of evidence we have and our conservative approach in using the results is a strong basis for calculating the efficiency gap Network Rail faces. Our assessment is also backed up by the further work we have undertaken to adjust for steady-state levels of renewals expenditure.

7.168 In its draft determinations response, Network Rail has criticised the apparent “mechanistic” reliance on the international benchmarking results in drawing our conclusions on the scope for efficiency improvement. As we have clearly set out and explained in this chapter, we have conducted a wide range of work to understand the scope for efficiency improvement. This work all points towards a significant efficiency gap. We need to select a value to use as our estimate of the efficiency gap. As we show, there is a range of results which indicate the gap is between 30% to 50%. Given the general robustness of the econometric analysis and that the results of the preferred model are within a range of results that, if anything, are at the lower end of the overall range of

estimates for the efficiency gap, we consider that it is reasonable, transparent and prudent to adopt the 37% value from the preferred model as our estimate for the efficiency gap for each of maintenance and renewals in 2006-07.

7.169 We have rebased the gap to the end of CP3 by subtracting the efficiency that Network Rail expected to achieve at the time of its SBP update for maintenance and renewals in 2007-08 and 2008-09, less frontier shift (since we consider it appropriate to expect the peer group to improve its efficiency over this period).⁶⁷ For maintenance the resulting efficiency gap is reduced to 31% and for renewals it is reduced to 36%. (As we discuss in the following chapter, we have not updated this for the worse outturn position now expected.)

Controllable opex

7.170 For opex, the study Oxera carried out for us has shown that other regulated utilities have achieved, over an extended period, efficiencies averaging 4% to 6.2% per annum. Our updated analysis of historical controllable opex using 2.8% per annum (from the LECG study for Network Rail) as a lower bound and 5% per annum (the approximate central point in the Oxera range) as an upper bound, and taking into account our reasonable adjustment for justified post-Hatfield cost increases (of £105m) gives an efficiency gap at the end of CP3 that ranges between 23% and 43%. On this basis we consider that our estimate from the draft determinations, of 35%, remains robust. Our bottom-up assessment of insurance, total employment costs and the operations function confirms that Network Rail faces a significant efficiency gap at the end of CP3.

⁶⁷ Network Rail included in figure 2 on page 2 of its SBP its actual and forecast CP3 efficiencies. It provided us with a revised version of this with its SBP update.

8. The overall scope for OM&R efficiency improvement in CP4

Introduction

- 8.1 This chapter sets out our assumptions for the efficiency improvements we consider Network Rail can make in CP4, which we have factored into our calculations of the company's revenue requirement. It builds on the explanation of the work to assess efficiency in the preceding chapter.
- 8.2 The chapter is structured as follows:
- our assessment of the efficiency gap at the end of CP3 is summarised;
 - our treatment of input prices is set out;
 - our draft determinations judgements on efficiency improvement are summarised;
 - the key issues raised by Network Rail and other respondents to our draft determinations are discussed; and
 - our judgements on efficiency improvement for CP4 are set out.

The efficiency gap at the end of CP3

- 8.3 The previous chapter set out our assessment of the efficiency gap between Network Rail and its peer group (excluding frontier-shift or any adjustment for input prices), and the rebasing of this gap (for maintenance and renewals). To recap, at the end of CP3 we consider the efficiency gap (based on conservative assumptions) that Network Rail faces to be:
- controllable opex: 35%;
 - maintenance: 31%; and
 - renewals: 36%.
- 8.4 Although Network Rail has reduced its forecast for its efficiency improvement in 2008-09 (compared to its SBP update), and hence all other things being equal the efficiency gap would show a small increase, we are not making any changes to our estimates of the efficiency gap at the end of CP3.

The treatment of input prices

- 8.5 We set out in our advice to ministers in February 2007 that, at that stage, we were minded to let Network Rail continue to bear the risk of inflation in input prices in CP4 (above that reflected in RPI) because it is at least partly controllable by the company and the regulatory framework provides various protections to deal with cost shocks. However, we also stated that our final

decision on this issue would depend on the materiality and controllability of the anticipated input price pressures in CP4.

Network Rail's submission

- 8.6 Network Rail submitted to us a detailed quantified assessment of the input price pressures it expects to face in CP4, undertaken by LEK Consulting.⁶⁸ Network Rail updated its input price study as part of its SBP update, but the difference in the values was small and, given the general uncertainty around the input price projections, Network Rail did not make any changes to its expenditure projections for this.
- 8.7 The LEK report set out that over CP3 the company has experienced overall input price inflation (above RPI) for OM&R of around 1% per annum and it forecasts a similar level of 1% per annum going forward into CP4 (in a range of around -1% per annum to more than 3% per annum). The central estimate for average annual CP4 input prices for opex are 1.6% per annum, for maintenance 1.3% per annum and for renewals around 0.75% per annum.

Our view

- 8.8 We recognise that the issue about the level and treatment of input price inflation has increased in importance over recent years. In recent regulatory reviews, regulators have tended to make specific adjustments to the efficiency target set for regulated companies where input costs are forecast to rise above RPI.
- 8.9 We welcome the extensive work that Network Rail has put into this issue and its original study and update. The work represents an important contribution to the efficiency debate. We are also grateful for the work that RIA has undertaken; we have taken their views as well as Network Rail's into consideration in reaching our decision on the treatment of input prices.
- 8.10 Our work on input prices has principally focused on examining the assumptions that LEK used in its report, exploring the accuracy of the RPI forecasts, considering regulatory precedent and analysing independent forecasts of input price inflation. We had a number of useful meetings with Network Rail and LEK throughout this process.
- 8.11 We have considered the treatment of input prices in the context of the overall package, since Network Rail will benefit from a range of protections against unforeseen cost or revenue shocks in the CP4 price control framework, which may be caused or exacerbated by input price inflation. These include the risk buffer and the re-opener provisions.

⁶⁸ The input price study that Network Rail submitted to support its SBP may be accessed on Network Rail's website at www.networkrail.co.uk/browse%20documents/StrategicBusinessPlan/Other%20supporting%20documents/LEK%20input%20price%20report.pdf.

- 8.12 We do have some concerns that LEK's analysis identifies that both a substantial part of the historic potential input price inflation experienced and the projected input price forecast for CP4 is due to labour cost inflation. LEK do not explain how much of the increases are due to an ability by management to moderate wage growth (e.g. compared to benchmarks) and how much is due to genuine movements in the market.
- 8.13 We are also concerned about the lack of a defined econometric model identifying linkages between historic and predicted input price inflation in the report. Network Rail assumes that its specific input price inflation will fluctuate with RPI at a constant level, which we do not consider will necessarily be the case. However, we are encouraged that Network Rail plans to continue to monitor input price inflation during CP4, and we will work closely with the company to ensure that the monitoring and ongoing analysis of input prices is done in sufficient detail.
- 8.14 It is important that there are solid statistical foundations in Network Rail's input price analysis, as the company has said it intends to update its model throughout CP4. In other work on input prices, for instance the work commissioned by the Competition Commission during its 2007 review of Heathrow and Gatwick price controls, an econometric model is used as the basis for input price forecasting.⁶⁹ We view the lack of a formal model as a shortcoming, as the historic linkages appear to be based on assumptions rather than statistical analysis.
- 8.15 Although we have some concerns about LEK's methodology and assumptions, we consider that, overall, the results are broadly robust and represent a reasonable estimate of expected input price inflation in CP4. We have adjusted our efficiency assumptions with the values that LEK has set out in its study and included by Network Rail in its SBP.
- 8.16 We discuss the responses to our draft determinations in respect of input prices below.

Our draft determinations judgements on CP4 efficiencies

- 8.17 In making our judgements on efficiency for our draft determinations we considered the amount of efficiency improvement that Network Rail can make in CP4 and the speed at which it should be able to achieve this. In arriving at our judgements, we recognised and took into account the many and varied challenges that Network Rail faces in CP4 and the improvements it will need to make in train performance, safety and capacity, as well as in making further cost savings whilst minimising the disruption it causes to passengers and freight.

⁶⁹ See paragraph 166 of appendix D of the Competition Commission report. This may be accessed at www.competition-commission.org.uk/rep_pub/reports/2007/fulltext/532ad.pdf.

- 8.18 Given these challenges, we decided to profile further significant efficiency improvement (to catch-up the efficiency gap) over ten years (in both CP4 and CP5). We recognised that many of the further cost savings that the company needs to make may be difficult to achieve and significant implementation of new technologies and working methods. Given the challenges Network Rail faces in CP4 we decided that it is right to give the company sufficient time to do this and not to expect that the efficiency gap can be closed completely in CP4.
- 8.19 We judged that ten years is an appropriate time period for Network Rail to close the gap to its peers. This necessarily required a large degree of judgement but we have examined the rate of change that other regulated industries have achieved and we have considered some of the specific changes Network Rail may make to reduce its costs (and the speed at which these could be made). We took account of Network Rail's own aspirations to achieve 'world class' status, although the company has not set out a date for when it hopes to achieve this. We considered that a balance of making two-thirds of the improvement in CP4 and one-third in CP5 is appropriate.
- 8.20 Our overall assumptions on the scope for efficiency improvement in CP5 are indicative at this stage. We would expect to review efficiency in detail at the next periodic review based on further evidence of the company's progress and external benchmarking. Our judgements on the scope for efficiency improvement in CP5 will take into account the outputs that Network Rail will need to deliver in CP5 and decisions about any changes to the wider regulatory and financial framework for the company.
- 8.21 Table 8.1 sets out the CP4 efficiency assumptions included in our draft determinations. It assumed that Network Rail should be able to catch-up two-thirds of the efficiency gap in CP4 and took into account expected frontier-shift and input price inflation above that reflected in RPI.
- 8.22 In calculating the overall level of improvement for CP4 (and indicatively for CP5) we combined the overall improvements in catch-up efficiency, frontier-shift and input price inflation to give a total level of efficiency improvement. We then assumed that two-thirds of this applied to CP4 and we considered that it was appropriate to assume equal levels of improvement for each of opex and M&R in CP4 (i.e. the same annual value for percentage improvement).
- 8.23 The annual profiles for the overall CP4 efficiencies that we set out in our draft determinations (consistent with table 8.1) are set out in table 8.2.

Table 8.1: Our draft determinations judgement on the possible scope for CP4 efficiency improvement over ten-years

| | Maintenance | Renewals | M&R (weighted) | Opex | OM&R (weighted) |
|--|-------------|------------|----------------|------------|-----------------|
| Efficiency gap | | | | | |
| End CP3 efficiency gap | 31% | 36% | 35% | 35% | 35% |
| CP4 efficiency | | | | | |
| Two-thirds of catch-up in CP4 | 20% | 24% | 23% | 23% | 23% |
| Frontier-shift | 3% | 3% | 3% | 1% | 3% |
| Input price adjustment | (6%) | (3%) | (4%) | (8%) | (5%) |
| Total efficiency in CP4 | 17% | 24% | 22% | 17% | 21% |
| <i>Network Rail's SBP</i> | ~12% | ~15% | ~14% | ~7% | ~13% |
| CP5 efficiency | | | | | |
| One third of catch-up in CP5 (indicative) | 10% | 12% | 12% | 12% | 12% |
| Frontier-shift (indicative) | 3% | 3% | 3% | 1% | 3% |
| Input price adjustment (indicative) | (6%) | (3%) | (4%) | (8%) | (5%) |
| Total efficiency in CP5 (indicative) | 7% | 12% | 11% | 5% | 10% |
| Total efficiency in CP4 and CP5 (indicative) | 24% | 36% | 33% | 22% | 31% |

Table 8.2: Our draft determinations annual profiles for CP4 efficiencies

| | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total |
|---------------------------------------|-------------|-------------|-------------|-------------|-------------|--------------|
| M&R | 5% | 5% | 5% | 5% | 5% | 22.6% |
| <i>Network Rail M&R</i> | 3.8% | 3.5% | 3.1% | 2.8% | 1.7% | 14.0% |
| Controllable opex | 3.5% | 3.5% | 3.5% | 3.5% | 3.5% | 16.3% |
| <i>Network Rail Controllable opex</i> | 2.1% | 2.2% | 1.6% | 1.1% | 0.6% | 7.4% |

Responses to our draft determinations

Network Rail's response

- 8.24 As already highlighted in chapter 7, Network Rail made an extensive criticism of our efficiency analysis and judgements in its response to our draft determinations.
- 8.25 In the previous chapter we have addressed the significant issues Network Rail raised about our assessment of the efficiency gap. The company also raised further issues about the way we had used our evidence and our resulting efficiency profiles for CP4. In particular it commented on:
- the CP4 starting point (the level of efficiency achievable in 2009-10) and the resulting implications for the rest of CP4;
 - the exclusion of enabling investment necessary to deliver efficiency;
 - apparent double counting of efficiencies (between our judgements on efficiency and the reductions we made to Network Rail's proposed renewals volumes);
 - the combination of maintenance and renewals efficiencies into a single value for CP4;
 - the application of efficiency to some investment that should be already considered 'post-efficient';
 - the risks it believes it is facing in renewals input prices; and
 - the pace of efficiency improvement we have assumed is possible.

Other responses

- 8.26 There is wide recognition across responses for the need for further efficiency improvements. This includes passenger and freight train operators and government. Some respondents, including franchised passenger train operators, point towards specific areas of potential improvement in efficiency by Network Rail. EWS has submitted detailed supporting evidence on the scope for efficiency improvement. RIA has commissioned its own international benchmarking work which it has submitted to us and it has also provided evidence on input prices (which is discussed further below).
- 8.27 Many respondents recognise the importance of the efficiency issue and acknowledge the wide range of detailed work that has been undertaken and some say that they are not qualified to provide detailed comments. Whilst there is general support of the need for efficiency improvement, some respondents say that we should not make assumptions that are 'too tough' which risk jeopardising performance and safety (though these responses are not generally quantified). In particular, the trade unions consider that our efficiency assumptions will increase pressure on their members and increase risk.

- 8.28 Examples of areas for efficiency improvement cited by train operators include Network Rail's possessions management, Network Rail's internal structure, standards and policies, its project management processes and the speed of adoption of new methods.

Our response to the issues raised

- 8.29 We welcome the engagement by stakeholders on efficiency, which is such an important issue for Network Rail and the industry. We welcome in particular the examples of potential areas for efficiency improvement identified by train operators. We note that Network Rail itself recognises many of the issues. Nonetheless, we anticipate that these issues will be discussed further by Network Rail and its partners. We would expect that Network Rail will want to draw on the knowledge and experience of the train operators who have raised these issues, which provides further demonstration of the potential value of the efficiency benefit sharing mechanism we are implementing (discussed further in chapter 27). We would expect that the issues raised, whilst requiring further discussion, provide opportunities for greater efficiency improvements than Network Rail considers is possible.
- 8.30 We have carefully reviewed all the responses we received. Further detail on the issues raised will be provided in the document on the draft determinations responses that we are publishing in November 2008. In respect of the key issues raised by Network Rail our response is as follows.

The CP4 starting point

- 8.31 The company does not consider it can reduce O&M costs in 2009-10 to the level we assumed in our draft determinations. It says that given where it stands today, and the cost increases it is now facing compared to its SBP update, it will not be able to achieve our draft determinations O&M efficiency assumptions of, respectively, 3.5% and 5% in 2009-10, let alone the higher efficiencies that would enable it to compensate for the cost increases. The company considers that achieving its existing projections for operating and maintenance costs in the first year of CP4 is already a major challenge and for us to assume a lower starting point (i.e. higher efficiency) is unrealistic. Consequently, Network Rail asked us to increase its allowance for O&M by £62m to £1,810m for 2009-10 (approximately 3%). Rolling this increased level of spend forward would increase the CP4 maintenance and opex allowance by £290m.
- 8.32 Based on our review of Network Rail's response and further submissions it has made on this issue, we do not consider there is a case for a significant increase in O&M costs in 2009-10. We have made provision for some increased expenditure in 2009-10 (with further costs beyond that) for correction of Network Rail's assumed pension costs (to be on a consistent accounting basis) and the harmonisation of maintenance employment terms and conditions (which is discussed further in chapter 5).

- 8.33 As we discuss further below, we are reprofiling our assumptions on efficiency improvement in CP4 compared to our draft determinations, reducing them in the first two years. Doing this provides Network Rail with an increase in expenditure and revenue compared to our draft determinations.

Post-efficient renewals

- 8.34 In our draft determinations we applied our efficiency assumptions to all of Network Rail's pre-efficient renewals expenditure. We recognise, as does Network Rail, that the scope for improving efficiency will vary between different asset categories. Network Rail will alter the balance of actual expenditure between different renewals asset categories depending on its actual activity plans and the efficiency it has achieved or is planning to achieve.
- 8.35 However, in its response to our draft determinations Network Rail said that there are a number of elements of its renewals plans where its proposals are already based on efficient costs and, as such, it is not appropriate for us to apply further efficiencies. Network Rail considers that this work relates to: the GSM-R/FTN telecoms project, the ERTMS development and cab fitment programme; signalling central contract costs; King's Cross station; procurement of plant for high output track renewals; and various discretionary work. Network Rail estimated that the impact of our application of efficiency to this work reduces the assumption for CP4 renewals expenditure by £130m. Network Rail has said that this work is for specific projects, where specific cost estimates have been developed or where contracts have been committed.
- 8.36 We have reviewed Network Rail's response and accept that some of the work should not be subject to our efficiency assumptions. Our views on the specific work is:
- **GSM-R/FTN.** Network Rail said in its SBP update that the expenditure on this project in CP4 will be £573m. We have subsequently received from the company a further update of its expenditure proposals for this programme for CP4 of £678m. Of the £678m, £131m covers cab fitment which we do not consider should be treated as post-efficiency. We consider that there should be opportunities for the industry to improve efficiency in this area. The remaining £547m relates to infrastructure. Of this, £162m is deferral from CP3. We accept that it is appropriate to treat this expenditure as post efficient, since it was subject to the original efficiency assessment for the GSM-R/FTN programme. A further £226m is expenditure originally planned for CP4. This will also be treated as post efficient since it will have been subject to the original efficiency assessment. A further £159m is new expenditure for CP4. We will not treat this as post-efficient and will apply our renewals efficiency assumptions to this.
 - **ERTMS.** This work covers £192m of programme development (£46m) and cab fitment costs (£142m) in CP4. Of this, we consider that only the development costs can be considered to be post-efficient, since this is akin

to a fixed sum fund. We have not seen any compelling reason why the cab fitment work should not be subjected to our efficiency assumptions.

- **Signalling central contract costs** (£160m). We consider that this work should be treated the same as general renewals work in CP4 and as such we will not treat it as being post-efficient.
- **Kings Cross station renewals** (£112m). We have not seen any compelling reason why this work should be treated as post-efficient.
- **High output track renewal equipment.** Network Rail has said that it is committed to expenditure of £111m for the procurement of plant for high output track renewals work. This covers three items: a high output track renewals equipment, a high output ballast cleaner and mid-life refurbishment of existing equipment. We consider that of this only the £56.5m for the track renewals equipment is clearly committed and it is therefore appropriate to treat it as being post-efficient.
- **Committed discretionary schemes.** Network Rail has said that it is progressing a number of discretionary investment schemes (in total £70m). These include the in-sourcing of telecoms maintenance, the modular S&C development project and a project to improve its materials supply chain). We have reviewed Network Rail's arguments that we treat the CP4 costs for these projects as being post-efficient, however we see no compelling reason to exclude these costs from our efficiency assumptions.

Enabling investment

- 8.37 Network Rail argued that in order to deliver efficiencies in CP4 and beyond it needs to make up-front investment. In particular it cited our exclusion of its proposed investment in IT and corporate accommodation as a key issue. We have reviewed Network Rail's further submission on this investment and are making provision for this in our determination (as discussed in chapter 5).
- 8.38 Further investment that Network Rail may want to undertake in CP4 can, in principle, be approved under the investment framework arrangements and/or through the new procedures for logging up (efficient) overspend to the RAB in CP4 (discussed in chapter 15).

"Double counting" of scope and efficiency reductions

- 8.39 Network Rail argued that we have double counted scope reductions and the assumptions we are making for efficiency improvement. We have reviewed the company's arguments. We kept our assessment of volumes and efficiency assessment separate. The volume reductions are for over scoped or unnecessary work on the basis of Network Rail's asset management policies and plans for CP4. These changes do not preclude further reductions in

volumes to deliver efficiencies if these are consistent with the company's asset policies.⁷⁰

Combining maintenance and renewals efficiencies

8.40 In our draft determinations we adopted the same efficiency value for maintenance and renewals (weighted by the forecast of relative expenditure). This recognises that key evidence we used to establish our M&R efficiencies was based on total M&R costs and that Network Rail has some scope to switch between maintenance and renewals to deliver outputs (at least in the short-term). Network Rail argued that because maintenance is remunerated on a pay as you go basis and renewals is added to the RAB as capital expenditure that our proposed treatment of a combined efficiency assumption would impose a significant revenue impact to the company of more than £100m in CP4. We recognise the point that Network Rail has made and in our determination we are establishing separate profiles for maintenance and renewals efficiencies. Unwinding the combined M&R gives lower maintenance efficiencies and higher renewals efficiencies.

Input prices

- 8.41 Network Rail responded to our assessment of input prices as part of its response to the draft determinations. The company has disagreed with our assertion that an econometric model would provide a better base for forecasting input price inflation. Its argument is that the industry has been through significant structural changes and that an econometric model is not appropriate. It also claims that one-off changes in supply and demand will continue to have an impact on its input price costs. Its inputs will also include significant expenditure on traded commodities for which econometric models do not provide robust forecasts over time. Network Rail has proposed that we should index renewals input price inflation rather than relying on the re-opener provisions or the risk buffer to deal with this risk.
- 8.42 RIA has also submitted to us its view on expected input price inflation in CP4. We welcome its updated submission and its input on the efficiency debate. Based on a survey of its members it considers that input price increases in CP4 are likely to be around 2% to 3% per annum greater than RPI.⁷¹ This is based on respondents claiming that skills shortages are being experienced by 80% of its members. RIA also claims that demand growth is high and the labour market is already stretched.
- 8.43 We welcome RIA's submission. Although RIA's estimate is different from the 'headline' input price estimate of 1% per annum, the underlying labour input price forecast is consistent with RIA's forecast. (The labour input price forecast is offset by a low estimate for materials input price inflation.)

⁷⁰ It is also important to note that we made a steady-state volume adjustment to the LICB dataset for Network Rail which, in any event, more than compensates for the reduction in volumes made.

⁷¹ RIA's letter may be accessed at www.rail-reg.gov.uk/upload/pdf/sbpcons-ria-270308.pdf.

Nonetheless, RIA's work, alongside Network Rail's arguments and the original LEK study, demonstrate to us that there is sufficient uncertainty in some of the input costs that Network Rail is exposed to which justifies adopting indexing for renewals input prices in CP4.

- 8.44 Our approach for indexing renewals input price inflation is explained in chapter 15.

Pace of change

- 8.45 Given the importance it attaches to this issue, Network Rail provided no specific evidence in its draft determinations response on the pace of change beyond assertions that the pace of efficiency improvement we are imposing on it is unrealistic given everything that it has achieved to date and what needs to be achieved in the next few years.
- 8.46 We recognise how far the company has come since it took over Railtrack (in administration) in 2002. We also recognise, as is made plain in this document, the expectations on the company in the next control period to improve on a number of fronts. However, we have strong evidence that it does face a significant efficiency gap. It is right that Network Rail is benchmarked against its peers (e.g. rail infrastructure managers in Europe) and that it should aspire to achieve the same, if not a better, level of efficiency. The evidence we have on the scope for efficiency improvement is compelling but we recognise that significant organisational change can take a number of years to drive through fully. Recognising the progress that Network Rail has already made and the challenges it faces in CP4 we consider a further ten years is an appropriate time period to close the gap.
- 8.47 It is important to note that the benchmark we are using (for our international benchmarking of M&R) is the upper quartile of the peer group rather than the frontier. We also note the points made by Dr Michael Pollitt in his review of the econometric analysis (covered in chapter 7) on the relative generosity of our benchmarking approach.
- 8.48 EWS provided a supporting paper with its response to our draft determinations which explicitly addresses the pace of change issue and makes a range of recommendations. We welcome this work, which has drawn on the experience of a number of industry experts. It highlights a range of areas where EWS considers the company could change faster, including in the introduction of new technologies into GB from other countries. The paper also notes that some of the delays could be ascribed to wider industry processes rather than just Network Rail. Where possible we will support Network Rail and the industry in tackling processes that may impose an unnecessary burden and constrain the implementation of processes, technologies and working methods that enable a faster or greater level of efficiency to be achieved.
- 8.49 We have not received any compelling evidence from Network Rail on why it cannot achieve the efficiencies over CP4 that we assume are possible, with

the exception of the specific case it has made about 2009-10 expenditure (and the implications for the rest of CP4). However, as highlighted above, we consider it is reasonable to recognise the real issues Network Rail appears likely to face in 2009-10 and the further challenge of achieving our efficiencies given all the initiatives the company needs to establish and deliver during CP4. In addition, we note that the periodic review CP4 capital programme is front-end loaded and therefore, having reviewed the responses to our draft determinations we consider that it is reasonable to reprofile the efficiency improvement whilst retaining the same exit rate for OM&R efficiency overall, as set out in our draft determinations. We will reduce the amount of efficiency improvement required in the first two years of CP4, to provide the company with the time to plan and implement the changes required to deliver the efficiency improvement whilst managing the delivery of the major CP4 capital programme in the first two years of CP4 in particular. We will increase the efficiencies in the final three years of CP4.

- 8.50 The issues raised by the trade unions are important. We have given considerable attention to the management of safety risk in CP4, which has been an important part of our PR08 process. This issue is discussed in more detail in chapter 11.

Our determination – efficiency judgements for CP4

- 8.51 As mentioned above, our judgements in terms of the CP4 exit rate stand (as per our draft determinations). There is no new evidence that materially affects our proposals for the overall gap and level of efficiency improvement in CP4 as a whole. However we have considered the arguments that Network Rail and other stakeholders have made and we are making a number of changes. In particular, establishing separate maintenance and renewals efficiency profiles and re-profiling the efficiencies to give the company more time to identify and implement the changes required to achieve the efficiency improvements has given rise to material differences compared to our draft determinations.⁷²
- 8.52 Table 8.3 sets out our judgements on the scope for efficiency improvement in OM&R in CP4. Table 8.4 provides further detail for our assumptions.

Table 8.3: CP4 efficiency assumptions

| | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total |
|------------------------------|-------------|-------------|-------------|-------------|-------------|--------------|
| Controllable opex | 2.8% | 2.8% | 4.0% | 4.0% | 4.0% | 16.4% |
| <i>Network Rail proposal</i> | 2.1% | 2.2% | 1.6% | 1.1% | 0.6% | 7.4% |
| Maintenance | 3.2% | 3.2% | 4.0% | 4.5% | 4.5% | 18.0% |
| <i>Network Rail proposal</i> | 3.1% | 3.0% | 2.7% | 2.5% | 1.5% | 12.2% |

⁷² We establish the re-phased efficiency profiles through applying the explicit profile of assumed input price inflation, which varies each year and is higher in the earlier years of CP4.

| | | | | | | |
|------------------------------|-------------|-------------|-------------|-------------|-------------|--------------|
| Renewals | 5.0% | 5.0% | 5.5% | 5.5% | 5.5% | 23.8% |
| <i>Network Rail proposal</i> | <i>4.1%</i> | <i>3.7%</i> | <i>3.2%</i> | <i>2.9%</i> | <i>1.8%</i> | <i>14.8%</i> |

Table 8.4: Detail for the CP4 efficiency assumptions

| | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|---------------------------|----------------|----------------|----------------|----------------|----------------|
| Controllable opex | | | | | |
| Catch-up efficiency | 4.9% | 4.9% | 4.9% | 4.9% | 4.9% |
| Frontier-shift efficiency | 0.2% | 0.2% | 0.2% | 0.2% | 0.2% |
| Gross efficiency | 5.1% | 5.1% | 5.1% | 5.1% | 5.1% |
| Input price adjustment | -2.3% | -2.3% | -1.1% | -1.1% | -1.1% |
| 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 | | | | | |
| Catch-up efficiency | 4.5% | 4.6% | 4.6% | 4.3% | 4.3% |
| Frontier-shift efficiency | 0.7% | 0.7% | 0.7% | 0.7% | 0.7% |
| Gross efficiency | 5.2% | 5.3% | 5.3% | 5.0% | 5.0% |
| Input price adjustment | -2.0% | -2.1% | -1.3% | -0.5% | -0.5% |
| 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 | | | | | |
| Catch-up efficiency | 5.2% | 5.7% | 5.6% | 4.9% | 5.0% |
| Frontier-shift efficiency | 0.7% | 0.7% | 0.7% | 0.7% | 0.7% |
| Gross efficiency | 5.9% | 6.4% | 6.3% | 5.6% | 5.7% |
| Input price adjustment | -0.9% | -1.4% | -0.8% | -0.1% | -0.2% |
| 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% |

Can these efficiencies be achieved in CP4?

8.53 In making these judgements we have very carefully considered all the available evidence and we have paid particular regard to the required pace of change in CP4. We consider that the efficiencies can be achieved in CP4, and potentially outperformed, for a range of reasons:

- Network Rail expects to achieve efficiency improvement of 27% during CP3 (on average this is around 6% pa across OM&R and it has faced input price pressures in addition to this). This demonstrates that significant cost reductions can be achieved within a five-year period. These efficiencies in CP3 were achieved against the backdrop of major change and advances by Network Rail on a range of fronts;
- sustained levels of significant cost reduction have been achieved by other regulated utilities in Great Britain over a long period of time, as evidenced by both the Oxera study for us, and the LECG report for Network Rail;
- the Oxera analysis identifies that Network Rail could achieve between 4% and 6.2% per annum in opex efficiency improvement if it is assumed that Network Rail currently only operates at 'average efficiency';
- the class 1 railroads in the USA have achieved, on average, productivity improvements of around 4% to 5% per annum over the last 25 years since the Staggers Act in 1980;
- Network Rail aspires to be a 'world class' company. Whilst being a world class business involves more than just minimising cost, there is clear evidence of significantly higher levels of efficiency in Europe and elsewhere that Network Rail must aim towards. We consider that providing the company a further ten years to close the gap on top of the progress it has made in CP3 is reasonable;
- Network Rail considers that it should be able to outperform its own efficiency assumptions. For instance, in the SBP it said that its proposals are "challenging but achievable" and that it has "a reasonable chance of success by meeting – or even outperforming – this target". In fact, Network Rail has identified the possibility of exceeding its efficiency assumptions. The company undertook some 'quantified risk analysis' for its renewal efficiency proposals. This shows that they consider that there is a 20% probability that they could achieve around 17% or more through the various bottom-up initiatives they have identified;
- we have reviewed Network Rail's own 'bottom-up' efficiency initiatives and consider that it should be able to achieve significantly more than it has proposed across OM&R.
- our international visits have demonstrated that there should be significant opportunities for Network Rail to learn from other rail infrastructure managers across the world to improve efficiency. By drawing on practices already used elsewhere, Network Rail should be able to accelerate implementation in Britain;
- the RailKonsult studies have identified a range of technologies and working methods currently employed by other infrastructure managers in Europe that could be implemented in GB. RailKonsult has set out that in principle these could be delivered in GB within five years;
- the opportunities for efficiency improvement that Network Rail's consultants BSL identify (some based on private discussions with European contractors who have experience of working both in Britain and

Europe). BSL say that the main areas for improvement are better planning and work programming; better possessions management; increased standardisation; and increased attention to quality (relating both to asset condition and workforce development);

- the work by AMCL on asset management highlights further opportunities for improvements in asset management;
- the study undertaken by EWS on the pace of change, and submitted as part of its draft determinations response, has highlighted areas where the company could change faster, including in the introduction of new technologies into GB from other countries. In addition, the areas for potential efficiency improvement identified by other respondents to our draft determinations also highlight opportunities for further efficiency improvement;
- the provision for efficiency enabling expenditure we are including in the determination and the provision for the costs of harmonising maintenance employment terms and conditions should also enable greater and faster efficiency improvement than the company assumed in its SBP update;
- the study by NERA on the benefits of unsupported debt suggests an additional 0.5% per annum additional efficiency, which we consider should start in parallel with the introduction of unsupported debt in CP4; and
- the efficiency benefit sharing mechanism that is being introduced should strengthen the incentives to achieve and outperform our determination.

9. Enhancement expenditure

Introduction

- 9.1 This chapter sets out our assessment in respect of enhancement expenditure. Network Rail will be funded to deliver certain defined projects. It will also be funded to deliver a range of specified outputs, such as increased capacity, for which it will need to invest in enhancements to the network. Although we have assessed the efficient level of funding for delivery of these outputs by considering the nature and extent of the enhancement programme which may be required, we are leaving Network Rail the flexibility to decide exactly which schemes it will undertake to deliver the outputs.
- 9.2 Network Rail must define those schemes in its CP4 delivery plan. Any changes it makes between now and then must be consistent with our determination and, where appropriate, with decisions by DfT on its rolling stock procurement and cascade plans. Once the delivery plan is accepted, any changes to it will be subject to a regulated change control process (see chapter 4).
- 9.3 This chapter covers:
- Network Rail's enhancement proposals;
 - our approach to the treatment of enhancements in PR08;
 - core issues on the assessment of scheme costs: efficiency and the treatment of risk;
 - our assessment of enhancement requirements and costs to satisfy the requirements of the HLOS for England & Wales;
 - our assessment of further investment which is required under the terms of Network Rail's network and station licences to give full effect to the HLOSs in their statutory and regulatory context;
 - our assessment of Transport Scotland's enhancement requirements and costs to satisfy the requirements of the HLOS for Scotland; and
 - our determination on funding and the outputs to be delivered.
- 9.4 In each case we first describe the analysis supporting our draft determinations. This is followed by an overview of the consultation responses we received, our views on these and a summary of our conclusions, highlighting any changes from the draft determinations.

Network Rail's enhancement proposals

9.5 Network Rail set out its plans in its SBP, but we had some concerns which we included in our February 2008 assessment.⁷³ Network Rail provided a substantially revised response in its April 2008 update, and this chapter is based on the update. The update proposed £11.1bn of enhancement expenditure during CP4, in response to the requirements of the two HLOSs and the demand for a growing and sustainable railway.

9.6 Of this, some £9.0bn is in scope for this review:

- £8.6bn in England & Wales including baseline (committed) schemes, schemes specified in the HLOS (such as Thameslink) or required for the delivery of the HLOS capacity and performance metrics, and schemes which are proposed on the basis of economic or financial business cases (such as the seven day railway); and
- £448m in Scotland, including Transport Scotland HLOS specified projects (Airdrie to Bathgate and Glasgow Airport Rail Link) and development funding for future projects.

9.7 The remaining £2.1bn consists of Transport Innovation Fund schemes (around £120m), third party funded schemes (around £780m) and Crossrail (around £1.2bn in CP4). The funding of these projects is not part of PR08.

Table 9.1: Network Rail's proposed CP4 enhancement programme

| £m (2006-07 prices) | SBP update | Description |
|--------------------------|---------------|--|
| England & Wales projects | 8,581 | Projects in England & Wales including baseline projects, specified projects required to deliver the HLOS outputs plus options to deliver further outputs |
| Scotland projects | 448 | Scotland HLOS specified (Tier 2) projects, development funding plus options to deliver further outputs |
| TIF projects | 117 | Projects funded through the Transport Innovation Fund |
| Third party projects | 779 | Projects funded by third parties e.g. Olympics 2012 |
| Crossrail | 1,225 | Network Rail infrastructure works as part of Crossrail project |
| CP4 total | 11,150 | |

⁷³ Update on the framework for setting outputs and access charges and strategic business plan assessment, Office of Rail Regulation, February 2008. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/351.pdf>.

Our approach to the assessment of enhancements

- 9.8 In our draft determinations we assessed the efficient costs of enhancements to deliver the specified outputs and the individually defined projects included in the two HLOSs. Determining efficient costs involved a review of project and programme scope, efficiency, and the treatment of risk.
- 9.9 For the England & Wales HLOS this assessment covered:
- the baseline (committed) schemes and defined schemes;
 - schemes stated to be necessary to deliver the capacity specification;
 - schemes stated to be necessary to deliver the performance specification; and
 - schemes stated to be justifiable to deliver the general 'levelling up' requirement for performance.
- 9.10 For the Scotland HLOS this assessment covered the Airdrie-Bathgate and Glasgow Airport Rail Link (GARL) projects and delivery of the 92% PPM target.
- 9.11 Network Rail stated that no further enhancement projects are needed to deliver the (Great Britain) safety specification. We agree with this assessment but we have also agreed that Network Rail should be able to carry into CP4 part of the safety and environment fund that was not spent in CP3 (see later).
- 9.12 Network Rail proposed other enhancements and incremental expenditure beyond what is required to meet the specific terms of the two HLOSs. We reviewed this expenditure to establish the extent to which any of it is justified and necessary in CP4 to give full effect to the HLOSs in their statutory and regulatory context and, in particular, Network Rail's obligations under condition 7 of its network licence.
- 9.13 The remainder of this chapter considers these assessments in more detail beginning with an overview of how efficient costs are determined and an analysis of the treatment of risk.

Core issues on scheme costs: efficiency and risk

Efficiency – draft determinations analysis

- 9.14 In our draft determinations we noted that Network Rail had built up its cost proposals based on bills of quantities and unit rates from recent competitively tendered projects to provide an estimate of the current level of efficient costs.
- 9.15 We carried out our own review of efficient project costs informed by three consultancy studies: Arup provided engineering advice including advice on scheme costs, SDG provided strategic advice and Halcrow (the independent reporter) provided advice on West Coast schemes. We also considered work by our consultants on efficiency. Efficient costs have, where possible, been

estimated bottom-up by examining project scope, project costs, future efficient costs, further efficiency due to frontier shift and input price inflation.

- 9.16 **Project scope.** For each project we reviewed whether it is likely to achieve what it sets out to do, whether it is needed to deliver either HLOS and whether schemes overlap or have interdependencies.
- 9.17 **Project costs.** We reviewed key Network Rail unit rates based on our own evidence of recent competitively tendered projects, making amendments where necessary to ensure that they reflect efficient construction costs.
- 9.18 **Future efficient costs.** In the draft determinations we set out future efficiency trajectories for maintenance, renewals and operating expenditure. Our assessment of future efficient enhancement expenditure took into account:
- the extent to which enhancements are similar to renewals, for example where there is a large volume of repeatable tasks with the potential for modular solutions; and
 - the scope for Network Rail to continue to refine its investment programme where its obligations under this determination relate to outputs (performance and route capacity) and not to delivery of specific schemes.
- 9.19 We drew on the detailed assessment of maintenance and renewals efficiency, and in particular our international analysis and benchmarking work. Our consultants RailKonsult identified a range of technologies and working methods that Network Rail could adopt to reduce the gap between itself and best European practice including modular approaches and dedicated teams. In a study for Network Rail, consultants BSL identified opportunities for greater efficiency in work planning, possessions management, work standardisation and improvement in quality. Whilst these two studies focused on maintenance and renewals we consider that to a large extent the findings apply to comparable enhancement activity. Other studies that point towards potential efficiencies include Network Rail's procurement efficiency study (by AT Kearney) and the best practice review of Network Rail's asset management carried out by AMCL (independent reporters).
- 9.20 We considered whether to apply the full future efficiency factor determined for renewal expenditure to comparable parts of the enhancement expenditure. This would have implied average efficiency savings of around 14% over the course of CP4. However, we recognised that the comparison is not exact and so we took a more conservative view leading to somewhat lower reductions.
- 9.21 For platform extension works we said that an average cost reduction of 12.5% was achievable, taking into account the large scale of the programme and the significant scope for modularisation. We considered that such efficiency savings were readily achievable, with RailKonsult estimating a 25% saving in platform costs from modularisation.

- 9.22 For power supply works we said we believed that an average cost reduction of 7.5% is achievable. This took into account the lower potential for modularisation for this work.
- 9.23 We assumed a 5% efficiency saving for other, non-specified, schemes reflecting opportunities for improved procurement, work and possessions planning and project management. The evidence indicated that such efficiencies were readily achievable and that there was scope for Network Rail to outperform our assumptions.
- 9.24 **Frontier shift** is future efficiency gain due to productivity improvements over time (e.g. due to technological developments). Any potential for frontier shift would be in addition to the efficiency savings listed above. We commissioned consultants Oxera to estimate the scope for frontier shift efficiency gain in enhancements. Oxera estimated that Network Rail could improve the efficiency of enhancement expenditure by 0.3% - 1.1% per annum. We assumed a gain of 0.7% per annum, applied to forecast expenditure in each year. Frontier shift efficiency was not applied to capped funds (such as the strategic freight network), where costs are based on allocations (for example station schemes which are part developer/third party funded) or where cost estimates are sufficiently advanced that further efficiency is unlikely (for example King's Cross).
- 9.25 **Input price inflation (IPI)**. In its SBP update Network Rail allowed for input price inflation in its cost estimates explicitly for the schemes listed in the HLOSs and implicitly for other schemes (through its assumption on risk allowances). Consistent with our treatment of input price inflation in operations, maintenance and renewals we retained Network Rail's allowance in our calculations.

Consultation responses

- 9.26 Network Rail disputed the efficiency adjustments that we made in the draft determinations. Although it recognised that many enhancement activities were similar to renewals, it stated that no efficiency adjustment should be made to them, as cost estimates and scope are uncertain. Network Rail also said that we should not apply efficiency overlays to schemes that are well advanced such as King's Cross and GSM-R/FTN, as the cost estimates of these schemes are already based on efficient prices.
- 9.27 Network Rail further disputed our conclusions on the potential for efficiency savings on platform lengthening. It stated that administration costs should be excluded and that efficiency savings should not be applied to all platforms.
- 9.28 Many train operators and other consultees also commented on enhancement efficiency, mainly to point out considerable scope for further efficiencies based on their own experience of Network Rail's work. We are publishing a separate document in November 2008 which describes these response in more detail.

Our determination on efficiency

- 9.29 We reject the suggestion that we should assume no improved efficiency in enhancement projects. We believe there is significant scope for this and that our draft determinations are, if anything, conservative in this respect. In this determination we increase our assessment of Network Rail's scope for renewals efficiency from 14% to 15% on average over CP4. To the extent that enhancements are similar to renewals this implies still greater potential for enhancement efficiencies, however we are not changing our assumptions on this. We now deal with the points raised by Network Rail in turn.
- 9.30 We understand that Network Rail's project costs already allow for uncertainty. For projects at an early stage of development (GRIP stage 0/1) Network Rail has used risk modelling to identify P80 allowances which represent around a 30% uplift on base project costs. The early stage of development of projects should not therefore be a barrier to improved efficiency. Indeed, there is greater scope to identify efficiencies as project scopes and costs are refined.
- 9.31 For projects that are well advanced, such as King's Cross, we did not apply an additional efficiency overlay in the draft determinations as we agree with Network Rail that these costs should reflect efficient prices. For GSM-R/FTN we did not apply a unit cost efficiency overlay but did reduce project scope to ensure costs were efficient.
- 9.32 Network Rail has considerable flexibility in the choice and scope of projects to deliver the HLOS capacity metric. We are surprised that Network Rail does not consider that this flexibility will allow it to achieve efficiencies. We continue to believe that it will and we have retained the nominal 5% efficiency improvement associated with this - although we consider that the scope for improved efficiency could be much greater.
- 9.33 We disagree with Network Rail's position on the potential for savings on the platform extension programme. Around 40% of Arup's cost estimates for this programme are for platforms themselves, and we believe that modular platforms could lead to a 25% reduction in these costs (Network Rail's own data also appears to indicate savings of around 25% from modular construction). We also consider that some savings in administration costs should be included in our efficiency assumption. Much of the balance of the expenditure is for moving signals and crossovers and station works; we consider that there is also scope for efficiency improvement in these activities, and that an overall efficiency gain of 12.5% is entirely reasonable.
- 9.34 Taking these factors into account we do not intend to change the allowance made for enhancements efficiency from our draft determination. Our final adjustments are therefore:
- Platform costs: catch-up/scope efficiency of 12.5%;
 - Power supply costs: catch-up/scope efficiency of 7.5%;

- Other non specified projects: catch-up/scope efficiency of 5%;
- Specified or baseline projects: no catch-up/scope efficiency; and
- Frontier shift efficiency (for certain projects): 0.7% per year.

9.35 We have retained Network Rail's allowance for input price inflation.

Treatment of risk

Draft determinations analysis

- 9.36 As described in chapter 13, we have provided Network Rail with protection from financial risk in the form of a risk buffer of around £1bn over CP4, and, if necessary, deferral of capital expenditure allocated to a ring-fenced fund. This is designed to protect against cost and revenue shocks to the 'core' business of operating, maintaining and renewing the network. It is not designed to cover all of the project-specific risks relating to enhancements.
- 9.37 Network Rail proposed that projects are costed at P80⁷⁴. Over the whole CP4 programme Network Rail estimated that the difference between point cost estimates (that is scheme cost estimates excluding contingency) and the mean scheme cost taking account of risk adds 12% to scheme costs, with the P80 estimate adding a further 7% on the mean.
- 9.38 For specified projects the maximum cost caps identified in the HLOS already reflected P80 estimates and we believed that it was appropriate to retain this approach to give a high degree of certainty on the project costings.
- 9.39 Other schemes were generally at an early stage of development. Network Rail identified a portfolio P80 risk adjustment based on assumed cost distribution and project dependencies. For these projects the difference between the point estimate and the mean was 15% with a further 5% adjustment to the P80.
- 9.40 We considered whether P80 should be the basis for costing these projects. It could be argued that we would expect an averaging effect so that a provision based on P80 is not necessary. However, the 20% risk allowance which a P80 estimate represents is consistent with our investment framework. For projects at GRIP stage 5 this allows for a 10-15% (exceptionally up to 25%) contingency allowance. We would expect allowances for projects at earlier GRIP stages, as in the SBP update, to be somewhat higher. It is also consistent with regulatory precedent; the Competition Commission recently recommended a 25% contingency for BAA projects.
- 9.41 In chapter 15 we set out how we intend to treat overspend on enhancements. In England and Wales a proportion of any aggregate overspend will be logged up for inclusion in the RAB, but subject to Network Rail absorbing the first part of any overspend in each year and providing evidence that the remainder is

⁷⁴ I.e. A P80 cost is one which is thought to have only a 20% likelihood of being exceeded.

not manifestly inefficient. (A different approach applies in Scotland). It is therefore important that we make sufficient provision for the proposed enhancement portfolio.

- 9.42 On balance, therefore, we have accepted Network Rail's P80 methodology for these non-specified projects.

Consultation responses

- 9.43 Only Network Rail commented on our treatment of risk, welcoming our use of a P80 risk allowance.

Our determination on the treatment of risk

- 9.44 We have retained the P80 estimate in our allowances. This does not mean P80 risk allowance are always appropriate. For future projects we will consider the most appropriate approach depending on the circumstances.

Enhancements required by the England & Wales HLOS

Overview

- 9.45 The England & Wales HLOS explicitly requires delivery of:
- baseline (committed) schemes;
 - specified projects/programmes with capped CP4 expenditure (Thameslink; Birmingham New St station; Reading station; national stations improvement programme; Network Rail discretionary fund and strategic freight network);
 - specified programmes without capped expenditure: infrastructure elements of the intercity express programme (IEP);
 - the capacity output specification;
 - the performance specification including the 'levelling up' requirement;⁷⁵ and
 - the safety specification (for which no schemes are required).
- 9.46 Table 9.2 shows the breakdown of the £8,581m of enhancements proposed for England & Wales in the SBP update. Of this total, Network Rail states that £7,328m is needed to meet the explicit output requirements of the HLOS. We now assess this proposal.

⁷⁵ The England & Wales HLOS states that the Secretary of State "attaches importance to narrowing the gap between the poorest performing services and the rest".

Baseline schemes – our draft determinations analysis

- 9.47 Baseline (committed) schemes comprise the Access for All programme, King's Cross redevelopment and the remaining elements of the West Coast Route Modernisation (WCRM).
- 9.48 Access for All is a 10-year programme to enhance station accessibility. The programme was launched in March 2006 and there is a well-established framework for scheme identification, prioritisation and delivery. In the draft determinations we accepted Network Rail's proposed allowance of £206m.
- 9.49 The **King's Cross** redevelopment programme is a mixture of enhancement and renewals including a new western concourse and improvements to the train shed. It is well advanced (GRIP stage 6 – construction, test and commission) with enhancement works starting in CP3. Completion is tied to timetable changes in December 2011 and the Olympics. There are interdependencies with the Thameslink programme. We reviewed Network Rail's estimated costs of £175m and considered them to be reasonable. These costs already reflect Network Rail's own efficiency plan.

Table 9.2: Network Rail's proposals for England & Wales enhancement projects in CP4

| £m (2006-07 prices) | SBP update |
|--|--------------|
| Baseline projects | |
| Access for All | 206 |
| King's Cross redevelopment | 175 |
| West Coast: Stafford/Colwich remodelling | 483 |
| West Coast: Bletchley/Milton Keynes | 114 |
| West Coast power supply upgrade | 272 |
| Total England & Wales baseline projects | 1,251 |
| Specified projects | |
| Thameslink programme | 2,700 |
| Intercity express programme | 260 |
| Network Rail discretionary fund (NRDF) | 234 |
| National stations improvements programme (NSIP) | 156 |
| Strategic freight network (SFN) | 208 |
| Reading station area development | 456 |
| Birmingham New Street | 128 |
| Total HLOS specified | 4,141 |
| HLOS Capacity schemes | 1,685 |

| | |
|---|--------------|
| HLOS performance fund | 250 |
| Total to meet explicit HLOS requirements | 7,328 |
| Optional enhancement projects | 1,253 |
| Total England & Wales enhancements | 8,581 |

- 9.50 **WCRM** schemes comprise Stafford/Colwich remodelling, power supply upgrade and Bletchley/Milton Keynes remodelling. The first two schemes are expected to continue into CP5.
- 9.51 For Stafford/Colwich we have reservations over Network Rail's assumptions. The project is just entering the consultation phase of the Transport and Works Act process. Network Rail's estimated CP4 expenditure envisages greater progress in the first three years than we consider is realistic. In consideration of this and our efficiency assumptions, we reduced CP4 provision to £364m from Network Rail's £483m. Until the TWA process is concluded the scope of the project will remain uncertain.
- 9.52 The power supply upgrade is to strengthen the system for future increases in electrically hauled passenger and freight trains. Part of the work is to deliver an auto-transformer system from North Wembley to Carstairs, including work at Elvanfoot in Scotland. The CP3 element of this work is to support the December 2008 timetable improvements, with further phases continuing into CP4 and CP5. Because some of this work is linked to the requirements of the December 2008 timetable and should therefore have been completed under existing funding, we reduced the CP4 provision to £235m (from £272m).
- 9.53 The Bletchley/Milton Keynes project improves track layout and signalling to generate capacity and performance improvements. Minor adjustments have been made to Network Rail's cost estimate by applying a treatment of risk and possessions costs consistent with other WCRM projects. Our CP4 cost allowance is £107m compared to Network Rail's estimate of £114m.

Baseline schemes - consultation responses

- 9.54 Network Rail accepted our reduction in the provision for Stafford/Colwich. It challenged our reduction on power supply upgrade as it considered the CP4 funding was for additional enhancements and not those funded in CP3. It also challenged our reduction for Bletchley/Milton Keynes on the grounds of over-estimation of possessions costs, stating that these costs had increased following a change in approach after January 2008 possession overruns.

Baseline schemes – our determination

- 9.55 On **Access for All** Network Rail has written to us stating that it would like to defer £15m of expenditure on DDA (£13.7m in 2006-07 prices) from CP3 to CP4. As this expenditure would only be added to the RAB when it has been incurred we are content to increase the CP4 spending allowance by £13.7m.

- 9.56 On **WCRM** we confirm our allowance of £364m for Stafford/Colwich.
- 9.57 On power supply upgrade, throughout PR08 Network Rail has sought to hold to the ISBP figure by adjusting components of the cost estimate (e.g. the risk component has reduced yet there has been no change to the funding sought). We are not persuaded to change our view of funding requirements for CP4.
- 9.58 On Bletchley/Milton Keynes Network Rail's possessions cost allowance is 16%, compared to 3-4% on most projects. It has provided no evidence to support this difference so we retain the £107m draft determinations figure.
- 9.59 On King's Cross Network Rail has told us that it has spent £9m (£8.2m in 2006-07 prices) more than envisaged in CP3. As we are working from a total efficient price across CP3 and CP4 we have reduced the CP4 allowance by £8.2m accordingly.

Table 9.3: Baseline project funding in CP4

| £m (2006-07 prices) | SBP update | Draft determination | ORR conclusion | Of which deferrals (*overspend) in CP3 |
|--|---------------|------------------------|-------------------|---|
| Access for All | 206 | 206 | 220 | 14 |
| King's Cross redevelopment | 175 | 175 | 167 | (*8) |
| West Coast: Stafford/Colwich remodelling | 483 | 364 | 364 | 0 |
| West Coast: Bletchley/Milton Keynes | 114 | 107 | 107 | 0 |
| West Coast power supply upgrade | 272 | 235 | 235 | 0 |
| Total England & Wales baseline projects | 1,251 | 1,087 | 1,093 | 6 |

Specified schemes – our draft determinations analysis

- 9.60 **Thameslink** will be delivered in two key stages. The first provides capability for 12-car operations at a frequency of 16 trains per hour through the core London section and via the Midland Main Line towards Bedford by December 2011. The second connects to the Great Northern route and provides for operation of 12 car trains on the Peterborough and Cambridge routes by December 2015. The HLOS states that "The Programme, which will be managed by the DfT, is at an advanced stage of preparation and cost

estimates have been subject to close scrutiny.” DfT confirmed to us that it considers Network Rail's cost estimate of £2.70bn in CP4 to be efficient.

- 9.61 The **Birmingham New Street** scheme provides increased capacity for passenger movements and includes footbridge, platform and concourse works. The scheme, now known as Gateway +, is seen as a catalyst for redevelopment and regeneration of the area to the south of the station. Many organisations have an interest and financial involvement: Network Rail, Birmingham City Council, Advantage West Midlands, Centro, Department for Transport and the private sector. The HLOS sets a maximum of £128m in CP4 (£133m in 2006-07 prices) out of a total estimated project cost of £446m.
- 9.62 Much of the scheme relates to building rather than railway engineering works. We understand that implementation risks are shared between Network Rail (60%) and Birmingham City Council (40%). We considered Network Rail's estimate of £128m is reasonable, at slightly below the £133m HLOS cap.
- 9.63 The **Reading station** scheme involves platform, track, depot, major civil engineering and related station works to reduce conflicting train movements. The HLOS requires a scheme costing up to £425m in CP4 (£441m in 2006-07 prices). Network Rail sought £456m in CP4 in its SBP update, £15m more than specified in the HLOS. The total scheme cost is £525m over CP3, CP4 and CP5. These figures include a P80 risk allowance and input price inflation. In line with the HLOS we made provision for £441m expenditure in CP4.
- 9.64 This project is linked to the Reading southern platform extensions proposed by Network Rail to help deliver the capacity specification (and work should be undertaken at the same time). There are risks to delivery related to Transport and Works Act processes, which can take a significant time to complete.
- 9.65 **National station improvement programme (NSIP)** is a ring-fenced fund for station improvements. The HLOS proposed a CP4 spend of up to £150m (£156m 2006-07 prices). The scope of the works at each NSIP station is agreed by the cross-industry local delivery group, whose remit includes integrating these with other projects and renewal and maintenance activity.
- 9.66 With the programme board we have agreed a structure for demonstrating efficiency composed of: a cap on overhead costs including management costs, approvals and contingency allowance; upper limits and benchmark unit cost rates. We have also agreed high-level risk and project controls. These include dispute resolution procedures, procurement and contracting requirements and means of selecting the best party to deliver each scheme, including a challenge process. We retained Network Rail's proposed funding of £156m (£94m capital and £62m maintenance expenditure).
- 9.67 **Strategic freight network (SFN)** has been defined by Network Rail as a network of trunk routes with sufficient capacity and appropriate gauge to carry expected freight flows. The HLOS allocated £200m for development in CP4 (£208m in 2006-07 prices). Network Rail, after discussions with operators, made proposals in the SBP update encompassing Ipswich-Nuneaton capacity

enhancement, diversionary routes (from Southampton via Laverstock/Andover and from the Channel Tunnel route to the south of London) and ring fenced funds for train lengthening and in-fill gauge enhancement schemes.

Network Rail must work up detailed plans in the CP4 delivery plan, working with the industry and taking account of interdependencies with freight projects funded from other sources. We set the maximum CP4 spend at £208m.

- 9.68 The **Network Rail discretionary fund (NRDF)** is a mechanism for funding minor schemes which are linked to renewals or stand-alone schemes which have a positive whole-industry business case. The HLOS set out a proposed spend of £45m per annum over CP4 (£234m over CP4 in 2006-07 prices). We retained Network Rail's proposed allowance of £234m for CP4.
- 9.69 The **Intercity Express Programme (IEP)** is a set of infrastructure works to enable operation of a new generation of express trains. Works are focused on two routes: the East Coast main line (where IEP trains are due to start testing in 2012) and Great Western main line (services starting in 2016). Network Rail included £260m in the SBP update largely for platform lengthening, power supply and clearance works. These costs are at a very early stage of development and will need to be refined as the IEP requirements become clearer. We therefore retained Network Rail's proposed allowance.

Specified schemes - consultation responses

- 9.70 Network Rail has challenged our reduction in the costs for Reading stating that it would not be possible to deliver the intended scope in the plan for CP4, with the risk that scope will have to be deferred to CP5.

Specified schemes – our determination

- 9.71 We have reviewed the costs of Reading. We are content that Arup's analysis is robust; Network Rail should be able to deliver the proposed scope in CP4.
- 9.72 Separate from its response Network Rail has asked to defer £53 million of expenditure on Thameslink and £7m on Reading from CP3 to CP4 (at 2006-07 prices). As this expenditure would only be added to the RAB when it is made we are content to increase the CP4 expenditure allowance accordingly.
- 9.73 We are making no other changes to our draft determination.

Table 9.4: Funding for England & Wales specified projects in CP4

| £m (2006-07 prices) | SBP update | Draft determination | ORR conclusion | Of which deferrals from CP3 |
|------------------------|---------------|------------------------|-------------------|-----------------------------------|
| Thameslink | 2,700 | 2,700 | 2,753 | 53 |
| IEP | 260 | 260 | 260 | 0 |
| NRDF | 234 | 234 | 234 | 0 |
| NSIP | 156 | 156 | 156 | 0 |
| SFN | 208 | 208 | 208 | 0 |
| Reading | 456 | 441 | 448 | 7 |
| Birmingham New St | 128 | 128 | 128 | 0 |
| Total | 4,141 | 4,127 | 4,187 | 60 |

Capacity schemes – our draft determinations analysis

9.74 The HLOS defines the extra demand to be accommodated by the end of CP4:

- at main London termini (with peak period and peak hour load factors);
- in other urban areas (with peak period and peak hour load factors); and
- by strategic route (with no load factor).

9.75 Network Rail included £1.7bn of schemes in the SBP update to meet these requirements. Many schemes were at early GRIP stages and costs and project scopes were subject to considerable further development.

9.76 Network Rail provided calculations of incremental capacity associated with service improvements and the delivery of enhancement schemes. We asked SDG whether the schemes identified would be sufficient and necessary to deliver the HLOS. SDG's analysis focused on meeting the peak capacity specifications. This work necessarily involves judgement as well as quantified analysis. Although options may work in theory, we need to consider the operational reality and reach an overall view on a deliverable package.

9.77 For **London** SDG identified over 60 capacity initiatives. These were sorted by date to identify the cumulative build-up of capacity over time. This analysis was carried out separately for the peak hour and 3-hour peak period. The greatest capacity constraint is in the peak hour. The analysis for the peak hour is shown in figure 9.1. This illustrates that, in 2014, the proposed capacity initiatives are more than sufficient to meet the HLOS capacity requirement of 371,000 spaces.

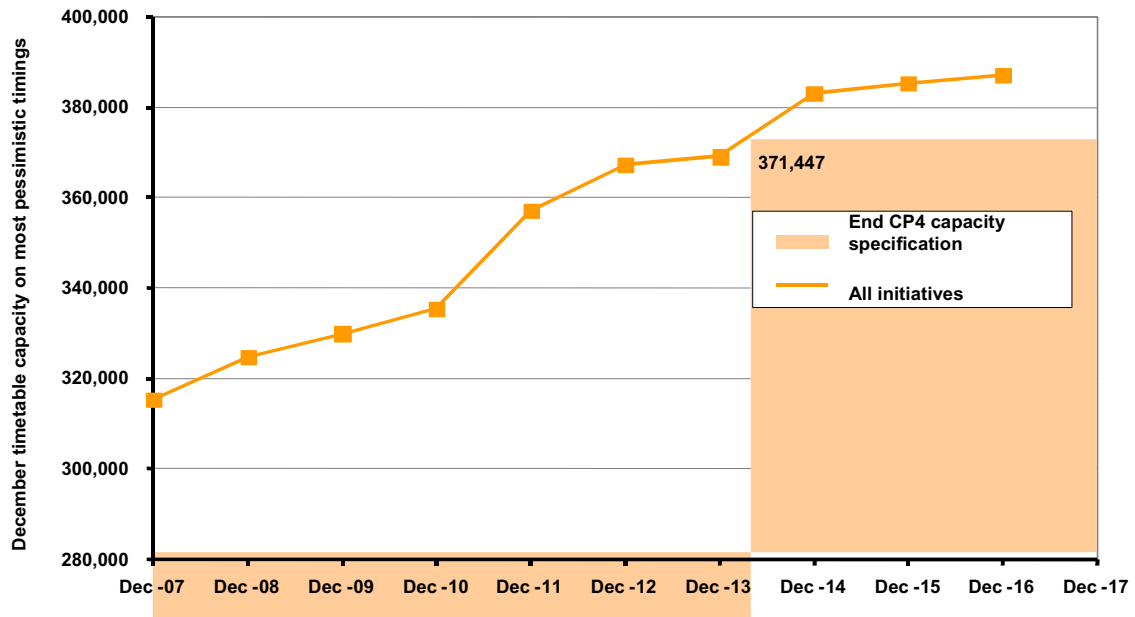


Figure 9.1: Build up of capacity at London termini, one hour peak

- 9.78 Our assessment of the SBP indicated that not all the proposed schemes are necessary to deliver the **HLOS London capacity** specification. We removed those that did not appear to be needed, and considered them later against the criteria described in paragraph 9.103.
- 9.79 The schemes for London have strong interdependence with the Thameslink works. These involve operating longer trains on a number of routes and therefore include platform lengthening and power supply upgrades. Details of the Thameslink project are still being refined, but we used the most recent functional specification to review overlaps with other proposed schemes. It includes platform lengthening on routes to Dartford and East Grinstead, and we have excluded the costs of these schemes here to avoid double counting.
- 9.80 While relatively expensive solely in terms of providing peak capacity into London we are satisfied that the schemes proposed for the East Coast main line are also required by the route (passenger-km) capacity specification.
- 9.81 We have undertaken a detailed efficiency review of individual HLOS capacity schemes. This has involved a review of unit rates and scope, removal of overlaps with Thameslink and the application of an efficiency trajectory.
- 9.82 There are a number of risks to delivery of the specification. It is important that rolling stock and infrastructure plans are aligned. DfT's rolling stock plans are subject to commercial negotiations with possible implications for infrastructure requirements. We cannot anticipate the outcome of these negotiations, but Network Rail must have visibility of progress and Network Rail's ability to deliver is dependent on how rapidly negotiations are completed.

- 9.83 Another risk is the restriction in capacity at London Bridge during Thameslink works. While details of the Thameslink proposals are yet to be finalised, if London Bridge were not to be fully available by the end of CP4, the capacity specification may not be met.
- 9.84 For **other urban areas** (including Birmingham, Cardiff, Leeds, Manchester and the 'other urban areas' category in the HLOS) SDG identified that the schemes in the original SBP over-deliver the HLOS specification:
- Birmingham: the specification could be met with around 60% of the proposed capacity increase;
 - Cardiff: the specification could be met without any of the proposed capacity increases;
 - Leeds: the specification could be met by the end of 2011, with the remaining schemes resulting in over delivery;
 - Manchester: the proposed schemes would result in a small over delivery of the specification;
 - For other urban areas (Bristol, Leicester, Liverpool excluding Merseyrail, Newcastle, Nottingham and Sheffield) the proposed schemes are just sufficient to deliver the specification.
- 9.85 The SBP update provides additional capacity, notably in Leeds and Manchester, so this over delivery grew bigger. We reviewed the schemes in the SBP update and identified a number that, on the evidence provided by Network Rail, we believe are unnecessary to meet the capacity specification. In the case of Cardiff we found that none of the proposed schemes were needed, although we considered them again later against the other criteria. In the case of Leeds we reduced Network Rail's cost allowance for route 10 from £94m to £60m and for Manchester we reduced Network Rail's allowance for route 20 from £99m to £60m. In both cases these numbers include depots and stabling provision. It is for Network Rail to set out exactly which schemes it intends to implement for Leeds and Manchester in its CP4 delivery plan.
- 9.86 As for London, the schemes required to meet the HLOS are dependent on DfT's rolling stock plans, as evidenced by substantial revisions to proposed schemes for Leeds and Manchester when indicative rolling stock allocations became clearer. There are also interdependencies between schemes and services in adjacent urban areas (e.g. Leeds and Manchester are served by both Northern and TPE, and rolling stock plans will need to be complementary with TPE services contributing towards the specification in both areas).

Capacity schemes – consultation responses

- 9.87 Several respondents stated that passenger demand growth would be higher than forecast in the HLOS and that the capacity enhancements proposed were either insufficient or the minimum required to accommodate growth.

- 9.88 Some respondents suggested that further schemes or expenditure were required just to meet the HLOS capacity metric.
- 9.89 Network Rail raised concerns with our analysis of capacity schemes:
- that Arup's platform extension costs under-estimated the work involved as they were based on physical rather than operational platform lengths, used standard descriptions of carriage lengths rather than exact values, did not allow for splitting and joining, excluded extensions on route 18 (West coast main line) and excluded associated work on other assets;
 - that Arup's power supply costs had incorrectly allowed for skewed risk distribution and optimism bias;
 - that additional funding was required for a number of schemes for example Gatwick, Clapham Junction and in Leeds and Manchester.
- 9.90 Network Rail accepted that some schemes and expenditure totalling £107million was not required by the HLOS.
- 9.91 Northern's response identified an alternative approach to meeting the HLOS metric in Leeds and Manchester at costs of £67m and £75m respectively (pre-efficiency), substantially less than the SBP proposals.

Capacity schemes – our conclusions

- 9.92 We have reviewed the additional evidence on platform lengthening provided by Network Rail and others, and Arup has reviewed its assumptions⁷⁶. We do not believe there are material inaccuracies in Arup's analysis, except on route 3 where we are assuming an additional 4m extension to each platform; this increases costs by £3m. We believe that further consideration of splitting and joining would make no material difference to the estimates. We have reviewed Arup's assumptions on associated works and have undertaken a number of site visits. We are content that Arup's assumptions are appropriate, except for route 5 where we consider there is a case for additional costs; we have increased our provision by £4m (post-efficiency).
- 9.93 We asked Arup to review its estimate of power supply costs. It concluded that there may be double counting in adjustments for skewed risk distribution and optimism bias and for efficiency. We have therefore removed the adjustments for skewed risk distribution and optimism bias. However Arup still considers that some of Network Rail's power supply costs are over estimated. We have increased provision for power supply costs by £12m (post efficiency).
- 9.94 We do not accept the case for increased funding for Clapham Junction. Some of the proposed works are part of a wider development intended to be funded by a developer; others would more properly be funded through renewals.

⁷⁶ *Advice on Network Rail's strategic business plan*, Ove Arup & Partners, 17 October 2008: This may be accessed at www.rail-reg.gov.uk/upload/pdf/pr08-arupsbp-171008.pdf

- 9.95 We have reviewed our allowances for meeting the capacity specification in Leeds and Manchester. Based on information provided by Northern we are content that additional expenditure is required in Manchester and have increased the allowance by £10m. But allowing for future efficiency we consider the original allowance of £60m for Leeds is still appropriate.
- 9.96 Most funding for additional depots and stabling in CP4, to support the increase in the number of vehicles, is outside this determination but has been allowed for in our affordability calculations (see Chapter 28). The main exception is Northern as the SBP included such funding here, reflecting the advanced state of discussions between Network Rail and Northern. Our draft determinations also included funding for depots and stabling for Northern.
- 9.97 We are continuing to include this provision in Network Rail's revenue requirements; Network Rail is explicitly funded to this level for such work. If subsequently Northern and Network Rail agree that depots and stabling should be provided through some alternative mechanism they will be able to agree suitable arrangements for this and we will reduce Network Rail's funding allowance accordingly.
- 9.98 We did not fully fund Network Rail's proposals for Gatwick Airport in the draft determinations as we considered that they were not required by the HLOS. Network Rail has subsequently indicated that it assumed that the track works were undertaken in its HLOS performance calculations. After checking this, we consider it appropriate to fund these works at a cost of £10m, hence our total provision is now £19m.
- 9.99 We are making no other changes to our draft determination.

Table 9.5: England and Wales HLOS capacity metric funding in CP4

| £m (2006-07 prices) | SBP update | Draft determination | ORR conclusions |
|--|---------------|------------------------|--------------------|
| HLOS London and other urban areas capacity metric | 1,449 | 573 | 610 |
| Passenger-km and HLOS London capacity metric | | 433 | 433 |
| Risk | 237 | 177 | 184 |
| Total | 1,685 | 1,184 | 1,227 |

Note: numbers may not add due to rounding.

Performance schemes

- 9.100 Network Rail proposed a fund of £250m to bridge the gap between the HLOS performance specification and the improvements it believes it can deliver from its core funding. This is described in more detail in annex C.
- 9.101 As explained in the annex, we believed the gap between the target and what can be delivered by Network Rail's core initiatives is smaller than Network Rail has calculated. We have also identified an alternative package of measures to bridge the gap which is less expensive than Network Rail's proposals, with scope for further cost reductions through efficiencies.
- 9.102 We concluded that the funding to deliver the performance improvements should be £160m (£96m capital and £64m non-capital expenditure). The annex includes the consultation responses we received and our determination.

Enhancements in England & Wales required to give full effect to the HLOS

Other enhancements – draft determinations analysis

- 9.103 We then reviewed all remaining projects in the SBP update (including any which had been proposed to meet specific elements of the HLOS but which we concluded were not necessary for this) to determine whether they were justified and necessary in CP4 to give full effect to the HLOS in its statutory and regulatory context, and in particular Network Rail's obligations under condition 7 of its network licence. We applied the following criteria:
- we would not fund projects whose primary benefit would be to improve performance or capacity beyond levels explicitly specified in the HLOS;
 - we would take account of the need for a sustainable plan and the longer term needs of the railway, for example in deciding whether a fund should be available for developing options and initial project development for CP5;
 - there must be evidence that projects offer value for money; and
 - the projects should be deliverable – to assess this we considered whether the project would draw on resources that Network Rail had identified as being scarce.
- 9.104 Annex D includes full details of the schemes we assessed. The following paragraphs outline the projects which we concluded met our criteria.

Schemes which provide journey time improvements – draft determinations analysis

- 9.105 The following schemes for improved journey times have, on the basis of our assessment of efficient costs, strong financial and economic justification and should be undertaken by a best practice network manager:
- **Westerleigh - Barnt Green:** improvements to a stretch of the western route to reduce journey times between Birmingham and Bristol;

- **Chiltern:** small scale line speed improvements to reduce journey times;
- **St Pancras to Sheffield** line speed improvements: a package of track, signalling and junction remodelling to reduce journey times by around 10 minutes; and
- **Trans Pennine** line speed improvements: track, signalling and structures works to enable faster journey times between Liverpool and Manchester and between Manchester and Leeds.

Other schemes with strong business cases driven by revenue benefits – draft determinations analysis

9.106 **East Coast overhead line renewal.** In addition to works being carried out in CP3 and those included in the core CP4 renewals programme, Network Rail proposed further works to reduce the risk of service disruption from overhead line failures. The financial and economic case for the incremental investment is good; it is also projected to take PPM for the TOC above 90% by the end of CP4, meeting the HLOS requirement that individual TOC performance should not fall far below the specification for the whole sector.

9.107 The **North Cotswolds** scheme involves partial redoubling of single line track between Oxford and Worcester and associated works at platforms and to bridges. This is to deliver performance benefits on the Cotswold line and consequent improvements along the Thames valley and the financial case is good. It would also bring First Great Western performance to over 90%, closer to the sector HLOS specifications.

9.108 **Seven day railway:** The SBP includes initiatives to reduce disruption from engineering works through increased efficiencies. The seven day railway concept goes beyond that to achieve further reductions in disruption by changing methods of working, even where this requires additional capital or maintenance expenditure.

9.109 Network Rail proposed expenditure of £350m to implement the concept initially on eight routes including the East Coast and Midland Main Lines. Capital costs include installation of crossovers and bi-directional signalling to facilitate single line working past engineering works. Recurring costs include additional costs of staff protection for new methods of working and additional resources to deliver equivalent work volumes in shorter possessions.

9.110 We believed the one-off costs were overstated because they include items such as asset condition monitoring which are already funded in the core plan, and because some track and signalling works in the case study routes are overspecified. Recurring costs are estimated using a generic model which we believe is likely to be overestimating them.

9.111 Network Rail claimed that passenger revenue benefits (from increased services on Sundays) could build up to more than £100m a year for the whole network and that there would be additional freight revenue. We believed that part of the passenger and freight revenue benefits should be attributed to

improvements already funded in the core plan, and that these figures were overstated. We considered that further increases in freight revenues would be achievable only if whole freight routes receive the benefit of the seven day railway; it will be important that seven day railway initiatives are carefully designed so that they do not increase disruption to freight services.

- 9.112 On the basis of our assessment of likely costs and benefits we believed the evidence showed a good financial case for the seven-day railway on suitable parts of the network.
- 9.113 Work on detailed plans for most individual routes is at an early stage, so we were unable to fund a defined package of seven-day railway works at this stage. However we believe that it is important that this initiative gains momentum and that significant benefits are realised as early as possible. We therefore included funding for £160m of capital expenditure and £60m of additional maintenance and renewal costs in CP4.
- 9.114 We required Network Rail to continue to develop route-specific plans to implement this initiative, which will need to show an incremental improvement in network availability. These should, as far as possible, be completed and included in the CP4 delivery plan.
- 9.115 We also concluded that there were good business cases for **Redditch branch enhancement** increasing capacity to allow more frequent services to Redditch, and for electrification of the line between **Barnt Grove and Bromsgrove** to allow the extension of cross-city services from Longbridge to Bromsgrove.

Other schemes which have a good business case – draft determinations analysis

- 9.116 **GSM-R coverage of freight only lines.** The GSM-R project as currently funded excluded freight-only branches on the basis that there were very low risks involved. Subsequent analysis by RSSB indicates that some such lines carry dangerous goods or significant levels of traffic and that they should be considered as requiring radio coverage. Network Rail estimates that the cost of providing coverage on these lines is £32m but identified potential £7m savings by reducing coverage to NRN levels. We considered this additional work should be funded but our analysis indicated that further reductions are possible and that the funding required could be reduced to £20m (£17m of which would be in England & Wales). This additional work will have to be integrated into the national implementation to obtain maximum efficiencies.
- 9.117 **DC regeneration** allows electrical energy generated by a braking train to return to the conductor rail and to be used by other accelerating trains in the vicinity. The AC (overhead line) electrified network is already regeneration capable and can achieve 15-25% saving in energy. Slightly lower but still worthwhile savings can be achieved on the DC network but regeneration is slightly more complex and requires changes to parts of the infrastructure. This scheme will fund those changes, in particular the power supply shared with London Underground Limited (LUL) in Southwest London will be separated to

allow increased voltage on the Network Rail infrastructure. Network Rail estimates the cost to be £27.6m (post-efficiency). We considered this to be reasonable and included it in our allowances. The main risks to the project are associated with the separation of the two supply systems if LUL perceives that its operations may be affected adversely.

- 9.118 **Station security:** Network Rail has proposed expenditure of £18m on projects to prevent vehicle incursions at its managed stations, with the support of Government. We have made a full allowance for this. We did not make an allowance for SISS as Network Rail viewed this expenditure as discretionary and not required to deliver the HLOS.
- 9.119 **North London Line:** a contribution to funding the major TfL North London Line project by advancing certain renewals including track layout, resignalling and structures work. The cost of bringing forward this work will be paid by TfL but the renewals themselves will need to be funded by Network Rail. On advice from Network Rail we reduced the proposed funding contribution from £44m to £28m which we consider to be reasonable.
- 9.120 Network Rail proposed a **project development** fund of £240m, including £60m for the Manchester hub. It did not explain how this figure was arrived at. We do not believe there is evidence to justify this size of fund when there are mechanisms for adding project development expenditure to the RAB during the control period. However we do believe that Network Rail should be provided with some funding for optioneering and the early stages of project development. We made an allowance of £50m for this. Network Rail has said that it wants to involve the industry in how this fund is used. We welcome this and look to Network Rail to put forward plans for how this will work.

Other enhancements - consultation responses

- 9.121 We received a number of representations suggesting that we should provide funding for particular schemes through the periodic review. The most numerous related to Swindon – Kemble, East Midlands re-signalling and additional funding for Gatwick Airport (covered above). ATOC suggested funding of around £150m for one or two small-scale electrification schemes.
- 9.122 Network Rail requested additional funding of £1bn. This did not cover funding for schemes that we omitted entirely in the draft determinations; Network Rail said that it would work with industry partners to seek alternative sources of funding for these. But it stated that there was a good case for funding enhancements to renewals schemes (including Gatwick and East Midlands resignalling) as these represented an opportunity to undertake the proposed enhancement at lower cost. Network Rail also asked that we meet its original funding request for the seven day railway, the project development fund and policy options. It advised that the costs of relocating Bromsgrove station should be excluded as third party funding would cover this.

Other enhancements – our conclusions

- 9.123 We have reviewed the case for each of the schemes not specifically funded in the draft determinations.
- 9.124 We did not provide funding for East Midlands resignalling as Network Rail did not provide a convincing business case; the scheme was principally a performance scheme and Network Rail did not identify it as required to meet the HLOS. Subsequent to its response, Network Rail has provided additional information, has reduced the funding sought from £19m to £9.8m, and has provided a business case indicating that the scheme is value for money. We are also now satisfied that Network Rail assumed the performance benefits of the scheme in its calculations to meet the HLOS. We therefore consider that the revised scheme meets our criteria and we have included funding for it.
- 9.125 We received many letters about the Swindon-Kemble redoubling project. In its SBP update Network Rail proposed this primarily to improve performance, but said that the scheme was not required to deliver the HLOS targets. We did not fund it in our draft determinations because we said 'we would not fund projects whose primary benefit would be to improve performance or capacity beyond levels explicitly specified in the HLOS'. Network Rail has provided no further evidence to support the scheme. If funders subsequently decide to support the project it can be taken forward through the investment framework.
- 9.126 Removing the costs of Bromsgrove station relocation and associated works reduces the electrification scheme costs by £8m to £16m.
- 9.127 After reviewing the case for the other schemes we do not consider that they should be funded as part of this determination.
- 9.128 Although it is increasingly recognised that substantial further electrification may have a good business case, this was not called for by either HLOS nor did Network Rail include proposals in its SBP and SBP update. There is therefore no basis for this review to make positive provision for such further electrification. However, if plans are developed to the stage of demonstrating a sound case and commanding the necessary support from funders during the course of CP4, our overall investment framework will provide the means for these to be progressed without having to wait for the next periodic review.
- 9.129 We are surprised that Network Rail has requested additional funding for the seven-day railway. Our original assessment was largely based on an ATOC - Network Rail agreement that reduced the estimated cost of implementation for the ECML and Great Eastern routes. Since the draft determinations, Network Rail has said the cost of other routes has increased, although we only made a small reduction to its original request for these routes. We do not consider that Network Rail has made the case for additional funding and therefore consider our original allocation reasonable.

- 9.130 Network Rail has failed to make a compelling case to increase funding for project development; we have retained our original allowance.
- 9.131 We are surprised that Network Rail has requested full funding for policy options. Most of our proposed reduction was on the basis of not funding the SISS renewals. Network Rail has asked that we fully fund this work at a cost of £102m despite also asking for the same work to be funded under renewals, albeit at a lower cost of £42m. We still do not consider that SISS renewals should be funded in this review.
- 9.132 We consider that our original funding determination of £20m for GSM-R/FTN freight-only lines remains an appropriate value for the efficient inclusion of this work into the main GSM-R/FTN project.
- 9.133 Network Rail has asked to carry over £172m of unspent funding from the safety and environment plan to CP4 to deliver additional outputs and complete work currently being undertaken. We have reviewed this proposal and consider that £110m of the expenditure is genuinely incremental to that included in the SBP update. We have therefore included an allowance for this.

Enhancements in Scotland

Scotland HLOS

- 9.134 The Scotland HLOS sets out requirements in three tiers:
- 9.135 **Tier 1** requires Network Rail to: maintain a base level of capacity and capability of the network; the ScotRail franchise to achieve an annual average PPM of 92% by the end of CP4; fund small-scale interventions of up to £20m over CP4; and progress the projects listed in Tier 3 to GRIP 1.
- 9.136 **Tier 2** sets out major project requirements as follows:
- Airdrie to Bathgate;
 - Glasgow Airport Rail Link (GARL), and
 - Borders Railway.
- 9.137 **Tier 3** sets out projects to be developed.

Network Rail's proposal

- 9.138 Network Rail's SBP sets out £448m of enhancement expenditure in Scotland.

Table 9.6: Network Rail's enhancement proposals in Scotland

| £m (2006-07 prices) | SBP update |
|---------------------------|------------|
| Airdrie – Bathgate | 185 |
| Glasgow Airport Rail Link | 173 |
| Borders Rail | 3 |

| £m (2006-07 prices) | SBP update |
|--------------------------------|------------|
| Glasgow to Kilmarnock | 12 |
| Tier 3 project development | 13 |
| Small projects fund | 20 |
| Total core projects | 406 |
| Seven day railway (Scotland) | 30 |
| Policy choices | 12 |
| Total optional projects | 42 |
| Total | 448 |

Our assessment - draft determinations analysis

- 9.139 The **Airdrie-Bathgate** scheme will provide a new double track railway largely along the line of the former railway between Bathgate and Drumgelloch / Airdrie to create a fourth direct rail link between Edinburgh and Glasgow. The key objective is to provide a 4tph passenger service between Edinburgh and Glasgow. Transport Scotland proposed that Network Rail undertakes the scheme for a fixed price. On 22 January 2008 we set out our view of an appropriate fixed price for the scheme of £321m (Q1 2006 prices). Network Rail's SBP update cost estimate of £185m is consistent with our view of the fixed price. The increase of £40m over the SBP reflects some slippage of costs into CP4 and the risk premium for moving to a fixed price basis.
- 9.140 The scope of the fixed price did not allow for input price inflation. Consistent with our treatment of other schemes we consider it appropriate to allow for input price inflation in scheme costs and have allowed an additional £4m in our cost allowances for this scheme, giving a total CP4 cost of £189m. This cost does not allow for the additional input price inflation incurred due to deferral of expenditure from CP3 to CP4
- 9.141 **Glasgow Airport Rail Link (GARL)** will provide a direct rail link from Glasgow Central to a new station within Glasgow Airport's boundary. The key objective is to provide four trains per hour between Glasgow city centre and the airport with a journey time of 16 minutes. The project incorporates the costs of delivering the Paisley Corridor Signalling Renewal project. The project was originally promoted by Strathclyde Partnership for Transport (SPT) but has transferred to Transport Scotland. Based on an initial review Network Rail estimates scheme costs of £173m for CP4. We understand that this cost includes P80 risk allowance, optimism bias of 10% and input price inflation. We are concerned that this could double count risks although we note that Transport Scotland has guided Network Rail to include this allowance. Transport Scotland has reviewed Network Rail's estimate and suggests that total project costs could be reduced by 24% or £40m.
- 9.142 We undertook a review of Network Rail's cost estimates and considered that they could be over-estimated by 15% or £26m. Further, consistent with other

projects, we did not consider that Network Rail's cost allowance should include optimism bias. We therefore reduced Network Rail's proposed cost allowance to £135m. There are a number of risks to the project in part due to interdependencies with other schemes such as the branch line works that are being delivered by SPT and other projects being delivered by Network Rail such as Glasgow central interlocking project, Shields Junction renewals and Ayrshire and Inverclyde renewals.

- 9.143 The **Borders** railway scheme will provide a new railway track with two trains per hour between Tweedbank and Newcraighall. After publication of the HLOS, Transport Scotland decided that a third party would deliver the Borders railway. Network Rail's cost estimate of £3m reflects the costs of asset protection and we considered that this is reasonable.
- 9.144 The **Glasgow to Kilmarnock** scheme, which is under way, enhances capacity between Glasgow and Kilmarnock in particular by re-instating a two track railway over 7 miles to create a loop to allow two trains per hour to be operated in both directions. Network Rail estimates total project costs of £25m, of which the SBP update estimated £12m would be in CP4. We therefore included £12m in our calculations.
- 9.145 Network Rail included a £20m **small projects fund** as specified in the HLOS. We included £20m at 2006-07 prices in our determination.
- 9.146 Network Rail included £13m to **progress Tier 3 projects** to GRIP stage 1. This cost appeared reasonable and we therefore included it in our determination, as £13m at 2006-07 prices.
- 9.147 Network Rail included £42m of funding for optional projects including the seven day railway. Current proposals for the seven day railway indicate that only 8 routes are to be implemented in CP4, of these only the ECML would incur any costs in Scotland and these costs are expected to be very small. We therefore proposed not to include a cost allowance for this in CP4.
- 9.148 Network Rail has not broken down its £12m cost estimate for **policy choices** which we understand reflects a combination of station information and surveillance systems (SISS) and GSM-R on freight only lines. In line with our estimates above we included £3m for GSM-R and nothing for SISS.

Enhancements in Scotland – consultation responses

- 9.149 In Scotland Network Rail challenged our cost reductions for GARL and Airdrie-Bathgate. On GARL Network Rail challenged our reduction in signalling costs, project management costs and the consequent change to sunk costs. We note that although Network Rail appears to have accepted our removal of optimism bias it has still included this in its additional funding request of £1bn. On Airdrie Bathgate Network Rail has challenged our removal of input price inflation from deferred costs.

Enhancements in Scotland – our final conclusions

- 9.150 Consistent with our approach for England and Wales we have not included an additional allowance for policy choices or the seven-day railway.
- 9.151 Network Rail has provided a new GARL cost estimate of £166m (including risk and input price inflation), £156m of which would be in CP4. This compares to £173m in the SBP update. We have used the revised estimate as the basis for our determination. Network Rail has reduced signalling costs from £66m to £54m (our draft determinations assumed £38m). However, we believe Network Rail has made errors in adjusting for inflation and that the correct figure should be £47m, with consequent adjustments to project management, design and other on costs. In total this gives a revised CP4 cost estimate of £146m, an increase of £11m over our previous figure.
- 9.152 On Airdrie-Bathgate we have increased our CP4 allowance by £2m to £191m.
- 9.153 As Glasgow Kilmarnock has, up to this point, been funded on an emerging cost basis we have included Network Rail's proposed increased CP4 cost allowance of £13.8m (an increase of £1.8m on the draft determinations).

Summary

9.154 Table 9.7 summarises the funding provision included in this determination, and compares it with the proposals in the SBP update.

Table 9.7: Funding for CP4 enhancements

| £m (2006-07 prices) | SBP update | Draft Determinations | ORR determination | of which deferrals from CP3 |
|--------------------------------------|--------------|----------------------|-------------------|-----------------------------|
| England and Wales | | | | |
| England & Wales HLOS | 7,328 | 6,561 | 6,667 | 66 |
| Other England & Wales projects | 1,253 | 571 | 681 | 110 |
| Sub-total England & Wales | 8,581 | 7,132 | 7,348 | 176 |
| Scotland | | | | |
| Scotland HLOS | 406 | 372 | 387 | 0 |
| Other Scotland projects | 42 | 3 | 3 | 0 |
| Sub-total Scotland | 448 | 375 | 390 | 0 |
| Total network | 9,029 | 7,507 | 7,739 | 176 |

Note: totals may not sum due to rounding.

10. Network Rail's ability to deliver the CP4 capital programme

Introduction

- 10.1 We need to be satisfied that the obligations which this determination places on Network Rail are likely to be deliverable. In the draft determinations we considered the ability of Network Rail, and its supply chain, to meet the major challenge of delivering the enhancements programme (which is much larger than its equivalent in CP3) at the same time as the renewals programme (which is broadly similar to that in CP3 once the expected improvements in efficiency in CP4 are taken into account). In CP4 this determination provides for Network Rail to carry out £18.4bn of capital expenditure (£10.8bn on renewals and £7.6bn on enhancements) compared with £17.5bn in CP3 (£14.2bn on renewals and £3.5bn on enhancements).
- 10.2 Our assessment focuses on Network Rail's ability to meet its obligations. But we stress that we are not telling Network Rail *how* it should operate to do this; that is for the company to decide.
- 10.3 Achieving the full benefits of the enhancement programme will also depend on others, particularly funders and train operators who need to progress new train orders and complex cascades of rolling stock around the network. Effective cooperation will be needed between all parties.
- 10.4 In this chapter we review the analysis that we carried out for the draft determinations and the responses we received to our consultation. We update our assessment in the light of those responses and the further information we have received from Network Rail.

Draft determinations analysis: factors affecting capability

- 10.5 In the draft determinations we said that we had asked Network Rail to demonstrate how it had satisfied itself that it would be capable of delivering the programmes included in the SBP update (including Crossrail which, although not formally part of this determination, will clearly add to the delivery challenge if it proceeds on the timescale proposed). This capability is affected by the following factors:
- people: the skills of the people available to do the work;
 - supply chain: capacity and capability of the wider industry;
 - organisation: the leadership, structure and culture of the company;
 - processes: the way in which Network Rail takes decisions; and
 - wider influences: e.g. competition from other sectors of the economy, and the impact of factors such as the planning process.

People and supply chain capability

- 10.6 Network Rail provided us with a detailed analysis of the demand for resources in different asset categories such as track, signalling and telecommunications. For each asset category it provided an assessment of its capability along the 'value chain' (ranging from design to installation).
- 10.7 The company had clearly made considerable progress in recognising the scale of the challenge, analysing and developing its capability and in working with the supply chain. Overall Network Rail noted the need to manage critical resource constraints in areas such as signalling and electrification specialists, but believed that its delivery plans were robust.
- 10.8 We noted that Network Rail's plans had a particular impact on electrification resources, where there is an increase in planned activity affecting both distribution and overhead line works. In the case of distribution, rail demand is part of a larger market and the supply base is expected to be able to absorb the increase. Overhead line work requires specialist skills and there is already little spare capacity. The company intended to make more use of wiring trains to increase productivity and to manage the critical resources more closely.
- 10.9 The signalling programme was also an area where the supply base needed careful management. Network Rail has said that the uneven profile of work caused some risks, but that it believed the planned volumes to be deliverable by careful scheduling.

Organisation and process capability

- 10.10 We found that, again, the company had made substantial progress in assessing its own capability, addressing weaknesses, and developing further plans in areas where there is still a projected shortfall against requirements.
- 10.11 The company had provided us with its plans for organisational development, a programme to speed up the project development process, and plans to improve change and quality control.
- 10.12 It was clear that, in some areas, such as implementation of the seven day railway concept, Network Rail would have to make substantial changes to the way it works. It showed us its plans to change its approach to possessions, emphasising that the transition will be phased and that detailed work continues to refine plans. Very close working with operators would be needed.

Wider influences

- 10.13 Network Rail had analysed the competition for resources from other large construction projects which are planned, many of them in the South East where resources are often already stretched. Although Network Rail's programme of works is large, many parts of it (e.g. civil engineering work) are relatively small parts of wider markets.

10.14 Some enhancement projects require planning permission, and a few need Transport and Works Act (TWA) powers. Our consultants on enhancement projects, SDG and Arup, both felt that Network Rail had underestimated the time required to obtain TWA powers, which would put delivery dates at risk.

Draft determinations: our assessment

10.15 Overall, we were encouraged by the significant advances Network Rail had made in understanding the potential problems, making changes to the way it works, and planning for the future. However, we decided to carry out a further short review of whether Network Rail was doing enough to develop its delivery capability.

10.16 We commissioned Nichols to undertake this work⁷⁷. Nichols pointed out that assessing capability requires a clear understanding of what needs to be delivered. Because around half of the enhancement programme (by value) was still at an early stage of development, the actual requirements were not well defined. Nichols made ten recommendations, and we asked Network Rail to respond to these.

10.17 The three recommendations which Nichols categorised as fully within Network Rail's control covered developing:

- an overall capability development program;
- high-level resources master plans; and
- a more effective capability maturity model.

10.18 Network Rail agreed that an overall capability development programme with high-level leadership is needed to better integrate the individual change programmes and ensure initiatives can be prioritised. We welcomed this. Network Rail believed that it already had an appropriate resources master plan and made appropriate use of the capability maturity model.

10.19 Nichols made four recommendations for Network Rail that would need the support of other parties:

- consider re-phasing of planned delivery;
- establish, with suppliers, priorities for skills development;
- seek cross-industry collaboration between clients of major programmes; and
- design an effective project monitoring system.

10.20 Network Rail had already considered its planned delivery and believed its plans were appropriate. We recognised that specific outputs and milestones would not be firmed up until the CP4 delivery plan is published.

⁷⁷ *Rapid review of Network Rail's capability to deliver its increased programme of enhancements*. The Nichols Group, April 2008. This may be accessed at www.rail-reg.gov.uk/upload/pdf/pr08-nicholscap-220408.pdf.

- 10.21 Network Rail already had a number of initiatives in place for skills development and cross industry collaboration. It had begun work on plans for project monitoring in CP4 but recognised that this was at an early stage.
- 10.22 There were three Nichols recommendations that Nichols said were for other parties to lead.
- develop and implement a change control process for CP4 enhancements;
 - review the supervisory roles of ORR and funders to ensure effective cross-industry coordination; and
 - set targets for the development of CP4 projects.
- 10.23 We had set out our proposals for change control in the draft determinations, and Network Rail was broadly in agreement with this (see chapter 4 for a fuller description of this). We noted that we were working closely with funders and would continue to do so.
- 10.24 We also noted that timely project development is essential to the success of the programme. We had discussed this with Network Rail, and we said we would require the company to provide revised plans with milestones for reaching GRIP stages so that we could monitor progress during the remainder of CP3 – this would also bring a strong focus on the issue of obtaining planning permission.
- 10.25 Overall, in the draft determinations we welcomed the progress that Network Rail had made in developing its understanding of the delivery challenge and of its ability to meet it.
- 10.26 We concluded that, while the scale of the capital programme we intended to fund through this determination represented a real delivery challenge to Network Rail, with two exceptions it should not be necessary for us to cut back the funding or the required outputs on grounds of deliverability.
- 10.27 For certain planned works within the West Coast Route Modernisation programme we reduced the proposed CP4 funding because the evidence suggested that these projects could not be progressed as quickly as the SBP assumed. We also made a small reduction in the volume of signalling renewals we proposed should be funded.
- 10.28 Chapter 30 explains how we will approach monitoring for CP4 so that, if delivery of Network Rail's obligations is at risk, this is identified and tackled in a timely and effective way.

Consultation responses and further analysis

- 10.29 Some consultees expressed their doubts about Network Rail's ability to deliver its capital programme, while DfT said that ORR should monitor Network Rail's capability to deliver.
- 10.30 Network Rail has provided updates on the progress though GRIP stages of its enhancement programme and an update on its capability development.

- 10.31 Although the GRIP analysis shows that Network Rail is continuing to make progress it did not provide us with the assurance we needed, being incomplete and difficult to interpret. Discussions with Network Rail to resolve these problems demonstrated that information flows within the company are not functioning as they should, which raised questions about how Network Rail itself could be confident about its delivery capabilities.
- 10.32 Network Rail has also provided us with details of further proposed deferral of enhancement expenditure from CP3 to CP4, confirming doubts about the robustness of its current delivery plans.
- 10.33 Because of these doubts we required Network Rail to provide further information on:
- the detailed planning for projects shown to be spending in 2009-10 including possessions planning, handling the network change process and planning risks;
 - more detailed project plans for certain projects; and
 - details of capability development for the major project teams.
- 10.34 We received further information in these areas but also, very late in the process on 8 October, a new proposal from Network Rail on the profiling of enhancement expenditure in which it said:
- ‘There are a number of reasons why risks and uncertainties remain but we believe these are risks related to the rate of development of projects and progress in ramping up our resources rather than overall deliverability and we do not believe the delivery of overall outputs is in jeopardy’
- 10.35 Network Rail proposed that enhancement expenditure should be reprofiled, reducing by £100m in 2009-10 and adding back this sum spread over the next two years. This represents some 4-5% of its proposed enhancement expenditure in 2009-10.

Conclusions

- 10.36 For the purposes of this determination we need to take a decision on:
- the scale of Network Rail's enhancement programme. Can Network Rail actually deliver to meet the full obligations it would face under this determination?; and
 - the profiling of the expenditure, particularly in the early years.
- 10.37 The scale of the programme we are providing funds for is less than Network Rail itself proposed in its SBP update. It should therefore be more within the company's capability to deliver.

- 10.38 We believe that Network Rail's enhancements expenditure should be reprofiled by deferring expenditure planned for 2009-10 to later in CP4. In addition to the £100m deferral suggested by Network Rail we have identified around £35m of specific expenditure scheduled for 2009-10 that the evidence available to us suggests cannot be spent in that year. We are therefore providing for a deferral of £135m out of 2009-10 into the following two years.
- 10.39 Of course this increases the scale of the delivery challenge in later years. Network Rail cannot afford to lose momentum on its capability development and we need to monitor the company's programme to establish whether or not it is likely to deliver as we progress through CP3 and CP4.
- 10.40 We are therefore requiring Network Rail to provide further regular information to us and we will commission further independent reviews as appropriate to maintain a sharp focus on this area.

11. Safety management

Introduction

11.1 This chapter explains the work we have undertaken in making our determination to take account of the need to maintain safety. This work has fallen under three broad headings:

- a general assessment of Network Rail's SBP;
- input to establishing efficiency assumptions; and
- assessment of the industry's plans to deliver the HLOS safety specification.

Background and approach

11.2 The continued safe operation, maintenance, renewal and enhancement of the mainline rail network is of primary importance both, narrowly, in meeting legal obligations and, more broadly, in meeting public expectations and maintaining confidence in a key element of the national transport network. For these reasons safety has been a primary consideration in the conduct of PR08. In carrying out our work we have been mindful of:

- our key roles of securing compliance by duty holders with relevant health and safety law and encouraging continuous improvement in health and safety performance; and
- our duty under section 4 of the Railways Act 1993 to take into account, in carrying out our functions, the need to protect all persons from dangers arising from the operation of railways.

11.3 While it is clearly the responsibility of Network Rail to manage its business in a way that enables it to meet its legal obligations, including safety obligations, alongside the delivery of the reasonable requirements of its customers and funders, it is equally our responsibility to ensure that Network Rail is not put in a position where it is unable to continue to meet its health and safety obligations.

11.4 Our aim, therefore, in making our determination for CP4, has been to ensure that the overall package we have established, whilst challenging and incentivising Network Rail to become more efficient in running its business and deliver the outputs will, nevertheless, not prevent Network Rail from continuing to meet its health and safety obligations.

Assessment of the SBP

11.5 We have reviewed the safety aspects of the SBP in order to:

- assess Network Rail's plans for complying with its health and safety legal obligations over CP4;
- ensure that Network Rail has identified any changes in risk arising from the organisational and operational changes it needs to make to deliver its required outputs in CP4, and has plans for managing these changes in risk; and
- assess whether the plans presented by Network Rail on behalf of the industry are sufficient to deliver the HLOS safety specification.

11.6 Building on our assessment of Network Rail's ISBP, in February 2007 we provided guidance to Network Rail on what we expected the SBP to cover in relation to safety matters. We asked Network Rail, among other things, to:

- state explicitly its strategic vision for safety;
- provide costed safety-specific initiatives for each area of safety risk, showing the consequent risk reduction;
- provide details of the risk reductions resulting as a secondary benefit from other activities and output improvements;
- show how improvements in risk had been extrapolated from recent trends;
- show where its plans required any material changes to the management of safety during CP4; and
- explain the implications for the management and measurement of safety where asset management regimes (including policies and overall levels of expenditure) might affect safety.

11.7 We undertook an assessment of the SBP, which included a number of meetings with Network Rail. In summary we considered that:

- the SBP was not strategic from a safety perspective, in that it did not set an end point or strong direction nor was there the coherence of actions necessary to deliver strategic objectives;
- the SBP did not contain evidence that initiatives proposed in the plan had been assessed for safety implications. Given that the changes to the railway required for CP4 and meeting 'challenging' targets is dependant on significant changes to technology, processes and workforce performance, we considered that the SBP did not give us assurance that the changes had been fully assessed by Network Rail's Safety and Compliance Function;
- the safety trajectory dealt with the railway as it is and did not deal with changes during CP4, such as the planned increase in traffic levels and the effect of this on access for inspection and maintenance. We considered that a consequence of such changes was that employee safety would be a major consideration during CP4, but we did not consider that this was adequately addressed in the SBP; and

- the SBP has implications for health and safety within Network Rail and on overall rail system risk, but it was not evident to us how this system risk had been assessed and planned for. We also observed that delivery of the plan depended on other duty holders, but the plan did not give details of the management of system risk nor the apportioning of risk controls, costs and funding with other duty holders.

Input to establishing efficiency assumptions

11.8 Whilst we have considered safety across all aspects of our work in PR08, we have given safety particular consideration during work to develop our assumptions on the efficiency improvements we consider that Network Rail can make in CP4 (set out in chapter 8). This has been achieved by:

- involving our safety directorate in our assessments of Network Rail's SBP and our specific work to examine the scope for efficiency improvement; and
- ensuring that the judgements we have made on efficiency improvements for CP4 are consistent with our expectations of Network Rail's ability to manage and deliver the sorts of change likely to be required of it.

Our assessment of Network Rail's proposals

11.9 Overall, we think that the SBP is capable of delivering effective standards of health and safety. However, in CP4 Network Rail will need to go beyond plans laid down in the SBP to make further changes to how it operates in order to deliver the greater efficiencies we assume are achievable whilst improving safety at the same time.

11.10 Network Rail will undertake a number of major, and in some cases new, initiatives, many of which have a potential impact on safety. A number of these initiatives are, as yet, at a relatively early stage of development and/or are unproven in use on the British rail network. We are concerned that the SBP does not give adequate assurance that the safety implications of the various initiatives have been fully identified and, therefore, that all appropriate risk control measures have not yet been developed.

11.11 Another issue is that Network Rail's role in the industry has changed since the introduction of the Railways and Other Guided Transport Systems (Safety) Regulations (ROGS) 2006; it is now the Infrastructure Manager rather than the Infrastructure Controller. A consequence of this change is that the balance of responsibility for the delivery of the safety of the railway system has shifted from Network Rail towards joint responsibility with train operators. System safety during CP4, and delivery of the HLOS safety specification, will be dependant not only on delivery of the SBP, but also on train operators meeting their responsibilities including their commitments to the Railway Strategic Safety Plan. How these new responsibilities are discharged and how the revised arrangements for co-operation work is still somewhat unproven.

11.12 There are a number of specific issues that we are continuing to discuss with Network Rail:

- **organisational culture:** the delivery of the SBP will require a high level of performance by Network Rail and its industry partners. The delivery will be highly dependant on the organisational (safety) culture. Network Rail is active in this area and will need to continue in order to achieve the frontline performance and plans and improve its safety culture;
- **asset management:** there will be a continuing need to develop strategic approaches to asset management that deliver coherent rail system performance on safety. The move to differential policies based on risk presents benefits, but also the challenge of moving from a rule-based to a risk-based culture. Adequate and safe engineering access is important, and routes with greater levels of traffic and enhanced permissible speeds, will require different models of track access and working methods; and
- **resources and competences:** the changes to the railway during CP4 will redefine the resources and competences required to deliver the plan. Network Rail will need to consider how it will, for example, deal with projected shortages of skills staff in the south east during CP4, including the demand for anticipated resources to deliver the 2012 Olympics, and maintain and improve the competence of existing and new staff. Network Rail is addressing this as part of the capability development programme described in chapter 10.

Conclusions

- 11.13 Overall, following this work, we think that the efficiencies we have assumed that Network Rail can achieve in CP4, whilst challenging, are deliverable safely, in line with our expectations of a well managed company. To do so, Network Rail will need to ensure that it has a management capability to control any health and safety risks arising from both the extent and rate of change necessary. We will expect that the initiatives laid out in the SBP (and any others, as necessary) are properly implemented with a rigorous change management program.
- 11.14 Through our safety regulatory function, we will continue to monitor Network Rail's response to the health and safety challenges in CP4. In particular, we will inspect and audit the company's arrangements to implement risk control and change management in those areas where we have residual safety concerns. Through this activity we will be able to identify any weaknesses in Network Rail's actions in those areas and, if deficiencies are found, take action.
- 11.15 Clearly, this is not an exhaustive process and it is not our responsibility to map out for Network Rail exactly how it should deliver safety and efficiency side by side.

Assessment of the industry's plans to deliver the HLOS safety specification

11.16 The HLOS safety specification, which covers the whole of Great Britain and is specified by the Secretary of State for Transport, requires that by the end of CP4 there should be:

- a reduction in passenger safety risk measured as fatalities and weighted injuries, normalised per million passenger kilometres, of 3%; and
- a reduction in workforce safety risk measured as fatalities and weighted injuries, normalised per million employee hours, of 3%.

11.17 Measurement of the delivery of the specification will be by reference to the Rail Safety and Standards Board's (RSSB) Safety Risk Model (SRM) which will be run at the beginning and end of CP4, and at one intermediate point. In addition, we have been working with the rail industry to establish a process for monitoring, on an annual basis, progress toward delivery of the specification.

11.18 The delivery of the reductions will require action by Network Rail and train operators. Network Rail has taken responsibility for co-ordinating the whole industry's plans (but not responsibility for ensuring delivery of TOC plans) and has presented them in its SBP

Make up of the safety specification

11.19 **Passenger risk:** measured in fatalities and weighted injuries (FWIs) train accident risk accounts for around 5% of the total risk to passengers (although in terms of fatalities alone train accidents account for around 25% of risk). Passenger risk at stations represents in the region of 70% of the total risk. The remaining roughly 25% of risk is accounted for by accidents to passengers on trains (excluding train accidents).

11.20 **Workforce risk:** risk to Network Rail employees and contractors accounts for around 50% of workforce safety risk; track workers being struck by trains or electrocuted, accounts for roughly 20% of this risk. Train operator workforce accounts for around 50% of total workforce safety risk on the network (this excludes risk to train operator employees in yards, sidings depots and other locations outside of stations and controlled infrastructure). The risk to train operator employees is split fairly evenly between risk to staff at stations and risk to staff on trains.

11.21 In consequence, delivery of the safety specification will depend largely on reductions in those injuries to passengers and workforces that, typically, arise from slips, trips, falls and manual handling.

Basis of analysis

11.22 Our analysis of the industry's proposals for delivery of the safety specification did not attempt to replicate its calculations. Rather we sought to test the industry's analysis by:

- assessing whether the underlying assumptions are sound;
- comparing the output against historic risk trends; and
- providing an informed view as to whether the proposals for safety improvement are credible and deliverable.

Soundness of underlying assumptions

11.23 In the development of the HLOS safety specification the industry, in conjunction with DfT, undertook modelling of future risk changes using a derivative of the SRM. In addition, Network Rail has said that, both in relation to its own calculations and in relation to the plans submitted by train operators, it has adopted a conservative approach to the extrapolations it has made. However, given the very significant changes in outputs during CP4 and the operational and engineering practices needed to deliver these we consider that there is some uncertainty around the extrapolation of current risk levels. This uncertainty arises from the possibility that changes in outputs and processes to deliver these will lead to unforeseen and unplanned for step-changes in safety risk.

Comparing the output of the industry's analysis against historic trends

11.24 Rail safety has been generally improving for many years. Train accident risk, as measured by RSSB's Precursor Indicator Model, has reduced by over 50% since 2002. Around 20% of this improvement has been achieved because of the implementation of TPWS, but now that the positive effect of TPWS has been fully reflected in the model the improving trend seen since the start of 2003 has flattened. In the recently released version 5.5 of the SRM risk to passengers has increased slightly in the 18 months since version 5 was published, but when the increase in passenger journeys over the same period is taken into account the normalised risk has actually decreased. Workforce risk as measured by the SRM has decreased by 6.5% since August 2006, with, in particular, a decrease in the number of track workers struck or crushed by trains. If improvements in rail safety seen over recent years continue to be delivered through CP4 the safety specification should be delivered.

Credibility and deliverability of proposals for risk reduction

- 11.25 Network Rail and train operators have proposed a wide range of measures to deliver the HLOS safety specification. Taken together, the industry predicts that the various initiatives it has put forward will reduce passenger risk by around 4% and workforce risk by around 7%.
- 11.26 Whilst the plans for the reduction in passenger risk appear to us to be broadly both credible and deliverable, there is, nevertheless, some uncertainty as to what actually will be delivered. The bulk of the plans put forward by Network Rail on behalf of the industry focus on train accident risk and, whilst this may be sensible in the context of paying attention to those risks with the greatest potential for fatalities, delivery of the safety specification is actually

dependent on improvements in risk to passengers at stations, largely in terms of major and minor injuries. Those plans that relate to passenger risk at stations, unlike many of the plans to address train accident risk, rely to a significant extent on managing passenger behaviour. In doing so, there is a higher degree of uncertainty as to the outcome compared to plans that involve technical fixes, such as improvements to the interior design of rolling stock. In addition, problems such as assaults at station and accidents arising from drunkenness at stations may be more influenced (positively or negatively) by what is happening within society as a whole than by what actions the railway takes.

- 11.27 Similarly, the proposals for reducing workforce risk rely heavily on softer plans such as enhanced leadership, better safety culture and increased use of CCTV, although harder plans are included such as reduction/elimination of signal post telephones following introduction of GSM-R, which means that drivers will not be required to leave their cabs to communicate with signallers. However, the SBP suite of documents appears to make little reference to workforce risk reductions arising from changes such as greater use of axle counters or improvements in infrastructure reliability that reduce the need for staff to work on or near the track. There is, therefore, a degree of uncertainty as to what actual results will be, although the predicted risk reduction includes a significantly higher margin for error.

Summary of our assessment of delivery of the safety specification

- 11.28 Set in a historical context a 3% reduction of the risk to passengers and workforce over CP4 appears feasible. However, given uncertainties around unforeseen step-changes in risk through CP4 and the actual impact of the industry's risk reduction plans, we consider that achievement of the safety specification represents a challenge for the industry. Nevertheless, we do not see any substantial reason why the specification will not be achieved. We consider it will be important to work closely with the industry during CP4 to monitor progress in delivery of the specification so that timely action can be taken should it look as if the specification will not be delivered.

Responses to our draft determinations

- 11.29 Few comments on safety issues were made by responders to our draft determinations. Among those who did comment there was general support for the HLOS safety specification and agreement with our view that the specification, whilst achievable, was challenging. Responders also noted that delivery of the specification would require good cross-industry activity.
- 11.30 Those few responders that raised concerns about safety matters, tended to focus on the possibility that the efficiency targets we have set might result in corner-cutting rather than genuine improvements in efficiency. More specifically, RMT expressed concerns about proposals to change possessions management. These are issues we have already identified and we are considering those initiatives and activities that we will want to follow up through our health and safety inspection plans for CP4.

- 11.31 In particular, we will carefully review Network Rail's CP4 delivery plan and, in light of the comments we have received, structure our inspection plans accordingly. We will focus our resources on those areas in the changing railway where we perceive the risks to workers and passengers are greatest. Our early thoughts are that track worker safety and effective asset management to ensure safety of the infrastructure, should be the central themes. We will consult stakeholders on our plans.
- 11.32 In its response GMPTE said that it was concerned that funding may not be available to enable improvements to stations so that additional passenger numbers can be accommodated, while meeting the 3% reduction in risk safety target within the HLOS. Network Rail, on behalf of the industry, identified in its SBP a number of actions at stations it considered necessary to deliver the 3% improvement in safety risk to passengers. Some of these actions involve enhancement activity, in some cases as part of significant station rebuilding. In these cases, we considered safety and agreed expenditure where it was necessary to address safety concerns. For smaller safety related enhancement activities we consider that the funding available to Network Rail should enable these to be carried out. In any case we will be working closely with the industry to monitor progress toward achievement of the HLOS safety specification so as to identify as early as possible any problems and any additional measures that need to be taken.

12. Overall efficient expenditure

Introduction

12.1 Building on our assessments in the previous chapters in this part of the document, this chapter summarises our assessment of efficiency and expenditure and our judgements on what we consider Network Rail needs in order to deliver its outputs in CP4.

Efficient expenditure

12.2 Table 12.1 summarises our judgement on the level of expenditure Network Rail should need to incur to deliver its required outputs, compared to the projections from its SBP/SBP update.

12.3 Tables 12.2 to 12.4 show our judgements for Network Rail's CP4 expenditure on an annual basis, for England & Wales, Scotland and Great Britain.

12.4 The basis for the calculations is:

- for controllable opex, we have taken the pre-efficient assumptions discussed in chapter 6 and applied the maintenance efficiency assumptions to them as discussed in chapter 7;
- the non-controllable opex assumptions are as described in chapter 6;
- for maintenance, we have taken the pre-efficient assumptions discussed in chapter 5 and applied the maintenance efficiency assumptions to them as discussed in chapter 7;
- for renewals we have taken our pre-efficient forecasts from chapter 5 and applied the renewals efficiency assumptions to them as discussed in chapter 7. We have not applied our efficiencies to the expenditure that we have accepted is post-efficient (as set out in chapter 8); and
- the enhancements expenditure assumptions are as described in chapter 9, with adjustments for costs identified as maintenance relating to NSIP and the HLOS performance fund.

12.5 Figures 12.1 to 12.3 show actual expenditure in CP3 (forecast for 2008-09) and our judgments for CP4.

Table 12.1: Summary of our CP4 efficient expenditure assumptions

| £m (2006-07 prices) | Controllable opex | Non-controllable opex | Maintenance | Renewals | Enhancements | Total |
|-------------------------------|-------------------|-----------------------|-------------|----------|--------------|--------|
| England & Wales | | | | | | |
| Network Rail's SBP/SBP update | 3,429 | 1,649 | 4,407 | 10,261 | 8,578 | 28,324 |
| Our determination | 3,059 | 1,635 | 4,539 | 9,473 | 7,222 | 25,928 |
| Scotland | | | | | | |
| Network Rail's SBP/SBP update | 347 | 148 | 483 | 1,397 | 448 | 2,823 |
| Our determination | 308 | 146 | 477 | 1,287 | 390 | 2,609 |
| Great Britain | | | | | | |
| Network Rail's SBP/SBP update | 3,776 | 1,796 | 4,887 | 11,658 | 9,026 | 31,143 |
| Our determination | 3,368 | 1,781 | 5,016 | 10,760 | 7,612 | 28,537 |

Table 12.2: Annual assumptions of CP4 expenditure – England & Wales

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total |
|-----------------------|--------------|--------------|--------------|--------------|--------------|---------------|
| Maintenance | 988 | 947 | 905 | 868 | 830 | 4,539 |
| Controllable opex | 656 | 638 | 612 | 588 | 564 | 3,059 |
| Non-controllable opex | 303 | 321 | 331 | 338 | 342 | 1,635 |
| Renewals | 2,383 | 2,060 | 1,812 | 1,651 | 1,567 | 9,473 |
| Enhancements | 1,370 | 1,857 | 1,399 | 1,381 | 1,215 | 7,222 |
| Total | 5,701 | 5,823 | 5,059 | 4,827 | 4,519 | 25,928 |

Table 12.3: Annual assumptions of CP4 expenditure – Scotland

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total |
|-----------------------|------------|------------|------------|------------|------------|--------------|
| Maintenance | 103 | 99 | 95 | 91 | 88 | 477 |
| Controllable opex | 66 | 64 | 62 | 59 | 57 | 308 |
| Non-controllable opex | 26 | 29 | 30 | 30 | 31 | 146 |
| Renewals | 309 | 297 | 262 | 228 | 191 | 1,287 |
| Enhancements | 165 | 121 | 89 | 8 | 7 | 390 |
| Total | 669 | 611 | 537 | 417 | 374 | 2,609 |

Table 12.4: Annual assumptions of CP4 expenditure – Great Britain

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total |
|-----------------------|--------------|--------------|--------------|--------------|--------------|---------------|
| Maintenance | 1,091 | 1,047 | 1,000 | 960 | 918 | 5,016 |
| Controllable opex | 723 | 702 | 674 | 647 | 621 | 3,368 |
| Non-controllable opex | 329 | 350 | 361 | 369 | 373 | 1,781 |
| Renewals | 2,693 | 2,356 | 2,074 | 1,879 | 1,758 | 10,760 |
| Enhancements | 1,535 | 1,978 | 1,488 | 1,390 | 1,222 | 7,612 |
| Total | 6,370 | 6,434 | 5,596 | 5,244 | 4,892 | 28,537 |

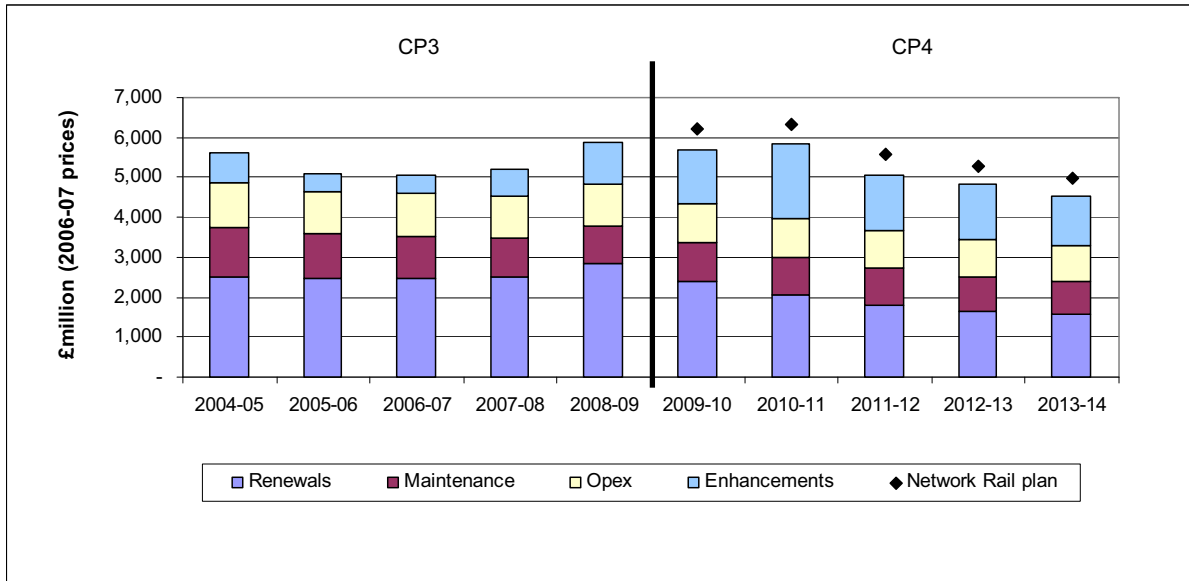


Figure 12.1: Actual expenditure in CP3 (forecast for 2008-09) and our CP4 assumptions – England & Wales

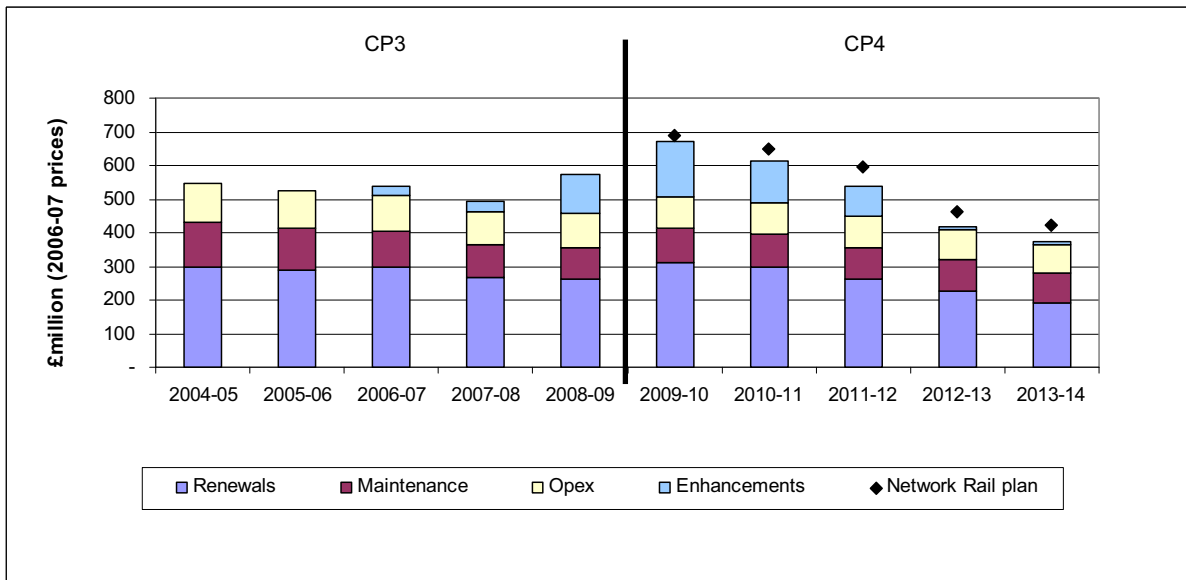


Figure 12.2: Actual expenditure in CP3 (forecast for 2008-09) and our CP4 assumptions – Scotland

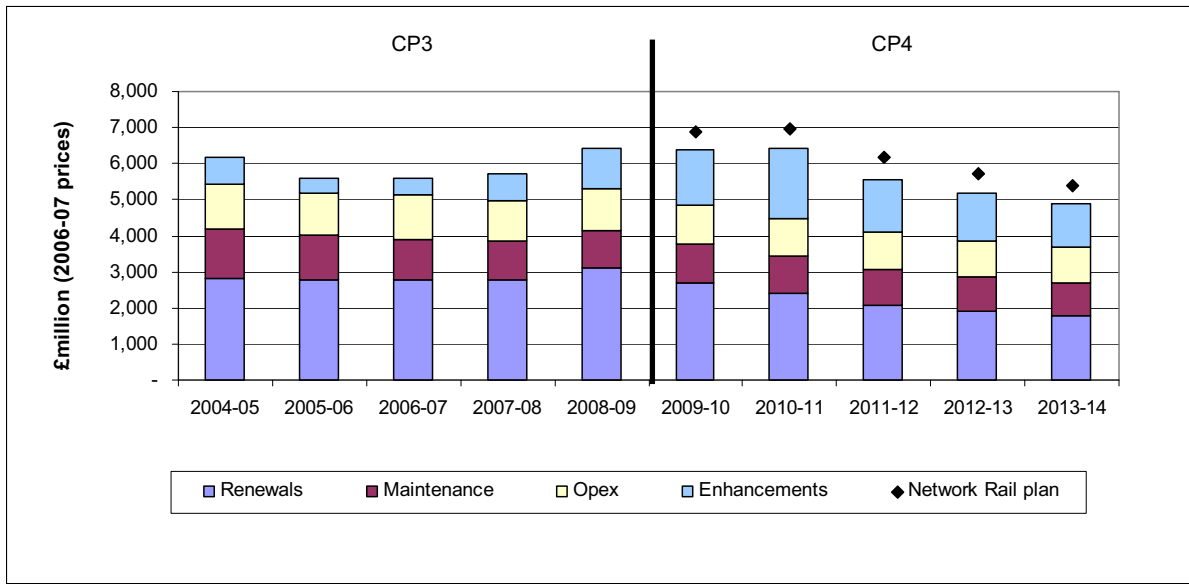


Figure 12.3: Actual expenditure in CP3 (forecast for 2008-09) and our CP4 assumptions – Great Britain

PART C: FINANCIAL FRAMEWORK AND THE REVENUE REQUIREMENT

13. Overview of the financial framework and revenue requirement

Introduction

- 13.1 This part of the document sets out our determination on the financial framework, including the allowed rate of return and how this is to be split into different components, rules governing the ring-fenced fund, the re-opener provisions, the calculation of the opening RAB and rolling forward the RAB in CP4 and the methodology for logging up capex overspend. We then set out our determination for Network Rail's gross revenue requirement in CP4, based on our expenditure assessment and financial framework. It also sets out our determination on the values/levels for all the elements of the financial framework.

Background

- 13.2 As part of PR08, we have undertaken a thorough review of the financial framework for Network Rail and the incentives that this creates. Our aim has been to establish a framework that strengthens the incentives facing Network Rail at the corporate level, and complements the incentives operating at the management level, within the existing industry structure. We have therefore supported Network Rail's intention to raise debt without the support of the government guarantee because we expect that this will introduce a hard budget constraint and greater scrutiny by lenders of Network Rail's operational and financial performance.
- 13.3 In addition, we have assessed each of the three main elements of the financial framework:
- the allowed return;
 - the definition and treatment of the regulatory asset base (RAB), including amortisation; and
 - the way in which risks and uncertainties are treated.
- 13.4 In our update on the framework for setting outputs and access charges in February 2008 and our draft determinations, we set out our proposed decisions on the financial framework for Network Rail in CP4. This included the methodology for disaggregating the framework for England & Wales and Scotland, the approach to be used in establishing Network Rail's allowed return, the principles underlying the financial modelling assumptions in determining Network Rail's revenue requirement, our treatment of pensions and corporation tax, our approach to rolling forward the RAB during CP4 and the balance between network grants and track access charges for CP4. We also consulted on the outstanding issues, in particular, the rules governing the ring-fenced fund and the interaction with the re-opener provisions.

- 13.5 In developing our determination, we have taken into account the views of stakeholders. In particular, we have worked closely with Network Rail, DfT and Transport Scotland in an attempt to establish a financial framework that meets our objectives whilst also considering the requirements of others.

14. The high-level financial framework and the allowed return

Introduction

14.1 This chapter sets out our determination on the high-level financial framework, including Network Rail's allowed return, for CP4. Our draft determinations stated that we would continue to keep financial markets under review and consider the implications of market conditions for our final determination. In light of the continuing dislocation in the financial markets, and on the basis of a number of persuasive arguments put forward by Network Rail, we are making some changes to our draft determinations.

Outline of the financial framework

14.2 Network Rail's parent company is a company limited by guarantee (CLG) and Network Rail benefits from a government guarantee of its debt through the financial indemnity mechanism (FIM). In our July 2006 consultation document on incentives, we stated that the company's current financial structure materially weakens the role of financial incentives facing Network Rail at the corporate level.⁷⁸ We therefore proposed to establish a financial framework for Network Rail that strengthens these financial incentives.

14.3 In our February 2007 advice to ministers and our February 2008 PR08 update, we set out our proposed decisions on the high-level financial framework for Network Rail in CP4. In particular we said that:

- Network Rail will be provided with an allowed return that reflects its risk adjusted cost of capital;
- we continue to support Network Rail's intention that the use of the FIM will be restricted from the start of CP4, requiring Network Rail to issue debt without the government guarantee;
- Network Rail will be required to pay to DfT, as provider of the FIM, a fee that reflects the long-run value of the credit quality enhancement received as a result of the guarantee. It was proposed that this fee be payable annually on the expected nominal value of outstanding FIM-backed debt on 1 April 2009;
- part of the allowed return will be required to meet Network Rail's financing costs (including the FIM fee). The remainder will be split between:

⁷⁸ *Enhancing Incentives for Continuous Improvements in Performance*, Office of Rail Regulation, July 2006. This may be accessed at www.rail-reg.gov.uk/upload/pdf/298.pdf. The document provides greater analysis of the impact of the current financial structure on incentives.

- a risk buffer, to enable Network Rail to manage business risk and normal fluctuations in cash flow. To the extent that Network Rail does not use this risk buffer to meet fluctuations in cash flow, it will have discretion over its use; and
- a ring-fenced investment fund (RFF), which will be earmarked to fund HLOS outputs except in instances where profits fall short of expected levels and Network Rail decides that it needs to defer capex in order to finance its business.

14.4 Figure 14.1 illustrates this approach.

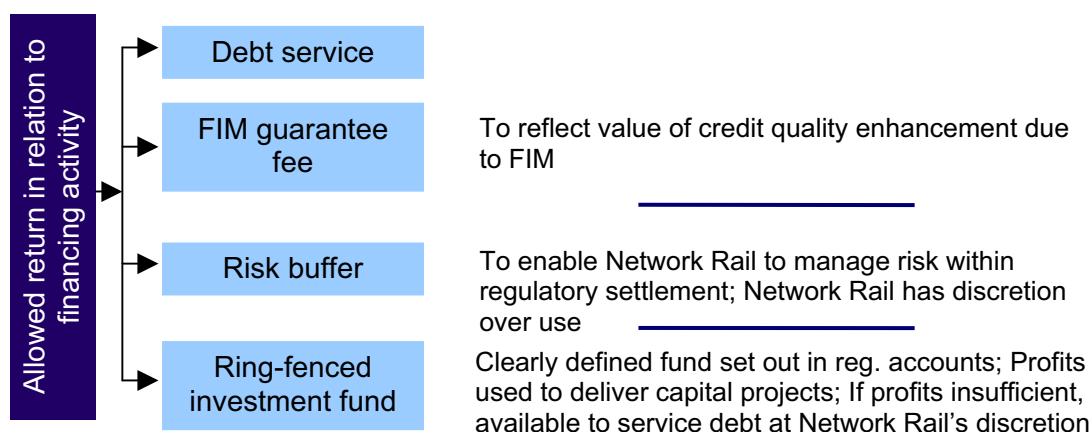


Figure 14.1: Allocation of the allowed return

- 14.5 Raising unsupported debt represents a key milestone in Network Rail's progress towards financial independence. It is also a way of improving the incentives facing the company. This is because it is expected to introduce both a hard budget constraint on Network Rail and greater external scrutiny of its performance.
- 14.6 The hard budget constraint is achieved by imposing a limit on the extent that Network Rail is able to raise additional debt. The 'hardness' of the limit will depend on both our determination for CP4 and Network Rail's performance. For instance, significant overspends on operating expenditure could be expected to reduce materially Network Rail's ability to raise additional debt, whilst outperformance – either operationally or financially – of the regulatory assumptions could be expected to increase its capacity to raise debt.
- 14.7 The greater external scrutiny should result from lenders to Network Rail having money that is at risk. Consequently, lenders – especially bank lenders – can be expected to monitor Network Rail's performance, both financial and operational; something that does not currently happen. Our discussions with lenders suggest that signs of a deterioration in Network Rail's financial position or an identification of systematic problems would result in them asking probing questions of the company, increasing their monitoring, and

insisting on more onerous arrangements for providing finance (both in terms of information provision and cost).

- 14.8 The fact that Network Rail will need to access the credit markets on a regular basis and for significant amounts of debt, heightens the incentives on the company. In order to do this efficiently, our expectation is that it will need to maintain a solid investment grade credit rating. A downgrade or a move to a negative outlook could seriously hamper the company's ability to raise debt efficiently. This should add strong incentives on the company to operate in line with our determination.
- 14.9 The new financial framework should offer value for money. This is because even the modest rise in the level of efficiency that we might expect Network Rail to achieve as a result of the discipline arising from the new financial framework is expected to result in savings greater than the additional costs of unsupported debt.⁷⁹
- 14.10 This is because the new arrangements should result in real risk transfer from taxpayers to investors. Government has made it clear that unsupported lenders should not assume that it will step in if Network Rail gets into financial difficulties. This is integral to the incentives in the new financial framework because it should mean that investors provide appropriate levels of monitoring and scrutiny of Network Rail's performance. We will update our value for money assessment before making the final decision on the network licence change required to implement the new arrangements (see below).
- 14.11 The stronger incentives resulting from the new financial framework will complement both the existing, and the new, financial and reputational incentives on Network Rail's management. They are not intended to replace them. Indeed, our monitoring of Network Rail's performance and the management incentive plan remain core components of the package of incentives facing Network Rail.
- 14.12 We have said to Network Rail that we expect there to be a direct link between the new financial framework and the management incentive plan (MIP). Network Rail has confirmed that there will be a direct link. We propose to require its remuneration committee to publish a letter stating how it has arrived at its decisions on management bonuses and, in particular, how it has taken into consideration factors at the remuneration committee's discretion (e.g. the performance of unsupported debt) and any relevant issues highlighted by us. We will also require the company to provide current and

⁷⁹ We commissioned NERA to undertake a study to estimate the extent to which we could expect Network Rail to achieve greater efficiency gains as a result of the envisaged changes to the financial framework. The analysis suggests that there is a link between a regulated company's financial structure and the speed at which it achieves improvements in cost efficiency. In particular, they suggest that the existence of a significant tranche of unsupported debt should increase the rate at which efficiencies are achieved by around 0.5% per annum for a least the duration of one control period. NERA's report may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/pr08-isbp-nera.pdf>.

forward looking key financial information, including financial ratios, on a regular basis.

Allowed return

- 14.13 We will provide Network Rail with an allowed return for CP4 that reflects its risk-adjusted cost of capital. Doing so should 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. It should also enable the company to maintain financial ratios sufficient for it to raise debt unsupported by government at a reasonable price.
- 14.14 In determining the cost of debt within the overall allowed return, 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. Consultants CEPA have been advising us on the appropriate cost of capital for Network Rail.
- 14.15 Our September 2007 financial issues update and further consultation letter⁸⁰ said that CEPA's initial study, conducted in June 2007, suggested a range for the cost of capital of 4.1% - 4.7%, (real vanilla).⁸¹ Importantly, the bottom part of this range depended on indexing a part of the allowed return to a pre-determined benchmark. In the absence of indexation, CEPA's initial range tightened to 4.3% - 4.7%.
- 14.16 We asked CEPA to update its report in April 2008 to reflect market conditions at that time. Its updated study provided a range of 4.5% - 4.9% for Network Rail's cost of capital, with 4.7% - 4.9% being its preferred range.⁸² The increase in its figures reflects, in particular, the greater volatility and uncertainty exhibited by financial markets. The range takes account of the low cost of embedded debt that would be faced by an efficiently financed Network Rail at the outset of CP4.⁸³
- 14.17 In addition, we commissioned a study from First Economics⁸⁴ on the underlying risk that Network Rail faces compared to other UK regulated network industries. This, in our view, provides strong evidence that Network Rail's risk profile is below that of the airports and is similar to the energy and

⁸⁰ This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/pr08-financial-issues-let-060907.pdf>.

⁸¹ This is the allowed cash return on the RAB. A 'vanilla' return is based on a pre-tax cost of debt and a post-tax cost of equity.

⁸² *Risk Adjusted Cost of Capital for Network Rail: Update*, CEPA, April 2008. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/pr08-cepacoc-010408.pdf>.

⁸³ Embedded debt is debt which is projected to be on Network Rail's balance sheet at 31 March 2009 and which has a fixed rather than a variable interest rate.

⁸⁴ *The Riskiness of Network Rail Relative to Other Regulated Industries: A report prepared for the Office of Rail Regulation*, First Economics, June 2008. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/pr08-fecon-010608.pdf>.

water sectors. We are providing Network Rail with some very significant protections against risk, particularly related to its capital investment programme. It also faces very little volatility in revenues. The majority of its income is fixed for the five year control period.

14.18 On the basis of the available evidence at the time, our draft determinations set the allowed return at 4.7% on a real vanilla basis. This figure was based on the assumption that there was no material change in credit market conditions for a borrower like Network Rail. We said that we would monitor the developments in the financial markets and, if necessary, reassess the allowed return ahead of our final determination.

14.19 Network Rail has argued that the cost of capital for Network Rail based on a notional capital structure would be higher than the 4.7% included in our draft determinations and it provided some confidential analysis to support its view. By focusing on what it believes will be required to finance its business, Network Rail said that it requires a WACC, on average, of 4.8%, which it says is materially lower than a conventionally financed company would require.

Further analysis following our draft determinations

14.20 Network Rail provided to us a confidential submission in response to our draft determinations. This contained a report from one of its advisors updating its view on an appropriate range for the cost of capital for a notional Network Rail. This continued to be above CEPA's range for the cost of capital. Network Rail also provided a detailed breakdown of the likely cost of debt it was projecting to face in CP4.

14.21 We asked CEPA to conduct a further update of the cost of debt based on current market conditions and advise on any implications for the cost of capital, and taking into account Network Rail's submission following our draft determinations. CEPA was provided with a copy of Network Rail's confidential submission on financial issues in response to our draft determinations. We and CEPA also spoke with Network Rail and its advisors on a number of occasions.

14.22 CEPA's analysis found that:

- there is limited evidence to suggest that the cost of conventional A- rated corporate debt, as observed in the secondary market, has increased since April 2008; but
- the cost of raising unsupported debt at the beginning of CP4 is likely to be materially higher than the yields observed in the secondary market, reflecting the fact that in current market conditions there is a significant 'new issue' premium being charged to all borrowers and that Network Rail, as a new unsupported debt issuer, is likely to face an additional 'new issuer' premium.

- 14.23 On the basis of this analysis, CEPA conclude that it is reasonable to assume a real cost of unsupported debt at the beginning of CP4 of about 4%. This compares with a range of 3% to 3.75% in its April 2008 report.
- 14.24 CEPA also advise that there are grounds for expecting a reduction in the real cost of unsupported debt over CP4. These are as follows:
- a reduction in the new issue premium as credit market conditions improve;
 - greater familiarity with Network Rail's business risks and credit quality; and
 - there may be increased appetite for debt issued by regulated utilities as lenders seek out lower risk corporate opportunities.
- 14.25 Having conducted this analysis, CEPA then goes on to say that its estimate of the weighted average cost of debt, which includes the low embedded cost of debt for a notional Network Rail, would still be within the 3.25% to 3.5% range it presented in April 2008. This is because the April 2008 analysis was based on Network Rail's proposed capital programme and assumed new borrowing requirements whereas its recent analysis was based on the lower capital expenditure and associated lower new borrowing requirements as implied by our draft determinations.

Regulatory precedent

- 14.26 We have also reviewed the allowed return for Network Rail in light of regulatory precedent. While we consider that it is important for our approach to be consistent with that of other UK regulators, we also believe that it needs to reflect Network Rail's particular characteristics.
- 14.27 In considering the cost of debt in particular we have explicitly taken into account the ability of the company to have taken advantage of earlier advantageous credit market conditions. This has enabled us to adopt a lower allowed return than would otherwise be the case. However, the allowed return is well within the 4.0% to 5.5% range proposed for BAA (Heathrow) by the Competition Commission in its October 2007 report on the economic regulation of the London airports.⁸⁵ It is also similar to Ofgem's gas distribution price control review at 4.9%.

Our determination on the allowed return

- 14.28 CEPA does not change its range for the cost of capital based on its updated analysis. Nevertheless, in light of the evidence presented by CEPA on the cost of new debt, and taking account of confidential representations made by Network Rail, we have concluded that we should increase slightly the allowed rate of return from the 4.7% per annum included in our draft determinations to 4.75% per annum. We continue to disagree with Network Rail that a notional

⁸⁵ The Competition Commission's final report is available at www.competition-commission.org.uk/rep_pub/reports/2007/fulltext/532.pdf.

Network Rail would require a rate of return above this level for reasons set out above.

- 14.29 If the cost of debt that an efficient Network Rail faces moves materially higher, this could clearly be grounds for triggering a reopener of the price control and a possible change to Network Rail's revenues and/or outputs.

Disaggregating the allowed return for England & Wales and Scotland

- 14.30 In line with our policy for providing separate determinations for England & Wales and for Scotland, we have considered whether there is a rationale for the allowed return to be different between the two geographic areas based on the risk profile in each area. This does not affect the way in which we expect Network Rail to finance itself, i.e. as a single GB-wide business entity.
- 14.31 Based on our understanding of the relative risk profiles of Network Rail's activities in each region, we do not believe that there is a strong case for differentiating the allowed return between England & Wales and Scotland.

Components of the allowed return

- 14.32 Providing Network Rail with a risk adjusted cost of capital should enable the company to secure a solid investment grade credit rating which should in turn enable it to raise the necessary amount of unsupported debt at a reasonable cost. It should also leave the company with a substantial surplus after covering its financing costs. This is largely because of the absence of shareholders and hence no requirement on Network Rail to pay dividends. A key advantage of Network Rail's CLG structure is that any surpluses realised by the company remain in the industry. However, it is crucial that these surpluses are used efficiently and benefit funders and customers. The allowed return over and above Network Rail's financing costs will therefore be split into two components after payment of a FIM fee to DfT, namely a risk buffer and a ring-fenced fund used to reinvest in the rail network.

Debt and Interests costs

- 14.33 We discussed the basis of our debt assumption in our September 2007 financial issues letter. All respondents favoured using actual debt. Due to the importance of Network Rail facing a hard budget constraint in CP4 and the fact that our forecast level of actual debt at 1 April 2009 is generally in line with the gearing of an efficiently financed company with similar risk characteristics as Network Rail, we have decided to use the forecast level of actual debt at 1 April 2009 as the starting point when:
- forecasting interest costs for the purpose of sizing the ring-fenced investment fund in CP4;
 - calculating the interest cost assumption used in the calculation of the corporation tax allowance;
 - forecasting corporation tax payments; and

- considering financeability issues.

- 14.34 The movements in debt during CP4 are consistent with our income, expenditure and interest cost assumptions.
- 14.35 In CP5, for the purpose of sizing the ring-fenced investment fund, calculating the interest cost assumption used in the calculation of the corporation tax allowance, forecasting corporation tax payments and considering financeability issues, we intend to roll forward the debt assumption used in CP4 for efficient movements in debt.
- 14.36 We have increased our interest cost assumptions from those in our draft determinations. Based on CEPA's analysis, the assumptions we made at draft determinations now look optimistic, particularly for new unsupported debt and new supported index-linked debt. We have increased our assumptions in line with CEPA's recommendations. All other things equal, this reduces the size of the ring-fenced fund.

The FIM fee

- 14.37 The fee payable to DfT for the provision of the FIM will be set at 80 basis points (that is, 0.8%) on the outstanding FIM-backed debt. We believe that this fee level broadly reflects the long-run value of the credit enhancement that Network Rail benefits from as a result of the FIM.
- 14.38 Our draft determinations said that the fee would be fixed for CP4 based on the nominal level of FIM-backed debt outstanding on 1 April 2009. This reflected the draft determination assumption that there would be no new FIM-backed debt in CP4 (except refinanced debt). Under this proposal, DfT would have certainty about the level of fee it would be receiving in CP4.
- 14.39 Two changes since the draft determinations affect the FIM fee calculation:
- Network Rail will continue to raise some additional FIM-backed debt in CP4; and
 - DfT has now written to us saying that it would prefer the FIM fee to vary with the level of FIM debt outstanding.
- 14.40 A variable FIM fee is actually more appropriate and will provide Network Rail with a more immediate benefit (and hence stronger incentive) if it is able to reduce the amount of FIM debt as a result of outperforming the determination. We can therefore confirm that Network Rail will pay an annual FIM fee based on the actual amount of outstanding FIM-backed debt.

The risk buffer

- 14.41 The risk buffer will be set at an annual average of £208m (in real terms). Based on Oxera's analysis for us and an assessment of Network Rail's capacity to raise finance, we believe this is sufficient to enable the company to

manage business risk and normal fluctuations in cash flow effectively.⁸⁶ The risk buffer will be split into £185m for England & Wales and £23m for Scotland (both in real terms). However, if required, Network Rail is expected to utilise the risk buffer on a GB-wide basis. If Network Rail does not use its risk buffer to accommodate fluctuations in cash flow, the company will have full discretion over its use.

- 14.42 Network Rail has argued for a higher risk buffer of £250m per annum but has provided no analysis to support its case, except to say that it is possible to construct scenarios in which the risk buffer we have assumed would be fully utilised. Whilst this is undoubtedly true, it will clearly also be possible to construct scenarios in which Network Rail's proposed risk buffer would be fully utilised.
- 14.43 We continue to believe that a risk buffer of £208m per annum will provide appropriate protection for Network Rail to manage business risks and normal fluctuations in cash flow, particularly given the very considerable protections we are providing for the company within this determination. Although we have increased the protections against risk since the draft determinations, we are taking a cautious approach by not reducing the risk buffer to take account of those further protections.

The ring fenced fund

- 14.44 As set out above, the value of the RFF is the residual from the allowed return once expected debt service costs, the FIM fee and risk buffer have been deducted. In real terms, the RFF will therefore average £492 m per annum for GB as a whole. This is equivalent to 33% of enhancement expenditure and 14% of total capital expenditure during CP4. The RFF will be split into £440 m per annum on average for England & Wales and £52 m per annum for Scotland.
- 14.45 The RFF is higher than set out in our draft determinations because, following discussions with Network Rail and DfT, it is now calculated by deducting cash interest costs from the allowed return rather than interest costs which would be posted to the profit and loss account. The former will be lower because interest excluding the inflation element is actually paid on index linked debt (which then increases in size over time with inflation) whereas the full amount of interest, including the inflation element, must be booked to the profit and loss account.
- 14.46 If capital expenditure up to the value of the RFF is deferred, the expenditure to be deferred will, in the first instance, reflect the geographic areas where the variation in profit has occurred. However, Network Rail will retain the right to defer all RFF expenditure if necessary regardless of the area where the variation in profit has occurred.

⁸⁶ *What is the necessary margin for Network Rail to accommodate risk?* Oxera, October 2006. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/pr08-isbp-oxera.pdf>.

Implementing the restriction of use of the FIM

- 14.47 We support Network Rail's intention that the use of the FIM will be restricted from the start of CP4. Since our draft determinations, and based on the continuing dislocation in the financial markets, Network Rail has proposed a more gradualist approach to raising unsupported debt. Under such an approach, the issuance of unsupported debt would start slowly and progressively increase over CP4. By the final year of CP4, 80% of incremental debt would be raised without the FIM. Network Rail says that such an approach would have material benefits in terms of cost, value for money and risk mitigation.
- 14.48 We believe that a gradualist approach is a sensible option in current market conditions. Provided that the amount of unsupported debt raised in year one remains significant and there is a firm requirement for Network Rail to increase the proportion of unsupported debt issued throughout CP4, we believe that the incentive properties associated with unsupported debt should largely remain.
- 14.49 We will need to introduce a modification to Network Rail's licence to implement these arrangements. The licence condition that we introduce will therefore need to determine the extent to which Network Rail's CP4 financing requirement is met by supported versus unsupported debt. The drafting of the licence modification will be driven by the necessity of maintaining a hard budget constraint and the importance that we attach to the injection of at-risk capital.
- 14.50 We understand that DfT also supports restricting use of the FIM, subject to ensuring that mechanisms are in place to ensure that the unsupported debt really does transmit the desired incentives to Network Rail. We clearly share this view and we will be working with Network Rail and DfT over the next few months with the aim of ensuring that this is achieved.

Rules governing the ring-fenced investment fund

- 14.51 As set out above, a part of Network Rail's allowed return will be earmarked for a ring-fenced investment fund (RFF). The RFF will be a virtual fund, specified for England & Wales and for Scotland separately. It will be 'virtual' in the sense that it will be identified explicitly in Network Rail's regulatory accounts but will otherwise simply be another part of the company's income.⁸⁷
- 14.52 The RFF will be used to fund a proportion of the capex that is required to deliver the HLOSs on a pay-as-you-go basis. The RFF expenditure will not therefore be added to the RAB.

⁸⁷ Creating an actual fund for the RFF that sets aside cash that Network Rail then draws down to deliver specified projects would, in our view, unnecessarily constrain the company's ability to manage its business efficiently.

- 14.53 Following concerns expressed by Network Rail and feedback from one of the rating agencies, we propose a change to the way the RFF will work. For the draft determinations, we assumed that income earmarked for RFF expenditure in any one year would be used to fund HLOS outputs in that same year. In order to ensure that the RFF will be treated by rating agencies/investors as cashflow available for debt service and as revenue in the company's accounts, we now believe that it would be more appropriate to structure it as profit in any given year which would then be reinvested in future years on HLOS outputs at Network Rail's discretion. If Network Rail exhausts its risk buffer in any one year, leading to profits falling short of expected levels and a deterioration in financial ratios, HLOS outputs could be deferred if Network Rail decided this was necessary for it to continue to finance its business within the determination allowances.
- 14.54 It is likely that Network Rail will only confirm its profitability and financial position, and therefore be able to decide whether it needs to defer outputs and which outputs to defer (in consultation with funders) after year end, and so in practice the lag between the receipt of revenues and spend on part of the HLOS outputs will be two years. Network Rail has confirmed that it will use profits generated in the last two years of CP3 to reinvest in the first two years of CP4. There should therefore be no adverse impact on the delivery of the HLOS outputs in the first two years of CP4 resulting from these revised arrangements.
- 14.55 The remainder of this section sets out the rules for the operation of the RFF taking account of the feedback from stakeholders on the draft determinations, feedback from one of the rating agencies, and responses to our consultation on the procedural approach to conducting an interim review. These detailed arrangements are consistent with the principles discussed with Network Rail, government and rating agencies early in the process. In particular, it was agreed at the outset that:
- the ring-fenced fund represents the equivalent of reinvestment of a base level of dividends; and
 - money in the funds will be available for debt service during underperformance.

Requirements on Network Rail to deliver ring-fenced fund projects

- 14.56 Our determination of Network Rail's allowed revenues for CP4 is based on our judgements on the expenditure necessary to deliver all the required outputs efficiently. However, Network Rail will have full discretion to defer delivery of capex up to the value of the RFF subject only to the requirements of a notification process as discussed below.
- 14.57 Should Network Rail's profits be significantly lower than those assumed in our regulatory determination in any year (for example as a result of cost overruns) the company will be able to defer its capex spend in following years. It will be up to the company to decide whether it needs to do this in order to continue to

finance its business. The company will not therefore be required to deliver the full HLOS outputs in these circumstances.

Defining the outputs contained in the ring-fenced fund

14.58 The notification process will allow DfT and Transport Scotland a defined period within which they may specify the outputs that should be deferred in the event that Network Rail does not make sufficient profits to reinvest. If this information is not provided within an allotted time, Network Rail is able to choose the outputs that will be deferred up to the value of the RFF. Network Rail will therefore need to retain sufficient flexibility in its capex programme to enable efficient deferral of spend up to the value of the RFF.

Dealing with fluctuations in Network Rail cashflow

14.59 Our determination of Network Rail's allowed revenues for CP4 is based on our judgements on the expenditure necessary to deliver the required outputs efficiently. In our view, the revenues should be sufficient to enable the company to achieve a solid investment grade credit rating, on the basis that the company operates efficiently. The determination should also provide the company with the capacity to absorb some fluctuation in cash flow. If Network Rail meets or exceeds the regulatory assumptions in CP4, all specified outputs should be delivered, including those funded through the RFF.

14.60 Should Network Rail start to overspend versus the determination or face other changes in circumstances which impact on its revenues it will have finite capacity to raise additional debt. The extent of this capacity, determined by the financial markets, reflects both our determinations and the reason for any overspend. This finite borrowing capacity is very different to the position that exists in CP3, where, due to the government guarantee, borrowing capacity to fund overspends is subject only to the licence condition which prohibits Network Rail's financial indebtedness exceeding 90% of the value of the RAB.

14.61 From the start of CP4, we will introduce an explicit logging up mechanism for efficiently incurred capex (i.e. renewals and enhancements) overspend (see chapter 15). Consequently, where Network Rail has overspent efficiently on capex, the company will receive early assurance that it will be remunerated for this in the next control period (subject to the rules of the roll forward of the RAB as set out in chapter 15). This mechanism should support Network Rail's ability to borrow within the control period.

14.62 Should Network Rail's overspend or other changes in circumstances be sufficiently large, taking account of the logging up arrangements described above, the determinations may need to be re-opened (see below).

14.63 If the determination is not re-opened and there is no interim review, Network Rail will need to manage within its original CP4 settlement, deferring HLOS outputs up to the value of the RFF if necessary.

RFF notification process

14.64 If in any year Network Rail decides that it needs to defer capex up to the value of the RFF, Network Rail will need to:

- notify us that this is the case; and
- set out to us and discuss with us its future plans, including an indication of when deferred outputs are likely to be re-instated.

14.65 Government will then be given a pre-defined time period to specify exactly which outputs it would want to be deferred.

14.66 If Government does not do this within the time provided, Network Rail will have full discretion as to which outputs to defer.

14.67 Network Rail will need to revise its delivery plan to reflect the deferral of outputs.

Split between England & Wales and Scotland

14.68 Should Network Rail need to defer outputs up to the value of the RFF, the split between England & Wales spend deferred and Scotland spend deferred would reflect the sources of variance in profit compared to our determinations in each geographic area. Should the variance be attributable entirely to one geographical area, say England & Wales, then only England & Wales outputs could be deferred in the first instance. However, if the variance were sufficiently large, outputs across the whole network (including Scotland) could be deferred.

14.69 Should overspend be related entirely to one geographical area and be sufficiently large to require outputs in both areas to be deferred, the funder for the other geographical area would have the option of providing additional grant funding to Network Rail specifically to ensure that all its outputs are delivered on time.

14.70 However, this is subject to the additional funding being ring-fenced so that it can be used by Network Rail only to deliver restored outputs to the value of the RFF in the geographical area where the overspend has not occurred. In particular, the additional funding should not be available to service debt under any circumstances.

Consequences for Network Rail of deferral of outputs funded by the RFF

14.71 Network Rail will clearly wish to avoid being in a position where it has to defer HLOS outputs. But it will have the option to do so if it is unable to fund the investments.

14.72 An important element of the new financial framework that we are establishing for Network Rail is that this new framework should be reflected in Network Rail's management incentive plan. We have had confirmation from Network Rail's remuneration committee that, in setting bonuses, it will explicitly take

into consideration the company's financial performance, including the level of the RFF that has been generated and changes in credit rating.

- 14.73 We confirm our draft determinations that the FIM fee payable by Network Rail to DfT should not increase in the event that Network Rail defers outputs funded by the RFF. If the FIM fee were to increase, it may exacerbate an already difficult situation.

Triggering a re-opener

- 14.74 Our determination will provide Network Rail with a revenue stream that, in our view, is sufficient for it to deliver all its regulatory outputs provided that it operates efficiently. In addition, the regulatory framework provides a number of protections to Network Rail in the event of unforeseen circumstances (e.g. the capex logging up mechanism, explained further below). It is not the intention, however, that the allowed revenues are sufficient to absorb significant external cost shocks or other material changes in circumstances. In such circumstances, the determination may need to be re-opened, resulting in an interim review.

- 14.75 Our determination on re-openers is:

- we will retain the existing material change in circumstance re-opener provision. This will continue to provide important protection for the company and its lenders so that it is able to manage such changes in circumstances;
- that Network Rail should be able to request a re-opener at the point at which it is unable, or expects to be unable, within the next 18 months, to finance itself efficiently in the absence of additional funding or a reduction in outputs (including a deferral of outputs up to the value of the RFF). In the interests of simplicity, rather than define the point at which this occurs explicitly, the onus should be on Network Rail to notify us if it considers that this is likely to occur, based on robust projections. Although the onus will be on Network Rail to request a re-opener under this provision, our regular monitoring of the company should provide early warning of impending difficulties.
- following further discussions with stakeholders as well as lenders and rating agencies, we will also include a quantified threshold at which Network Rail can ask for an interim review, to remove the uncertainty as to the point at which a re-opener could be triggered. This will take the form of a threshold cash flow ratio (the adjusted interest cover ratio (AICR)).

The AICR threshold level will be around 1.4x for the forward three-year average based on Network Rail's independently verified projections. Where CP5 ratios are included in this ratio, the company is expected to assume that all key financial ratios are compatible with a solid investment grade credit rating. This is consistent with the approach that we understand credit rating agencies take in assessing credit worthiness.

Network Rail will be calculating its current and forward-looking (at least to the end of CP4) key financial ratios anyway. The approach should not, therefore, create an additional regulatory burden.

We believe that the addition of this quantified threshold re-opener provision should provide government, the company and its lenders with assurance that any significant external shocks or other changes in circumstances will be addressed in an appropriate and timely manner. Clearly the company would still have a strong incentive to maintain strong financial ratios; and

- we will also provide a separate Scotland re-opener threshold. This trigger is defined in terms of a percentage deviation in Scottish spend versus the Scotland component of the determination. We have determined that the threshold level for the Scotland-specific re-opener provision will be a 15% overspend versus the regulatory determination in Network Rail's projected forward three-year average total net expenditure in Scotland (as defined in the regulatory accounts). Triggering a re-opener under this provision would lead to a possible interim review in Scotland only (i.e. only Scotrail's track access contract and any successor contract will include this provision). There would be no re-opening of the England & Wales determination unless one of the other re-opener provisions was also triggered. Due to the relative size of England & Wales to the overall determination, we do not think that there needs to be a separate re-opener provision for England & Wales.

14.76 In each case we would need to determine whether the terms of the relevant re-opener had been met and, if so, would then consider whether there is a compelling case for the interim review in light of our section 4 duties.

14.77 We have tested the appropriateness of this approach with credit rating agencies and lenders, and taken account of the views of consultees.

Triggering a re-opener

14.78 There will be a two stage process to triggering the re-opener:

- Stage 1: Should Network Rail believe that it is, or is likely to be, unable to deliver all its regulatory outputs (including any outputs that have been deferred through the RFF process) in the absence of an adjustment to outputs and/or revenues because it believes it has satisfied the conditions of one or more of the re-opener provisions set out above, then it will be able to request an interim review.

At the same time, the company will need to set out to us:

- the re-opener provision(s) that it is requesting the interim review under;
- a detailed explanation of the reasons it believes it has satisfied the terms of the re-opener, including evidence on the extent to which its efficient costs and revenues have been impacted; and

- the actions (if any) it has taken to mitigate the change in efficient costs and revenues.
- Stage 2: We will then undertake a rapid assessment of whether the terms of the re-opener(s) concerned have been met. Depending on the re-opener(s) concerned, this will involve an assessment of:
 - whether there has been a material change in circumstances;
 - the robustness of Network Rail's AICR projections; and/or
 - the robustness of Network Rail's net expenditure projections for Scotland.

We will also consider whether there is a compelling case for an interim review in each case against our section 4 duties.

We will complete this assessment in no more than two calendar months of receiving Network Rail's formal submission. We will need to consider what consultation is required with interested persons such as the affected funders. In view of the short timescales, any consultees could only have relatively short timescales in which to set out their view and our process should therefore contemplate the possibility of hearing(s).

Where we are satisfied that the terms have been met, our determination will be re-opened, leading to an interim review (see below). Importantly, if the issue is confined to a single geographic region (i.e. to England & Wales only or to Scotland only), then we will ensure that the outcome of the review impacts only on the appropriate train operators and funders.

- 14.79 Where we are not satisfied, there will be no interim review. Network Rail will need to deliver the existing regulatory outputs within its existing level of funding (determined in PR08), deferring outputs up to the value of the RFF if it deems it necessary.
- 14.80 Should Network Rail's financial position deteriorate materially further, it would have the right to request a re-opener under one or more of the provisions again.
- 14.81 It is important to note that our regular monitoring of Network Rail should provide early warning of impending difficulties. For instance, we already monitor Network Rail's expenditure on a quarterly basis. We also assess Network Rail's performance against the regulatory efficiency assumptions on an annual basis. The efficiency analysis included in our annual assessment currently provides our assessment of Network Rail's performance for OM&R, but will be expanded to cover enhancement expenditure under the logging up mechanism.

Undertaking an interim review

- 14.82 In the event that a re-opener is triggered, we will undertake an interim review of access charges and outputs. This means that we must issue a review initiation notice, triggering a request to DfT and Transport Scotland (or Transport Scotland only, in the case of a Scotland-specific re-opener) for a

restatement of their HLOSs and SOFAs. Government may choose to restate its HLOSs and SOFAs without changes or to update one or both.

- 14.83 We would undertake a thorough review of the efficiency of Network Rail's costs and the efficient cost of delivering the restated HLOSs. If the restated HLOSs cannot be delivered within the restated SOFAs we would inform government that this is the case following the process set out in Schedule 4A.
- 14.84 We would not generally expect to reassess the regulatory framework unless the particular circumstances of the re-opener suggested that this was appropriate.
- 14.85 We would then provide Network Rail with a new determination.
- 14.86 We are publishing a full procedural document following these conclusions that sets out how the re-opener provisions could be triggered and how we would conduct an interim review.

Corporation tax

Introduction

- 14.87 Corporation tax is a normal business cost and as such is one of the building blocks of the revenue requirement. Regulators have traditionally allowed for corporation tax by providing a tax wedge in the cost of capital. However, some regulators have decided to change their approach and allow a specific corporation tax allowance in order to match better, income with expected tax liabilities during a control period. We said in our draft determinations that we intend to provide Network Rail with a specific ex ante corporation tax allowance.

Change in corporation tax policy

- 14.88 We have said previously that it could be argued that by changing our corporation taxation policy the company will have been paid twice for some of its future corporation tax liabilities (since Network Rail was provided with a 'tax wedge' in the cost of capital for CP3 but is forecasting only to pay a very small amount of corporation tax in CP3).
- 14.89 DfT and Transport Scotland have said that they support making an adjustment for this double counting.
- 14.90 Network Rail, in its response to our September 2007 financial issues letter, said that it recognised that there may be a theoretical argument for an adjustment in relation to the period since April 2004, but it is not clear what if any adjustment should be made, as there are practical issues in determining what the adjustment should be. However, Network Rail then said in its response to our February 2008 advice to ministers that it was surprised that we were saying the company would have been paid twice for tax allowances if we did not make an adjustment in line with our change in policy.

Consultation responses and our assessment of those responses

- 14.91 There were not many responses to our June 2008 draft determinations about corporation tax. In Network Rail's response it has made a number of arguments about why it thinks the adjustment we proposed is not appropriate. These arguments can be grouped into three main areas.
- 14.92 First, Network Rail says that in similar circumstances in 2004 Ofgem did not make an adjustment when it changed its approach to corporation tax. Whilst Ofgem did not make an adjustment, it is not correct to say that the circumstances were similar as the taxation of electricity distribution companies was materially changing and the move to using a vanilla cost of capital and allowing actual corporation tax payments was made partly as a response to that issue. The Competition Commission (CC) has also said in a recent report⁸⁸ that it would recommend making an adjustment for the double counting of allowances for tax where a regulator changed its approach to remunerating the company for corporation tax liabilities.
- 14.93 Second, Network Rail argues that the assumptions used in our calculation of the double-count adjustment were not appropriate. The key issue here is making sure that the assumptions on corporation tax, the cost of debt and the cost of equity are reasonable when taken in conjunction with each other, i.e. if you assume that the tax wedge is lower than we have assumed then by definition either the cost of equity or cost of debt needs to be correspondingly higher to achieve the same allowed return. For example, one of Network Rail's suggestions is that at ACR03 we could have assumed that Network Rail's forecast corporation tax payments should have been substituted into the WACC calculation. However, if that assumption is made then either the cost of debt or cost of equity would have to be implausibly high to reconcile back to the allowed return at ACR03.
- 14.94 Third, Network Rail implies that it is inconsistent to use the actual level of debt in our debt forecast and make an adjustment for the CP3 tax double count. We are not being inconsistent. As part of implementing our financial policies we need to establish starting positions (i.e. at 1 April 2009) for both debt and corporation tax. For the starting positions for both debt and corporation tax we are using the forecast actual position at 1 April 2009.
- 14.95 Network Rail appears to be saying that we are adjusting for the outperformance of debt in the debt calculation but not in corporation tax. That is not the case. Network Rail's forecast of actual debt at 1 April 2009 and its forecast of corporation tax balances at 1 April 2009 include the effect of general outperformance and 'outperformance' as a result of the tax wedge, the government guarantee and receiving a risk adjusted cost of capital rather than just a rate of return based on forecast interest costs.

⁸⁸ *BAA Ltd – A report on economic regulation of the London Airport companies (Heathrow and Gatwick Airport Ltd)*, Competition Commission, September 2007. This may be accessed at <http://www.caa.co.uk/default.aspx?catid=5&pagetype=90&pageid=8779>.

Our determination on the tax double count

- 14.96 We maintain our view that Network Rail was allowed a tax wedge in the cost of capital in CP3 (there is a statement in the ACR03 final conclusions that Network Rail was provided with a pre-tax cost of capital) and that by not making an adjustment to reflect the change in approach to allow for future corporation tax liabilities would amount to the company being paid twice. We will therefore be making an adjustment.
- 14.97 We will make this adjustment by holding the amount of the estimated double count on account and we will reduce it every year by the amount of corporation tax that we estimate would be payable by Network Rail, until the balance on the account reaches zero. After that, we will fund Network Rail's efficient corporation tax payments through the regulatory tax allowance.
- 14.98 We appointed First Economics to estimate the size of the double count. The level of the allowed pre tax return (i.e. the WACC) is clear for each year of CP3 but the individual components of the cost of capital were not explicitly identified by us in ACR03.
- 14.99 Therefore, the individual components of the WACC calculation need to be estimated in order to calculate the implied allowance for corporation tax. There is a relatively standard approach to calculating WACC, so we can use that approach to estimate the individual components of the calculation. First Economics provided a central estimate and a range for the estimated double count. In simple terms, the method used to estimate the double count was as follows:
- first, they took the allowed pre-tax return (i.e. the WACC) in each year of CP3. This is 7.0% for the first two years of CP3 and 6.5% for the remainder of the control period.⁸⁹ The allowed pre-tax return will include a grossed up cost of equity that includes an implied "tax wedge", i.e. an allowance for corporation tax ;
 - then, they assumed a level of gearing of on average 71% for the central estimate. This assumption is the one used in the ACR03 joint financial model and is based on Network Rail's actual level of debt instead of a notional level of debt that is typically used by other regulators in determining the WACC of price controlled companies;⁹⁰
 - then, they made an assumption on the cost of debt. In the central case, First Economics assume that the real pre-tax cost of debt is 3.25% which

⁸⁹ These rates are on an annual basis. In their calculation, First Economics use the semi-annual rates used to determine Network Rail's revenue requirement in ACR2003.

⁹⁰ If you assume a lower gearing level then the estimated corporation tax allowance would be higher. Notional gearing levels used by other regulators at the time were typically lower than First Economics' central assumption.

was Network Rail's assumed financing cost used in the ACR03 joint financial model;⁹¹

- then, they deducted the assumed cost of debt from the pre-tax cost of capital to derive an estimated pre-tax cost of equity. The resulting pre-tax cost of equity in real terms for the central estimate is on average 14.6%;
- then, they multiplied the estimated pre-tax cost of equity by an assumed corporation tax rate of 30%, which was the corporation tax rate used in the ACR03 joint financial model. The resulting estimated corporation tax allowance in nominal terms is on average a range of £260m to £370m per annum, with a central estimate of on average £315m per annum. In total for CP3, the range is £1,235m to £1,760m per annum, with a central estimate of £1,570m; and
- then, they would have deducted the corporation tax payments used in the ACR03 joint financial model, but no corporation tax payments were forecast so this part of the calculation has no effect on the calculation of the adjustment.

14.100 We consider that the First Economics estimate of £1,570m for the adjustment is a robust estimate. However, given that the estimate is based on a number of assumptions and that ultimately the corporation tax allowance for CP3 was not explicit, it is reasonable for us to be cautious. Therefore, we have assumed that the double count is £1,300m, which is at the bottom end of the First Economics range.⁹²

The methodology for calculating the CP4 corporation tax allowance

Overall approach

14.101 We have reviewed Network Rail's forecast corporation tax payments and had a number of discussions with the company. Our approach to forecasting Network Rail's efficient corporation tax payments is to forecast the company's income and its profits chargeable to corporation tax and therefore its corporation tax payable. This involves using a conventional approach for the calculation of the adjustments to convert profits for accounting purposes to profits subject to corporation tax, such as substituting amortisation for capital allowances etc. We have largely based our forecasts of Network Rail's corporation tax payments on the company's own corporation tax computations for the last four years, taking into account the recent changes to capital allowances and where appropriate adjusting Network Rail's CP4 forecasts for our assessment of the efficient level of corporation tax payments.

⁹¹ See paragraph 13.4 and 13.9 *Access Charges Review: Final conclusions*. Office of the Rail Regulator, December 2003. This document can be accessed at <http://www.rail-reg.gov.uk/upload/pdf/184.pdf>.

⁹² This amount is in nominal prices.

14.102 We have largely used Network Rail's forecast income and expenditure for 2008-09 to obtain the opening position at 1 April 2009 and have adjusted those forecasts for our view of the efficient level of corporation tax payments in that year and to make them consistent with the other changes we have made to Network Rail's income and expenditure forecasts for 2008-09 for the purposes of our 1 April 2009 debt forecast.

Disaggregation

14.103 For the purposes of calculating Network Rail's allowance for corporation tax, we have calculated corporation tax separately for England & Wales and Scotland. This is consistent with our approach to disaggregation of the price control as explained in our work to support devolving responsibility for rail strategy and funding in Scotland to Scottish Ministers.⁹³

14.104 The opening corporation tax balances at 1 April 2009 have been derived for England & Wales and Scotland by splitting the corporation tax balances at 1 April 2006, based on the 1 April 2006 RAB split between the geographic areas. These balances are then rolled forward using the latest income and expenditure forecasts for each country. This is consistent with our disaggregation of the RAB and net debt between England & Wales and Scotland.

14.105 The metrics we have used to allocate balances/adjustments between England & Wales and Scotland for the period after 1 April 2006 are similar to those used to derive the opening RAB position and also used for the allocation of operating, maintenance, renewal and enhancements costs.

14.106 Table 14.1 shows the regulatory tax allowances for Network Rail in CP4 (Great Britain).

Table 14.1: Regulatory tax allowances for Network Rail in CP4

| Year | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total |
|--|----------|----------|----------|----------|-----------|-----------|
| Regulatory corporation tax payable | 2 | - | 6 | 8 | 10 | 26 |
| Adjustment for corporation tax double count | (2) | - | (6) | (8) | (10) | (26) |
| CP4 corporation tax allowance | 0 | 0 | 0 | 0 | 0 | 0 |
| Corporation tax double count account carried forward | 1,298 | 1,298 | 1,292 | 1,284 | 1,274 | |

⁹³ ORR's approach to regulation in Scotland: Conclusions, Office of Rail Regulation, December 2005. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/267.pdf>.

Roll forward of corporation tax balances into CP5

- 14.107 The CP4 corporation tax allowance will not be adjusted if Network Rail's actual position during CP4 is different to that forecast. However, we need to make clear our approach for determining the opening corporation tax balances for CP5.
- 14.108 In considering this issue we need to be mindful of the balance between risk and incentives. For example, if the company outperforms by, say, £100 and an ex ante approach has been adopted to the opening CP5 balances, then the corporation tax the company will pay on the outperformance will not be reimbursed by us so the net benefit is say £72.⁹⁴ 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 £72. Using an ex ante approach therefore reduces the net incentive to outperform but is less risky as the company's downside is protected.
- 14.109 If we adjusted the 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 lose £100 because of the underperformance. Therefore, the incentive is increased but the risk is also increased.
- 14.110 Network Rail, given its forecast brought forward corporation tax losses at the start of CP4, is not forecasting to make significant corporation tax payments until well into CP5 or CP6. The impact of our policy on the CP3 double count of corporation tax means that we are also not providing any funding for corporation tax in CP4. Therefore, the incentive effect on Network Rail of our corporation tax policy could be significantly diluted but we still need to determine an appropriate balance between risk and incentives.
- 14.111 The CP4 allowances for income, operating costs, maintenance costs, interest costs and corporation tax⁹⁵ are being set on an ex ante basis so Network Rail will bear the cost of an overspend and benefit from an underspend. Given our overall approach to risk and incentives we think it is appropriate that Network Rail is exposed to the net effect of an underspend/overspend in income, controllable operating costs, maintenance costs, interest costs and corporation tax. Therefore, we will not adjust the roll forward of corporation tax balances for variances in income, controllable operating costs, maintenance costs, interest costs and corporation tax.
- 14.112 For renewals and enhancements, our determination outlines the various protections we are planning to introduce to protect Network Rail from risk. We will take account of the changes in future revenue as a result of our

⁹⁴ This assumes a corporation tax rate of 28%.

⁹⁵ This means changes in corporation tax excluding the underlying differences in income and expenditure e.g. if a capital allowance rate changed.

policies on rolling forward the RAB and rolling forward the debt assumption used in the calculation of the ring-fenced fund, when rolling forward the corporation tax balances for variances in renewals and enhancements spend.

- 14.113 Some non-controllable costs are also protected from risk, e.g. there is a pass through for our fee. We will take account of the changes in future revenue as a result of our policies on some non-controllable costs, when rolling forward the corporation tax balances for variances in those non-controllable costs.
- 14.114 Therefore, although the approach taken in rolling forward the corporation tax balances is different for variances in income, controllable operating costs, maintenance costs, interest costs and corporation tax compared to that for variances in some non-controllable costs, renewals and enhancements spend, the approach is consistent with our general treatment of these costs in this determination.
- 14.115 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, are uncertain and Network Rail has not provided an estimate of the impact of these issues. Given this uncertainty we will assume that Network Rail does not receive any benefit from these schemes but we will adjust the roll forward of corporation tax balances in CP5 for any additional allowances that Network Rail has gained.

15. The regulatory asset base and amortisation

Introduction

15.1 This chapter sets out our determination of the treatment of the regulatory asset base and the level of the amortisation allowance for CP4. It explains the new approach we will use to “roll forward” the RAB in CP4 and the logging down of capex underspend and logging up of overspend. We also explain the regulatory treatment of reactive maintenance.

Background

15.2 The RAB is a key building block in our methodology for determining access charges since it forms the basis for calculating the level of allowed return.

15.3 In our advice to ministers in February 2007 we said that we would retain the high-level principles adopted for CP3⁹⁶ in CP4. These high-level principles are:

- 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 CP4, this should assist Network Rail when it raises additional debt without a government guarantee;
- 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
- simplicity: we will strive, where possible, to ensure that the calculation of the RAB remains as straightforward as possible.

RAB roll forward in CP3

15.4 We have rolled forward the RAB to 31 March 2009 using the assumptions made at ACR03 and adjusted as appropriate in line with Network Rail's audited regulatory accounts for the first four years of CP3 and Network Rail's forecasts for 2008-09 included in its SBP update and also updates and additional information submitted by Network Rail and assessed by us since then. The adjustments are made for items such as:

⁹⁶ *Access Charges Review: Final conclusions*. Office of the Rail Regulator, December 2003. This document may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/184.pdf>.

- additional investments not funded at the time of ACR03 and for outputs that have not been delivered in CP3;
 - the revenue due to be received by Network Rail in CP3 that we agreed in March 2004 could be deferred and instead added to the opening CP4 RAB; and
 - additions for the volume incentive and asset stewardship incentive.
- 15.5 This gives an opening CP4 RAB of £28.6bn in England & Wales and £3.3bn in Scotland, giving a total RAB for Great Britain of £31.8bn. A summary of adjustments made in each year of CP3 for the England & Wales RAB and the Scotland RAB is shown in tables 15.1 and 15.2.
- 15.6 We have previously set out that if Network Rail fails to deliver the required outputs in CP3, then it will not retain the associated financial benefit.⁹⁷
- 15.7 Network Rail has identified a number of areas where it is deferring renewals spend from CP3 to CP4. Given that this effectively represents a reduction in outputs in CP3 we have deducted this amount (together with the associated capitalised financing) from the opening CP4 RAB. Where the deferred expenditure has been proposed by Network Rail to be completed in CP4, and if we consider that its plans are reasonable, we have included the deferred expenditure as part of our determination. Network Rail has proposed that we should offset £260m of the deferred expenditure with other additional expenditure it is incurring in CP3. We have allowed for this additional expenditure in determining the net amount by which the RAB should be reduced. Should Network Rail not deliver the schemes associated with this additional spend or if it spends less than £260m, we will deduct the associated underspend from the CP5 opening RAB (including the capitalised financing benefit).
- 15.8 There are also some enhancement schemes that will not be completed or funds fully spent in CP3, e.g. telecoms enhancements and the safety and environment fund. We have discussed these issues with Network Rail and the company has provided us with updated expenditure projections for this work. Given that either the allocated funds have not been spent or the associated outputs have not been delivered in full, we have made an adjustment to reflect the underspend (including capitalised financing) of the ACR03 allowance. Where expenditure has been proposed by Network Rail to be completed in CP4, and where we consider that its plans are reasonable, we have included the deferred expenditure as part of our determination. For example, Network Rail made a strong case for carrying over some of the unspent safety and environment fund from CP3 to CP4 to fund worthwhile schemes such as level crossings closures.

⁹⁷ *Monitoring and Treatment of Network Rail's Underspend and Efficiency: Policy Statement*, Office of Rail Regulation, January 2006. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/273.pdf>.

- 15.9 The total deduction from the RAB at 31 March 2009 for renewals and enhancements that have not been delivered (net of additional renewals schemes) is £950m (including capitalised financing). Some of this, as indicated above, is deferred spend which we are allowing to be added back to the RAB at the appropriate time in CP4.
- 15.10 Network Rail has argued that the deductions we are making to the RAB related to renewals and enhancement deferrals and underspend are overstated because:
- the safety and environment fund will be spend in CP4 and;
 - we are not netting off overspend on WCRM with underspend on ERTMS and cab fitment.
- 15.11 Following a review of Network Rail's proposals, we are now allowing a significant amount of the safety and environment fund to be carried over into CP4.
- 15.12 We are not netting off overspend on WCRM with underspend on ERTMS and cab fitment as these are separate projects. Whilst we consider Network Rail will have delivered the outputs related to WCRM, the company agrees that it has not delivered the outputs on cab fitment and has not spent the allowed funds associated with ERTMS.
- 15.13 The proposed RAB adjustments take into account forecast expenditure in 2008-09 based on the SBP update for 2008-09 and updates and additional data submitted by Network Rail since then, which are necessarily estimates. We will make an adjustment to the opening RAB in CP5 (including where relevant the associated capitalised financing) for any difference between the final outturn figures for CP3 shown in the 2008-09 regulatory accounts and the forecast 2008-09 RAB additions in our determinations.

Table 15.1: Adjustments for the CP4 opening RAB in England & Wales

| £m (2006-07 prices) | 2004-05 | 2005-06 | 2006-07 | 2007-08 | 2008-09 | Total |
|---|---------|---------|---------|---------|---------|---------------|
| Opening RAB for the year per ACR03 | 17,739 | 20,356 | 22,088 | 23,204 | 24,276 | 17,739 |
| Renewals (as per ACR03 - without Signalling Review adjustment) | 2,836 | 2,679 | 2,184 | 2,209 | 2,000 | 11,907 |
| Enhancements in ACR03 | 1,156 | 445 | 326 | 266 | 236 | 2,429 |
| Amortisation | (1,375) | (1,392) | (1,395) | (1,402) | (1,407) | (6,971) |
| Closing RAB for the year per ACR03 | 20,356 | 22,088 | 23,204 | 24,276 | 25,105 | 25,105 |
| Adjustments to the RAB post ACR03 | | | | | | |
| Difference between actual 03-04 CAPEX outturn and ACR determination | (301) | (21) | (21) | (22) | (24) | (389) |
| EC4T adjustments | 14 | 15 | 2 | 2 | 2 | 36 |
| Adjustment to reflect signalling review 04-05 | (151) | (81) | 56 | 98 | 228 | 151 |
| Variance on emerging cost enhancements | (351) | 62 | 11 | (6) | (13) | (296) |
| Investments not funded in ACR03 | 37 | 27 | 141 | 306 | 624 | 1,136 |
| Deferrals of ACR03 renewals and enhancements | (185) | (295) | (285) | (229) | 82 | (913) |
| Total adjustments to RAB post ACR03 | (937) | (292) | (96) | 149 | 900 | (276) |
| Adjusted Closing RAB for the year | 19,419 | 20,859 | 21,879 | 23,100 | 24,829 | 24,829 |
| Adjustments to opening CP4 RAB | | | | | | |
| Deferred Grants to be added to the RAB | | | | | | 3,033 |
| Asset stewardship incentive | | | | | | 301 |
| Volume incentive | | | | | | 389 |
| 1 April 2009 RAB | | | | | | 28,552 |

Note: All adjustments include capitalised financing and amortisation adjustments, where appropriate.

Table 15.2: Adjustments for the CP4 opening RAB in Scotland

| £m (2006-07 prices) | 2004-05 | 2005-06 | 2006-07 | 2007-08 | 2008-09 | Total |
|---|---------|---------|---------|---------|---------|--------------|
| Opening RAB for the year per ACR03 | 2,231 | 2,419 | 2,588 | 2,663 | 2,732 | 2,231 |
| Renewals (as per ACR03 - without Signalling Review adjustment) | 357 | 337 | 242 | 233 | 211 | 1,379 |
| Enhancements in ACR03 | - | - | - | - | - | - |
| Amortisation | (168) | (168) | (166) | (165) | (163) | (830) |
| Closing RAB for the year per ACR03 | 2,419 | 2,588 | 2,663 | 2,732 | 2,780 | 2,780 |
| Adjustments to the RAB post ACR03 | | | | | | |
| Difference between actual 03-04 CAPEX outturn and ACR determination | (38) | (3) | (3) | (3) | (3) | (49) |
| EC4T adjustments | 1 | 1 | 0 | 0 | 0 | 2 |
| Adjustment to reflect signalling review 04-05 | - | - | - | - | - | - |
| Variance on emerging cost enhancements | - | - | - | - | - | - |
| Investments not funded in ACR03 | - | - | 2 | 12 | 101 | 115 |
| Deferrals of ACR03 renewals and enhancements | (8) | (13) | (4) | 6 | (15) | (35) |
| Total adjustments to RAB post ACR03 | (45) | (15) | (4) | 15 | 83 | 34 |
| Adjusted Closing RAB for the year | 2,374 | 2,527 | 2,599 | 2,682 | 2,813 | 2,813 |
| Adjustments to opening CP4 RAB | | | | | | |
| Deferred Grants to be added to the RAB | | | | | | 381 |
| Asset stewardship incentive | | | | | | 38 |
| Volume incentive | | | | | | 24 |
| 1 April 2009 RAB | | | | | | 3,256 |

Note: All adjustments include capitalised financing and amortisation adjustments, where appropriate.

Rolling forward the RAB in CP4

15.14 In CP3, the roll forward of the RAB was based on an ex ante forecast of renewals and enhancement expenditure. Adjustments are not generally made for actual efficiently incurred expenditure (whether higher or lower than the ex ante forecast). This provides Network Rail with a strong incentive and correspondingly higher risk as it retains all the benefits of outperformance but bears all the costs of overspend, even if this was efficiently incurred. We considered that this policy provided an appropriate balance between incentives and risk in CP3.

- 15.15 In February 2008, following earlier consultation, we set out in our update on the framework for setting outputs and access charges that we will add actual efficient capex to the RAB in CP4 (via an adjustment to the RAB at the beginning of CP5). We will do this such that:
- the incentives the company faces to outperform are equalised across the five years of the control period; and
 - Network Rail is able to log up on an annual basis any efficient overspend on capex.
- 15.16 This will provide a more appropriate balance between incentives and risk versus the status quo given the changes to the high-level financial framework for CP4. It will also mean that our approach is more closely aligned with that of other regulators. We did not set out in February 2008, however, exactly how this would be done. The methodology is set out below.
- 15.17 Amounts of efficient overspend and underspend being logged up and logged down will be calculated using a methodology that provides the same RAB adjustment, i.e. the adjustments will be symmetric.
- 15.18 Irrespective of any logging up or logging down of capex overspend and capex underspend, we will log down the RAB where outputs have not been delivered.

Logging down capex underspend

- 15.19 The purpose of the logging down mechanism is to provide appropriate incentives on Network Rail to deliver capex efficiencies, but to ensure that it does not benefit from failure to deliver required outputs. In dealing with capex underspend, we will therefore distinguish between those arising from efficiency gains and those due to the non-delivery of outputs.
- 15.20 Where Network Rail defers expenditure or brings forward expenditure, we will seek to assess whether the rephasing has been efficient or inefficient

Efficient underspend

- 15.21 Where Network Rail underspends efficiently on capex, 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 CP5. We will calculate the amount to be deducted from the CP5 opening RAB as:

Amount of underspend plus associated capitalised financing⁹⁸ from the year in which the underspend occurred, less 25% of the underspend

⁹⁸ That is the return that Network Rail earns from adding capex to the RAB as set out in our determination.

- 15.22 For example, if Network Rail underspent efficiently on its renewals programme in the first year of CP4 by £100m then we would reduce the RAB at the start of CP5 by £98m. This is the amount of the underspend (£100m) plus the associated capitalised financing benefit to the end of CP4 of £23m, less 25% of the underspend (£25m). If the underspend of £100m occurred in year three of CP4 then the RAB reduction would be £87m, which is the £100m underspend plus capitalised financing of £12m less £25m.
- 15.23 This means that Network Rail will always retain a financial benefit of 25% of the underspend, regardless of which year the underspend happens, which is equivalent to Network Rail retaining the benefit of outperformance for five years.
- 15.24 We believe that this should provide strong incentives on Network Rail to strive for capex efficiencies, whilst also representing a fair sharing of the benefits of those efficiencies with customers.
- 15.25 Our assessment of the amount to be logged down with regards efficient underspend will be carried out annually. However, we will only be able to undertake a full assessment of the extent of any non-delivery of capex projects at the end of the control period.

Underspend due to non-delivery of outputs (inefficient underspend)

- 15.26 Where Network Rail has underspent on its capex programme but this is due to a failure to deliver required outputs we will, at the beginning of CP5, reduce the RAB to reflect this and we will also reduce the RAB for the associated capitalised financing benefit received by Network Rail. Network Rail 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.

Non-delivery of outputs not associated with an aggregate underspend

- 15.27 We will also log down the RAB for any outputs that have not been delivered, regardless of whether this leads to an underspend or overspend. Each year in CP4 we will monitor delivery of outputs against the determination (and any agreed changes to this reflected in Network Rail's delivery plan). We will make an adjustment to the CP5 opening RAB (including associated capitalised financing) for non delivery of outputs in the same way as for inefficient underspend, regardless of whether there is an aggregate overspend.
- 15.28 Equally, where we have provided funding to Network Rail that is not explicitly linked to specific outputs (e.g. the Network Rail discretionary fund), we will deduct any underspend (including associated capitalised financing), irrespective of whether there is an aggregate capex overspend. We will make an adjustment to the CP5 opening RAB in the same way as for inefficient underspend.

15.29 Network Rail will not be penalised for rescheduling its capex programme within CP4 where outputs are still met and where there is no adverse impact on the serviceability or sustainability of the network in the short, medium or long term.

Logging up capex overspend – general approach

- 15.30 The purpose of the capex logging up mechanism is to promote appropriate risk-based investment decision-making by Network Rail and to enable the company to raise finance efficiently. It is therefore important that the methodology is clear and predictable. The approach taken also needs to balance appropriately the creation of the right incentives on Network Rail and minimising the regulatory burden.
- 15.31 In logging up capex overspend, we will differentiate between overspend associated with additional outputs, self-financing investments and the delivery of outputs required under the PR08 regulatory settlement.
- 15.32 In each case the onus will be on Network Rail to set out its overspend and the extent that it believes this should be logged up, justifying this in light of the guidelines set out below. Where capex does not meet the requirements set out below, it will not be added to the RAB.
- 15.33 Our assessment of the amount to be logged up will be carried out annually. Following the completion of our assessment each year we will state the amount to be logged up for inclusion at the beginning of the next control period.

Additional outputs

15.34 Where government 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. This is unchanged from the current approach.

Self-financing investment

15.35 Where Network Rail identifies and carries out investments that are self-financing (e.g. they reduce future costs), the cost of those investments would be added to the RAB (including capitalised financing costs) at the beginning of the next control period, provided that the company demonstrates that it had a strong business case and followed a sound appraisal process. This is unchanged from the current approach.

Overspend associated with delivery of required outputs

15.36 For capex overspend relating to required outputs, we will calculate the amount to be added to the CP5 opening RAB as:

Amount of overspend plus associated capitalised financing costs⁹⁹ from the year in which the overspend occurred, less 25% of the overspend¹⁰⁰

- 15.37 For example, if Network Rail overspent efficiently on its renewals programme in the first year of CP4 by £100m then we would increase the RAB at the start of CP5 by £98m. This is the amount of the overspend (£100m) plus the associated capitalised financing costs to the end of CP4 of £23m, less 25% of the overspend (£25m). If the overspend of £100m occurred in year three of CP4 then the RAB addition would be £87m, which is the £100m overspend plus capitalised financing of £12m less £25m.
- 15.38 This means that Network Rail will always bear a financial cost of 25% of the overspend, regardless of which year the overspend occurs, which is equivalent to Network Rail bearing the capitalised financing costs associated with the overspend for five years.
- 15.39 No RAB addition will be allowed where Network Rail can point to additional volumes or work compared to the assumptions in our determination, but where this is not associated with an overspend.
- 15.40 In assessing if an amount of overspend can be logged up, we will differentiate between renewals and enhancement expenditure.

Logging up capex overspend – treatment of renewals

- 15.41 In the case of renewals, the inclusion of overspend in the RAB will be based on an ex post efficiency assessment. Network Rail will need to set out to us the extent to which it considers any overspend to be efficient and justify this in line with the following guidelines. Where Network Rail does not justify overspend, it will not be logged up. We will undertake the efficiency assessment on an annual basis. This ensures that we can examine on a frequent basis the reasons for any overspend and make a decision, which will provide transparency and clarity to Network Rail and its customers and funders.
- 15.42 Except where Network Rail can demonstrate a deviation between our input price index and our explicit input price assumption, as described further below, any overspend relating to unit costs will be disallowed. This is because unit costs (with the exception of input prices) should be controllable by Network Rail, and the company is provided with protections elsewhere in the determination.
- 15.43 Overspend relating to additional volumes of work for renewals will only be added to the RAB if Network Rail can justify that the increase in volumes is

⁹⁹ That is the return that Network Rail earns from adding capex to the RAB as set out in our determination.

¹⁰⁰ In addition, for enhancements in England & Wales, Network Rail will bear the first £50m of overspend each year; it will not be added to the RAB.

efficient and could not have reasonably been foreseen at the time of the periodic review. For example, the company would need to demonstrate that the increase in volumes related to:

- improvements in asset policies that demonstrate optimisation of whole life costs. Network Rail would need to set out its starting volume assumption based on the regulatory determination and then set out and justify the incremental volume;
- systemic issues with asset condition that could not reasonably have been foreseen at the time of the periodic review. This makes the strong assumption that Network Rail's asset information is compliant with its network licence;
- unanticipated increases in traffic volume on a particular part of the network resulting in a need for increased renewals, in line with asset policies. Network Rail would need to demonstrate that the associated costs were greater than any additional revenues received in track access charges and payments under the volume incentive;
- work brought forward in order to minimise total cost. For example, we would generally expect to allow for the bringing forward of work based on a material change to policy concerning the way in which work is packaged where Network Rail can demonstrate whole life cost effectiveness. We would need to be convinced that the packaging of work and the bringing forward of the work (rather than deferring) was justified; or
- external factors that could not have reasonably been taken into account at the periodic review. Any insurance payments received would be netted off allowed capex costs. Where the design specification and asset management policies should mean that failure should not have occurred, we would not expect to allow the costs of renewal to be logged up.

Logging up or down the impact of changes in renewals input prices

15.44 As explained in chapter 8, we have adopted in full Network Rail's estimates of its projected input prices for operating, maintenance and renewals costs in CP4. These estimates were based on a detailed model developed for Network Rail by LEK, which we reviewed and considered, gave reasonable estimates of input prices. However, as LEK's study shows, there is a degree of uncertainty in these forecasts, particularly for renewals input prices. LEK's average estimate for renewals input prices in CP4 was 0.7% above RPI per annum (on average). This was in a wide range of uncertainty, ranging from around -1.5% per annum to around 3.5% per annum.

15.45 In its response to our draft determinations, Network Rail argued that worldwide commodity and contractor markets (which have a significant bearing on its renewals input prices) can show substantial fluctuations and that it has little or no ability to control these costs (it accepts that it has a far greater ability to influence operating and maintenance input costs). Although Network Rail accepts that it has a role to play in managing the impact of renewals input price inflation, it argues that it is not appropriate to rely solely

on the risk buffer to deal with these renewals input price risks. Consequently, in its response to our draft determinations Network Rail asked us to consider indexing its renewals input price inflation during CP4. And as noted in chapter 8, RIA also expressed concern to us about input price risk and provided evidence that input prices were, in its view, in excess of those proposed by Network Rail.

Our response

15.46 We have considered the arguments put to us by Network Rail and RIA and the merits of introducing an index. We recognise that there has been volatility in Network Rail's renewals input prices in recent years and that this is likely to continue into CP4. Having considered the arguments that both Network Rail and RIA have made we consider that it is appropriate to change the way we are treating input prices and allow for the indexation of renewals input prices.

15.47 In reaching our decision, we have explored the options and considered the implications of making this change.

15.48 We have identified four possible options:

- using LEK's input price model produced for Network Rail;
- developing a more simple index (e.g. a subset or variant of the LEK model) that would combine a limited number of indicators or indices for key categories of cost;
- using one of the two independent and publicly available indices of broad price trends in the construction/infrastructure sector. The two indices are BERR's construction output price index (COPI) and the infrastructure output price index (IOPI), which is a subset of the COPI; or
- adjust for Network Rail's actual incurred input prices.

15.49 We have evaluated the merits of all the approaches. Using LEK's approach, whilst likely to be the most accurate, would be more complicated, costly and time consuming. It would also introduce greater potential for dispute with Network Rail. Using a simplified approach (e.g. subset of LEK) would reduce the time, cost and complexity issue. However, the design of the simplified index would be subjective. The fourth option, to adjust for Network Rail's actual input prices would be difficult to do accurately since it would be difficult to separate input price effects from efficiency and, more importantly, it would reduce the incentive on Network Rail to manage these costs. We do not consider that this is a credible option

15.50 COPI is the output index measuring UK-wide construction output prices. The infrastructure sub-index forms part of COPI. It comprises new work in the utilities and major infrastructure related sectors. The components of both indices are shown in table 15.3. Ofwat currently uses the BERR's construction

output price index (COPI) to uplift capex allowances for water companies on an annual basis.¹⁰¹

Table 15.3: Components of COPI and IOPI

| COPI | IOPI |
|------------------------------|------------------------------|
| Private housing | Water |
| Public housing | Sewerage |
| Public works | Gas |
| Infrastructure (IOPI) | Communications |
| Private commercial | Air transport |
| Private industrial | Railways |
| | Harbours including waterways |
| | Roads |

15.51 We have reviewed COPI and IOPI and have decided to use IOPI for the following reasons:

- it tracks costs in infrastructure sectors – all of which have a mix of activity (i.e. engineering related) that is broadly similar to Network Rail's. We would expect these other sectors to face similar input price pressures (e.g. driven by the costs of key raw materials such as steel, energy costs and skilled engineering labour resources). The ability of these other sectors to influence these input costs is likely to be similar to Network Rail; and
- the weakness with COPI is that it includes non-infrastructure construction costs (including house building). A significant upturn or downturn in one area of the construction industry could affect the accuracy of COPI relative to Network Rail's input costs.

The adjustment mechanism

15.52 We will undertake an annual calculation in order to determine the amount of additional renewals expenditure that should be logged up or logged down to the RAB. Separate calculations will be made for England & Wales and Scotland. Any resulting RAB addition or deduction will be made at the end of CP4. We will undertake the calculation following the end of each financial year using the relevant values for the year.

15.53 IOPI (like COPI) combines both productivity and input prices, whereby any element of input price inflation is reduced by annual productivity gains. We will

¹⁰¹

See:

<http://www.berr.gov.uk/whatwedo/sectors/construction/ConstructionStatistics/OutputandEmployment/page19602.html>.

therefore adjust for this in our mechanism, in order to give a more valid measure of input prices.

15.54 The mechanism will be symmetrical, recognising both the upside and downside, for input price inflation increases and decreases. We will therefore log up or down accordingly.

Table 15.4: Assumptions on renewals frontier-shift and input prices in our determination

| | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|---------------------------|---------|---------|---------|---------|---------|
| Frontier-shift efficiency | 0.7% | 0.7% | 0.7% | 0.7% | 0.7% |
| Input price adjustment | -0.9% | -1.4% | -0.8% | -0.1% | -0.2% |

15.55 We will adjust for the difference between IOPI (expressed in annual percentage change), less actual RPI, plus our determination input price assumption, less our frontier-shift assumptions. Logging up or down will be made on an annual basis using the following calculation:

$$\text{Renewals price adjustment} = \text{IOPI} - (\text{RPI} + \text{our PR08 input price assumption} - \text{our frontier shift assumption})$$

+/-1% threshold

15.56 We will only log up or log down to the RAB if our final index values are greater or lesser than the input price assumption in our determination by 1%. This means that Network Rail will bear the risk and take any benefits within this range.¹⁰²

Incentives

15.57 We have considered the incentives that this mechanism would create for Network Rail and do not consider that any perverse incentives would be introduced. The calculation of the logging up or down is not dependent on Network Rail's actual input prices. It is based on IOPI which Network Rail cannot materially influence and it adjusts the input price values assumed in our CP4 determination (i.e. it does not apply to Network Rail's actual input prices). As such it is not open to undue influence by Network Rail.

Logging up capex overspend – treatment of enhancements

15.58 The logging up of enhancements overspend will be on the following basis:

- we will not make separate RAB additions for increased expenditure relating to enhancement projects where there is a tailored protocol in

¹⁰² The value of 1% is equivalent to approximately £20m in expenditure (given the approximate average level of renewals expenditure, at the GB level, of £2bn each year).

place, e.g. for Thameslink (which has its own pain/gain share mechanism) or where fixed price agreements are in place, e.g. for Airdrie – Bathgate;

- we will not make RAB additions for increased expenditure relating to 'funds' in the England & Wales HLOS, including NRDF, NSIP and the SFN fund; the small schemes fund in Scotland; and the expenditure relating to the safety and environment fund deferred from CP3 to CP4;
- for enhancement projects in England & Wales not covered by a tailored protocol or relating to NRDF, NSIP or the SFN fund, we will adopt a mechanistic approach to logging up overspend. In particular, we will log up 75% of any aggregate overspend (including capitalised financing), subject to Network Rail absorbing the first £50m of overspend in each year, and any manifestly inefficient overspend being disallowed; and
- for enhancement projects in Scotland we will undertake a specific ex post efficiency assessment (each year if necessary) on the three enhancement schemes in Scotland¹⁰³ covered by our approach.

15.59 Our approach has been revised following Network Rail's response to our draft determinations, following careful consideration. We summarise Network Rail's key concerns and provide our response to these below.

Network Rail's response

£75m threshold proposed in the draft determinations

15.60 Network Rail argued that the £75m materiality threshold proposed in the draft determinations would impose an inappropriate level of risk on the company and that our approach is inappropriate as we would not be allowing the company to retain the first £75m of underspend (beyond the five year period).

15.61 We have considered the company's argument in the context of our determination of the whole package and consider that it is reasonable for the company to bear some risk under this largely mechanistic approach to logging up in order to provide a stronger incentive on the company to manage its enhancement programme within the determination allowances. However, after further clarification of the schemes that this policy will apply to; changing the treatment of enhancement overspends in Scotland; and consideration of the whole CP4 determination package, we believe that it is appropriate to reduce the threshold for a RAB addition from £75m to £50m (relevant to England & Wales only).

15.62 We do not consider that it is necessary that the approach should be symmetrical. The provisions in the package for overspend are different to underspend. Thus, besides the £200m per annum risk buffer that is provided, our assumptions on enhancement costs in CP4 include allowance for risk,

¹⁰³ The three schemes are Glasgow airport rail link, Glasgow – Kilmarnock and Borders railway.

based on the the 80th percentile value ('P80') from Network Rail's risk analysis.

Reprofiling

- 15.63 Network Rail has proposed that £100m of enhancement expenditure should be reprofiled out of the first year of the control period into the next two years to reflect delivery risks. However, the company has said that it still aims to spend the money in year one. It is concerned that if it did so it would be unfairly hit by the overspend framework. We will apply the framework in a way that Network Rail will not be penalised if it spends this £100m in the first year of CP4.
- 15.64 Network Rail is also concerned more generally that it could be penalised by rephasing of activity during CP4. The policy is not intended to penalise justified deferral of enhancement expenditure that is agreed and reflected in its delivery plan.

Scotland

- 15.65 Network Rail pointed out that because there are only three enhancement schemes in Scotland to which this policy applies our approach is not practical for Scotland. We discussed the treatment of Scottish schemes with Network Rail and Transport Scotland. In the light of these discussions, as we set out above, we consider that the most appropriate approach is to conduct a specific efficiency assessment of any overspend on the Scottish schemes.
- 15.66 We have considered whether it is appropriate for Network Rail to bear an appropriate share (in Scotland) of the first £50m of any overspend. Given that we are changing from a largely mechanistic approach to a more detailed review of any overspend (similar to renewals) we do not consider that it is necessary or appropriate for Network Rail to bear the full costs of any overspend up to a defined threshold.

Manifestly inefficient test

- 15.67 Network Rail sought further explanation from us on how we would determine whether expenditure was manifestly inefficient. For the relevant enhancements in England & Wales, the general presumption is that overspend beyond the £50 million threshold will be added to the RAB. We would assume that Network Rail, responding to the incentives of the policy (i.e. it bears the first £50 million and then 25% of additional overspend) and managing its capital programme effectively, will maintain strict cost controls, but we still see the importance of retaining a 'back-stop' test to ensure that there is some assurance on what is added to the RAB.
- 15.68 Where overspend exceeds the £50million threshold, Network Rail will have to provide an explanation to us as to why the additional investment is justified. This will ensure overspend that is outside the scope of the HLOS requirements (if relevant), not meeting a customer reasonable requirement,

not related to railway activity or 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.

- 15.69 We consider that this approach provides an appropriate balance between improving incentives and minimising the regulatory burden.

Thameslink

- 15.70 The Thameslink project protocol that has been agreed between Network Rail and DfT, and which will be enforced by us, contains a proposed target price for the infrastructure works (which will be added, ex ante, to the RAB in CP4), with 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 CP5 to reflect the outturn according to these arrangements. The objective of the arrangements is that Network Rail is strongly incentivised to manage the financial risk of the project but is not exposed to open ended financial risk. We have said that we support such arrangements in principle and indeed they are fairly common in large, complex projects. However, we said that we would review whether we believed the right balance had been struck between incentives and protections against financial risk once we had determined the overall framework of risk and reward under the periodic review.
- 15.71 The first thing to note is that there is already a significant allowance for risk included in the target price through a contingency, on top of which Network Rail will earn its cost of capital. Network Rail will also be protected against significant efficient cost overruns if these were large enough to trigger a re-opener. In assessing appropriate incentives, we have made comparisons with other industries, seeking to find comparable examples in terms of complexity of work and exposure to risk.
- 15.72 The proposals put forward by DfT and Network Rail are for Network Rail to bear a relatively small proportion of cost overruns, with a maximum liability for key output 1 of £50m (3% of project costs). We believe that, combined with the inclusion of several risk contingencies in the target price, this places fairly weak financial incentives on Network Rail. We propose to double the proportion of cost overruns to be borne by Network Rail compared with the DfT/Network Rail proposals, thereby doubling Network Rail's maximum liability on key output 1 to £100m. This will significantly increase the financial incentives facing the company without exposing it to undue financial risk.
- 15.73 In its response to our draft determinations, Network Rail said it did not believe that an increase in the proportion of 'pain' it could bear was necessary to provide a strong delivery incentive. It did not provide any reasons to support this view and we are not persuaded.

Non-capex additions to the RAB in CP4

15.74 In line with regulatory good practice, only capex will be added to the RAB from the start of CP4. Incentive payments, which we have historically added to the RAB at the start of the next control period, will instead be remunerated via an operating expenditure (opex) style memorandum account. This would work by 'logging up' the payment to the account during the control period. Monies could then be released from this account over an appropriate period, which will generally be across the subsequent control period. Respondents to our September 2007 financial issues consultation letter supported this approach.

Accounting treatment of reactive maintenance

15.75 Network Rail in the past used to account for certain reactive maintenance costs in civils and operational property, of approximately £100m per annum, as capital expenditure (renewals). The calculation of the revenue requirement in ACR03 reflected this treatment. However, since 2003-04, Network Rail has accounted for these costs in its statutory accounts as an operating expenditure (maintenance) following a change to UK GAAP (generally accepted accounting principles).

15.76 In order to improve transparency we consulted earlier in PR08 on remunerating these reactive maintenance costs in the year concerned (i.e. for the purpose of calculating the revenue requirement for CP4, to treat them in the same way as operating and other maintenance costs). 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 long-run steady state renewals to be lower by an equivalent amount. This means that a change in this policy would not have had a material impact on the revenue requirement in CP4.

15.77 However, in its SBP and SBP update Network Rail did not identify these costs as an operating expense (maintenance); they remain under capital (renewals) expenditure. We have conducted our assessments of Network Rail's expenditure and calculations of its revenue requirement during PR08 assuming that reactive maintenance is capitalised. As such, we are not making this change for CP4 but we will consider the issue further during CP4 for a possible change in CP5.

Amortisation

15.78 Under the building block methodology described in chapter 2, all capital expenditure is added to the RAB (except for capex allocated to the RFF). The RAB is then amortised (or depreciated) over time and Network Rail is provided with revenues to match that level of amortisation. The amortisation charge therefore determines how much of Network Rail's capital expenditure in CP4 will be remunerated through access charges in CP4 and how much will need to be funded by debt and repaid by customers and funders over a longer time period.

- 15.79 We have already established the key principles we will use to derive the level of the amortisation charge. Amortisation in CP4 will be based on average annual long-run steady state capital expenditure (i.e. renewals) as we set out in September 2006.¹⁰⁴ The total allowance for amortisation in any year should be broadly equivalent to the long-run 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).
- 15.80 Network Rail did not provide its own forecast of long-run annual average steady-state renewals. The amortisation charge in these determinations is therefore based on our own view of steady-state renewals expenditure, which is based on our engineering analysis set out in chapter 5. This is just over £2bn per annum at 2008-09 expected efficiency levels. We consider that the amortisation charge should also take account of the scope for future catch-up efficiency improvement, based on our assessment of the efficiency gap in renewals at the end of CP3. This means that both current and future customers and funders will be sharing the cost burden of Network Rail's degree of inefficiency.
- 15.81 In addition, our advice to ministers in February 2007 also confirmed that we will be amortising the non-capex additions that we are making to the opening CP4 RAB of £4.2bn. We will do this on a straight-line basis over 30 years.
- 15.82 In total this gives an amortisation charge of some £1.5bn per annum. The table below summarises our calculation of amortisation and the split between England & Wales and Scotland.

Table 15.5: Calculation of amortisation

| £m (2006-07 prices) | GB | Scotland | England & Wales |
|---|--------------|------------|-----------------|
| Pre-efficient long-run annual average renewals | 2,061 | 249 | 1,812 |
| Catch-up efficiency (renewals) | 36% | 36% | 36% |
| Post efficient long-run annual average renewals | 1,319 | 159 | 1,160 |
| Amortisation of non-capex RAB additions | 139 | 15 | 124 |
| Total amortisation per annum | 1,458 | 174 | 1,284 |

¹⁰⁴ *Approach to the amortisation of Network Rail's regulatory asset base*, Office of Rail Regulation, September 2006. This may be accessed at www.rail-reg.gov.uk/upload/pdf/pr08-amortisation-let-290906.pdf.

16. Revenue requirements

Introduction

16.1 This chapter sets out our determination for Network Rail's gross revenue requirement in CP4, based on our expenditure assessment and financial framework. The gross revenue requirement is recovered through access charges, network grant and other income (e.g. from property rental).

Revenue requirement

16.2 Table 16.1 to 16.3 summarise our determination for the gross revenue requirement for England & Wales, Scotland and Great Britain.

Table 16.1: Network Rail's CP4 revenue requirement – England & Wales

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total | SBP update |
|----------------------------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|
| Maintenance | 988 | 947 | 905 | 868 | 830 | 4,539 | 4,407 |
| Controllable opex | 656 | 638 | 612 | 588 | 564 | 3,059 | 3,429 |
| Non-controllable opex | 303 | 321 | 331 | 338 | 342 | 1,635 | 1,649 |
| Schedule 4 and 8 | 159 | 142 | 144 | 115 | 109 | 669 | 871 |
| Allowed Return | 1,373 | 1,474 | 1,560 | 1,623 | 1,676 | 7,706 | 7,947 |
| Amortisation | 1,284 | 1,284 | 1,284 | 1,284 | 1,284 | 6,420 | 7,620 |
| Tax | - | - | - | - | - | - | 68 |
| Gross revenue requirement | 4,764 | 4,805 | 4,836 | 4,817 | 4,806 | 24,028 | 26,090 |

Table 16.2: Network Rail's CP4 revenue requirement – Scotland

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total | SBP Update |
|----------------------------------|------------|------------|------------|------------|------------|--------------|--------------|
| Maintenance | 103 | 99 | 95 | 91 | 88 | 477 | 483 |
| Controllable opex | 66 | 64 | 62 | 59 | 57 | 308 | 347 |
| Non-controllable opex | 26 | 29 | 30 | 30 | 31 | 146 | 148 |
| Schedule 4 and 8 | 10 | 9 | 9 | 7 | 7 | 43 | 57 |
| Allowed Return | 157 | 168 | 175 | 178 | 177 | 855 | 909 |
| Amortisation | 174 | 174 | 174 | 174 | 174 | 870 | 1,070 |
| Tax | - | - | - | - | - | - | 17 |
| Gross revenue requirement | 536 | 544 | 545 | 540 | 534 | 2,699 | 3,029 |

Table 16.3: Network Rail's CP4 revenue requirement – Great Britain

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total | SBP update |
|----------------------------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|
| Maintenance | 1,091 | 1,047 | 1,000 | 960 | 918 | 5,016 | 4,989 |
| Controllable opex | 723 | 702 | 674 | 647 | 621 | 3,368 | 3,776 |
| Non-controllable opex | 329 | 350 | 361 | 369 | 373 | 1,781 | 1,796 |
| Schedule 4 and 8 | 170 | 151 | 153 | 123 | 116 | 712 | 927 |
| Allowed Return | 1,530 | 1,641 | 1,734 | 1,801 | 1,853 | 8,561 | 8,856 |
| Amortisation | 1,458 | 1,458 | 1,458 | 1,458 | 1,458 | 7,290 | 8,689 |
| Tax | - | - | - | - | - | - | 86 |
| Gross revenue requirement | 5,301 | 5,349 | 5,381 | 5,357 | 5,340 | 26,728 | 29,119 |

Figure 16.1 shows the gross revenue requirement, for Great Britain, on an annual basis, for CP3 and CP4 and compares this to Network Rail's proposals in its SBP update.

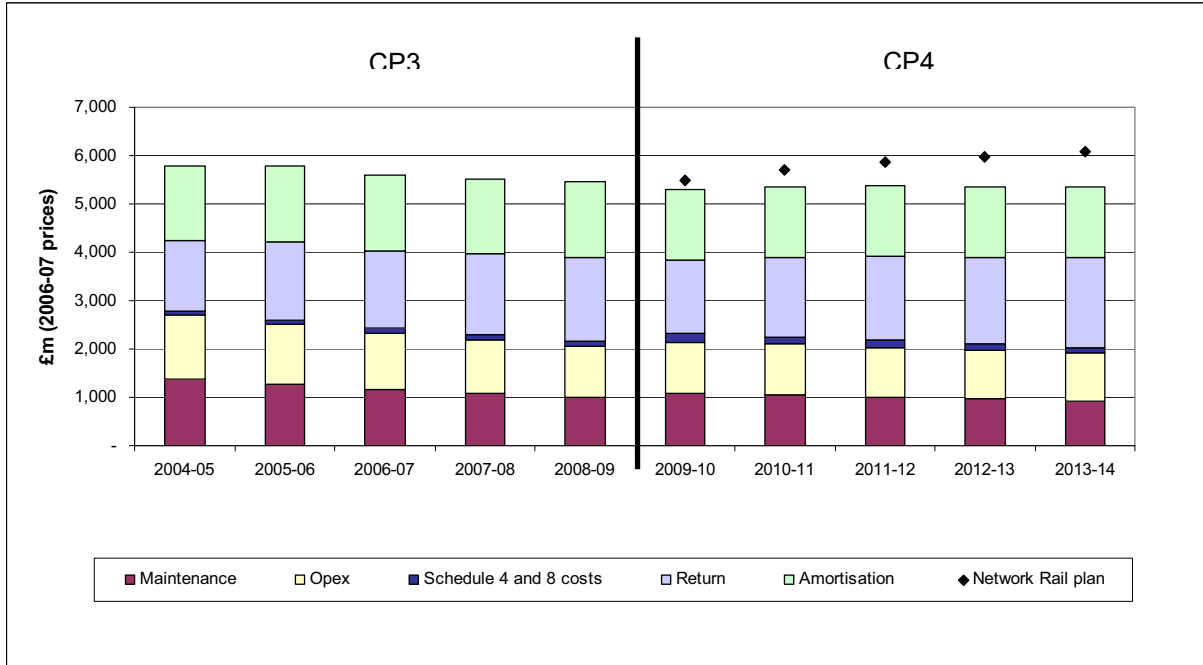


Figure 16.1: Gross revenue requirement in CP3 and CP4

17. Financeability

Introduction

- 17.1 We have a duty to act in a manner that will not render it unduly difficult for Network Rail to finance its activities. Condition 12 of Network Rail's network licence also requires the company to use all reasonable endeavours to ensure that it maintains an investment grade credit rating. This means that besides making decisions on each of the separate building blocks that make up our determination, we need to satisfy ourselves that the overall package (which includes protections to deal with risk and uncertainty), and the level of access charges and income we assume Network Rail will earn, will enable it to finance itself in CP4 on reasonable terms. This is particularly important given our assumption that a proportion of new debt in CP4 will be raised by Network Rail without the benefit of the government guarantee.
- 17.2 We consulted in September 2007 on our approach to assessing financeability as part of the PR08 process, and confirmed our approach in our update on the framework for setting outputs and access charges in February 2008¹⁰⁵ and in our draft determinations.
- 17.3 In our view, this determination should enable Network Rail to obtain a solid investment grade credit rating on the basis that it operates efficiently.¹⁰⁶ We assess financeability 'in the round'. In other words, we take into account a suite of financial indicators, consistent with those used by the ratings agencies, and the business risks and regulatory protections provided to Network Rail in our determination as a whole to inform our assessment.
- 17.4 Ultimately it is for the ratings agencies to decide the credit rating for Network Rail. They will assess factors such as the financial strength of the company, the risks that Network Rail faces, the regulatory framework, and the quality of the company's management. The agencies do not have a shared view of these factors and all place emphasis on different elements in forming their opinions.

¹⁰⁵ *Periodic Review 2008: Financial issues update and further consultation*, Office of Rail Regulation, 6 September 2007. This may be accessed at www.rail-reg.gov.uk/upload/pdf/pr08-financial-issues-let-060907.pdf.

¹⁰⁶ Investment grade ratings from the three main ratings agencies (Standard & Poors, Moody's Investors Services and Fitch Ratings) mean that the issuer is unlikely to default on its debt repayments.

Solid investment grade and financial indicators

- 17.5 We interpret a solid investment grade credit rating to be BBB+/Baa1 or above.¹⁰⁷ This is consistent with the view expressed by the Competition Commission in its 2007 report on the economic regulation of Heathrow and Gatwick airports.¹⁰⁸ A rating at these levels means that there is a low probability of default.
- 17.6 Following discussion with the ratings agencies, the financial indicators we are using to assess financeability are set out in table 17.1. We are also including the definitions we have used to calculate these indicators, since different definitions are available. This range of indicators allows us to consider both long-term solvency and shorter-term cashflow in CP4. We have considered the overall set of indicators across the control period as whole, rather than relying on any particular indicator or any particular year.

Table 17.1: Financial indicators

| Indicator | Definition |
|--------------------------------------|--|
| Adjusted interest cover ratio (AICR) | FFO* less capital expenditure to maintain the network in steady state <i>divided by</i> net interest** |
| FFO / Interest | FFO <i>divided by</i> net interest |
| Debt*** /RAB (Gearing) | Net debt <i>divided by</i> RAB |
| FFO / Debt | FFO <i>divided by</i> net debt |
| RCF**** / Debt | FFO less net interest <i>divided by</i> net debt |

Notes: * Funds from operations (FFO) is defined as gross revenue requirement less opex less maintenance, less schedule 4 & 8 costs less cash taxes paid. ** Net interest is the total interest cost including the FIM fee, but excluding the principal accretion on index linked debt. *** Debt is as defined in the Regulatory Accounting Guidelines. **** Retained cash flow (RCF) is defined as FFO minus net interest.

Financing assumptions

- 17.7 We have said that in assessing the financeability of our determination, we would take into account Network Rail's proposed debt structure to the extent that this is consistent with the financing strategy that an efficiently financed regulated utility could be expected to have in place based on historic, present and forward looking market conditions.
- 17.8 Network Rail provided us with a financing plan on a confidential basis alongside its SBP update in April this year and updated this with a further

¹⁰⁷ The BBB+ terminology is used by Standard and Poor's and Fitch Ratings. Baa1 is used by Moody's.

¹⁰⁸ *BAA Ltd – A report on economic regulation of the London Airport companies (Heathrow and Gatwick Airport Ltd)*, Competition Commission, September 2007. This may be accessed at www.caa.co.uk/default.aspx?catid=5&pagetype=90&pageid=8779.

confidential submission in September 2008. We have considered the plan in light of the evidence available for other regulated utilities, and consider it broadly to reflect an efficient strategy. We have therefore modelled financeability using Network Rail's proposed financing strategy. However, we have used our own assessment of the appropriate cost of debt and net cash flows.

- 17.9 This is a departure from regulatory precedent, where a notional capital structure is generally used to assess financeability. However, we consider that this is appropriate given Network Rail's particular circumstances (in particular constraints on its capital structure) and the importance we attach to ensuring Network Rail faces a hard budget constraint.
- 17.10 As explained in chapter 14, part of Network Rail's expected profits derived from its allowed return will be earmarked for a ring-fenced fund (RFF). Since this RFF expenditure is akin to a railway dividend which can be deferred at Network Rail's discretion, it is available for Network Rail to service its debt and so we have included it as free cash flow in the calculation of the financial ratios.
- 17.11 We have considered financeability at the GB level only, as we expect Network Rail to continue to finance itself on a GB-wide basis.

Responses to our draft determinations and further work

- 17.12 The only substantive response to our draft determinations on financeability issues was from Network Rail. Its main concern related to the interest cost assumptions we had used in our financeability analysis which Network Rail said were too low. Network Rail also said that it is inappropriate for us to assume that the annual risk buffer is used to reduce debt.

Our assessment of Network Rail's response

- 17.13 We accept that the interest cost assumptions we used at draft determinations for new corporate debt in particular now look optimistic, at least in the short term. We have increased our assumptions in line with CEPA's recommendations, as set out in chapter 14. We have also increased our assumed cost of new government guaranteed index-linked debt. We have used Network Rail's assumed proportions of index-linked and nominal debt.
- 17.14 We do not accept that it is inappropriate for financial modelling purposes to assume that the annual risk buffer is used to reduce debt. Our base case assumption clearly must be that Network Rail performs in line with our determination and does not require use of the risk buffer. We have though undertaken a sensitivity test which assumes that the risk buffer is used by Network Rail to fund discretionary investment rather than pay down debt. It will clearly be for Network Rail to decide whether to do this.

Our assessment of financeability

17.15 Table 17.2 shows the ratios that result from our modelling of the determination for each of the four key financial indicators. The calculations are based on the values for the building blocks and other financial parameters, such as RPI, set out elsewhere in this document, as well as Network Rail's proposed financing strategy.

Table 17.2: Modelled values for the financial indicators

| Based on nominal prices | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Annual average |
|-------------------------|---------|---------|---------|---------|---------|----------------|
| AICR | 1.69 x | 1.68 x | 1.70 x | 1.68 x | 1.69 x | 1.69 x |
| Debt / RAB (Gearing) | 62.5% | 63.5% | 63.5% | 63.2% | 62.7% | 63.1% |
| FFO / Interest | 3.30 x | 3.17 x | 3.12 x | 3.06 x | 3.03 x | 3.13 x |
| FFO / Debt | 14.0% | 13.4% | 13.2% | 13.0% | 13.0% | 13.3% |
| RCF / Debt | 9.7% | 9.1% | 9.0% | 8.8% | 8.8% | 9.1% |

17.16 These ratios are generally stronger than those reported in our draft determinations despite us now assuming higher interest costs. All other things being equal, our higher interest cost assumptions (combined with slightly higher debt forecasts) have a negative impact on financial ratios. However, there are a number of other changes to our draft determinations which more than offset this. The principal changes are:

- a higher allowed rate of return;
- the gradualist approach to unsupported debt which results in a higher proportion of lower cost debt being raised; and
- a higher proportion of supported index-linked debt.

17.17 We consider that these ratios, considered in the round and combined with our assessment of the risks facing Network Rail compared to those facing other regulated network industries and the very significant protections provided to the company as part of the overall package for CP4, are consistent with a solid investment grade credit rating, in current and prospective market conditions.¹⁰⁹

¹⁰⁹ As noted in chapter 14, First Economics conducted a study for us examining the risks faced by Network Rail compared to those faced by other regulated network industries.

Sensitivity testing

- 17.18 As part of our assessment of financeability we have tested the sensitivity of the financial ratios resulting from our modelling to changes in our regulatory assumptions. In particular, we have tested a number of scenarios and also used Monte Carlo simulation to help identify the robustness of Network Rail's financial position in the face of cost and revenue uncertainty.¹¹⁰
- 17.19 We have used Monte Carlo simulation to identify the sensitivities under a range of operating circumstances in CP4, reflecting plausible fluctuations that may be expected in Network Rail's costs and revenues during the control period. To do this we developed a range of probability distributions for each of the key income and expenditure categories, based on an assessment of historic data for Network Rail and Railtrack. We have also considered the possibility of Network Rail under or over achieving the efficiency assumptions in CP4, the volatility in expenditure in other regulated sectors and also the volatility in expenditure by other European rail infrastructure managers over the last decade.
- 17.20 Based on our scenario analysis and the Monte Carlo simulation, we consider that our determination should enable Network Rail to maintain a solid investment grade credit rating in the face of a range of fluctuations in cash flow.

¹¹⁰ Our Monte Carlo simulation generates a large number of possible outcomes for CP4 based on probability distributions of key financial parameters and thereby provides information on how likely Network Rail is to achieve certain financial ratios in CP4.

PART D: ACCESS CHARGES, NETWORK GRANT AND OTHER INCOME

18. Overview of access charges, network grant and other income

Introduction

18.1 This chapter provides background in relation to our calculations of access charges, network grant and other single till income which we are determining for CP4. The chapter is structured as follows:

- an overview to this part of the document is provided;
- background to our work to determine access charges is provided;
- the purpose of access charges is explained;
- our charging objectives are set out;
- the arrangements for determining access charges in CP4 are explained; and
- the process for producing the audited and approved final price lists and schedules of charges is summarised.

Overview

18.2 Network Rail recovers its gross revenue requirement through the income it receives from:

- track access charges from passenger and freight operators;
- network grant which we allow Network Rail to receive from government in lieu of track access charges;
- the station long term charges paid by users of stations; and
- other income.

18.3 Under the single till approach we use to determine access charges, the variable track access charges, station long term charges and other income are subtracted from the gross revenue requirement. This leaves the net revenue requirement, which is funded by fixed track access charges and network grant in lieu of fixed track access charges.

18.4 In the following chapters in this part of the document we set out our determination for the track access charges and station long term charges for CP4. We also set out the network grant payments we are allowing government to make to Network Rail in lieu of access charges, and the assumptions we have made on the level of other income (e.g. from property

rental) that Network Rail will receive in CP4. We also discuss a number of other charging issues.

Background to access charges

- 18.5 Charges for access to the railway infrastructure have been in place since privatisation. Access charges were first included in the track access contracts between train operators and Railtrack¹¹¹ as the first franchises were let or when the first freight track access contracts were approved.
- 18.6 The current structure of access charges was largely determined at the periodic review 2000 (PR2000) for passenger train operators and the review of freight charging policy 2001 for freight train operators. Key features of the current structure are:
- transparent and deterministic price lists for variable track access charges so that an operator who runs the same rolling stock (and if freight, rolling stock carrying the same commodity type) will pay the same variable access charges;
 - all operators pay variable track access charges for running on the network (on the basis of the current capacity and capability);
 - variable usage charges are different for each vehicle type (or vehicle/commodity mix for freight) but based on a top down and network wide level of variable cost which is allocated between vehicles with reference to relative damage caused (through vertical forces only at present);
 - the traction electricity charge is calculated using modelled consumption rates from TRATIM,¹¹² with prices set for 1999-2000 and then rebased each year by applying the index of average electricity prices (moderately large users index). The traction electricity charge currently includes a mark-up to recover the electrification asset usage charge;
 - the capacity charge reflects increased schedule 8 (performance regime) costs from increases in traffic on the network, additional traffic makes it more difficult for Network Rail to recover from performance incidents; and
 - the fixed track access charge recovers Network Rail's net revenue requirement once the variable charges listed above are subtracted from the gross revenue requirement along with other single till income. This charge is paid by franchised passenger train operators only.

¹¹¹ The original criteria for such charges for franchised passenger operators are set out in *Railtrack's track access charges for franchised passenger services: developing the structure of charges, a policy statement*, Office of the Rail Regulator, November 1994. This may be accessed at www.rail-reg.gov.uk/upload/pdf/fgt-FMC_cmrpte_230108.pdf. The equivalent document for freight operators may be accessed at www.rail-reg.gov.uk/upload/pdf/21.pdf.

¹¹² A simulation model used to estimate the level of electricity consumption of different vehicles and on different types of route.

- 18.7 The structure of charges was not reviewed in ACR03. The primary focus of ACR03 was to determine the aggregate level of access charges. The significant increase in Network Rail's costs and revenue requirement resulting from ACR03 was reflected through increases to the fixed track access charges and network grant. Only very minor changes were made to the structure of access charges with the intention of reviewing this in more detail before PR08.
- 18.8 Following ACR03, we undertook a specific review of the structure of costs and charges in 2005 (SOCC review 2005), which covered a wide range of issues.¹¹³ A main aim of the SOCC review was to consider if the increased allowed expenditure, entirely recovered through increases to the fixed track access charges and network grant at ACR03, needed to be redistributed to reflect the appropriate proportion of these additional costs that vary with changes in traffic levels and should therefore be recovered through the variable charges. However at the end of the SOCC review no changes were made, since we did not consider that Network Rail's knowledge of its costs had developed sufficiently at that time to provide enough confidence to revise the level of cost variability, and hence give rise to changes in the level of the variable usage charges.
- 18.9 Table 18.1 summarises the access charges and shows the type of train operator that pays them.

Table 18.1: Access charges categorised by those who do or will pay them

| Charge | Payable by |
|--|---|
| Variable usage charge Electrification asset usage charge Capacity charge | All operators |
| Coal spillage charge | All freight operators for coal services |
| Traction electricity charge | All operators who run electrically powered services |
| Station long term charge | Franchised passenger, and other (open access) passenger operators who call at particular stations |
| Freight only line charge (introduced for CP4) | Freight train operators who transport electricity supply industry coal and spent nuclear fuel |
| Fixed track access charge | Franchised passenger operators |

- 18.10 The charges set out in our determination recovers the costs set out in the determination. That is they relate to the capability, capacity and functionality

¹¹³ Documentation from this review may be accessed at www.rail-reg.gov.uk/server/show/nav.176.

of the network as described in the determinations, including any enhancements included in the determinations. Additional charges can be levied where services require enhancements to the network during a control period. The principles behind establishing such charges are set out in our investment framework.¹¹⁴ In implementing this periodic review we intend to preserve additional charges contained in part 5 of schedule 7 of track access contracts.

- 18.11 In our consultation (18 July 2008) on the freight schedule 7 consistent with our draft determinations we proposed to change the basis of network capability from that at 1 April 2001 to that at 1 April 2009, above which freight operators would incur incremental costs. A freight operator responded that this was not appropriate as it could bring additional capability that has lapsed without going through formal network code processes (including consultation) which would currently be replaced at Network Rail's own cost being billable to the freight operator wishing to use the additional capability. Having reviewed this and being aware of issues around capability including the ability for various routes to be taken out of use for a short time in the run up to 1 April 2009 we propose to leave the baseline in Schedule 7 unchanged at 1 April 2001. This recognises that while the network code changes should be open to consultation, that other changes e.g. to signal box opening hours might not. In principle this baseline should be updated at a periodic review to reflect Network Rail's new funding arrangements and we would expect the company to work with freight operators to establish a process where such a change can be made at future periodic reviews with appropriate agreement around short term changes to capability around the change of control period or other changes that are agreed on the basis that Network Rail would fund the return of the particular capability.

Purpose of access charges

- 18.12 We have undertaken extensive work in PR08 to ensure that we have an appropriate structure of access charges. The structure of access charges is important because of the role charges play in decision making within the industry.
- 18.13 Under an industry structure where rail infrastructure and train operations are separate, where commercial disciplines apply including along the supply chain to manufacturers and vehicle owners, and where there is a range of train operators, other private sector companies and public sector bodies making decisions about vehicle design and train services, access charges are fundamental. Charges serve four purposes, providing:

¹¹⁴ Further details on our investment framework may be accessed at www.rail-reg.gov.uk/server/show/nav.190. We consulted on updated guidance on how station long term charges change in response to station investments under various different approaches. This consultation document may be accessed at www.rail-reg.gov.uk/upload/pdf/Inv_frmwrk_guid_stat_charg.pdf. The final conclusions are due to be published shortly.

- a mechanism for Network Rail to recover the efficient costs it incurs in providing track and station infrastructure used by train operators;
- a means to allocate costs to, and be recovered from, those that cause those costs to be incurred;
- signals to train operators, their suppliers and funders for the efficient use and development of vehicles and the infrastructure (subject to other policy objectives and constraints); and
- incentives to Network Rail to outperform the regulatory determination (through the form of price cap regulation employed).

18.14 However, as has been widely discussed throughout the industry, including most recently at our draft determinations industry seminar on 9 July 2008, we acknowledge that for the price signals and incentive effects to work, as much transparency and simplicity as possible in the structure of charges is required. Simplicity must, of course, be offset against the need to allocate costs to those that cause them so as not to discriminate and to incentivise efficient decisions to be made. We want train operators, funders and others who make decisions about choice of rolling stock and use of the network to pay their fair share of costs and also to face real price signals on the basis of the damage they impose on the network. In this way, over time, the best possible economic use of the network should be made (subject to other non-price related decisions) and the overall cost burden should be reduced. One obvious example of this is if one operator chooses to use a heavier, faster vehicle it is reasonable to expect it to pay higher charges because of the greater damage that this vehicle will do to the network.

18.15 There are limits to the ability of charges to influence franchised passenger train operators. The specifications of franchises and the 'no net loss, no net gain provisions' in franchise agreements (the clause 18.1/schedule 9 provisions) means that franchise operators pay the track access charges in place at the time of their original franchise bid, with the government funding increases to charges during the term of the franchise (or benefiting from reductions). However, charges can impact on the decisions of the manufacturers, rolling stock leasing companies and funders; and where franchised operators have commercial freedom we believe that the charges do promote efficient behaviour.

18.16 Some price signals do affect train operators directly. This is demonstrated by the extensive work carried out by the industry on the traction electricity charge because the level of the indexed change is borne directly by the franchised passenger train operators. In addition, many of the price signals can move along the supply chain to rolling stock leasing companies (RoSCOs) and vehicle manufacturers who can, and do, consider the costs imposed by the operation of vehicles on the network. Funders (governments and regional bodies) can also consider the cost impact of their decisions on the franchise specification and when considering increases or reductions to train services.

18.17 Freight operators and non-franchised passenger operators will face the impacts of changes we make to access charges directly and the level of charges therefore plays a significant role in their decision making, e.g. about the level of service to run and the type of vehicles to use. These signals also pass along the supply chain to train manufacturers and others.

18.18 As we discuss further in chapter 22, during PR08 we have examined and consulted on the introduction of a reservation or scarcity charge and an environmental charge. We decided that it was not appropriate to introduce these charges at the current time. Whilst there are some notable improvements to the structure of charges the changes made in PR08 can be characterised as incremental improvements rather than radical changes.

Charging objectives

18.19 We have developed our charging objectives since PR2000, including during the structure of costs and charges review in 2005 (SOCC review 2005) and through consultation on the structure of charges as part of PR08. Our charging objectives are:

- to promote the objectives of our duties under section 4 of the Railways Act 1993 and be consistent with the wider objectives of funders;
- incentivise Network Rail, train operators, train manufacturers, rolling stock companies (RoSCOs) and funders to ensure the efficient utilisation and development of the network and the optimisation of whole industry costs;
- not discriminate between users of the network;
- be practical, cost effective, comprehensible and objective in operation;
- be consistent with relevant legislation, including the EU Directive 2001/14/EC;
- reflect the efficient costs caused by use of the infrastructure (both to Network Rail or otherwise); and
- ensure that charges enable Network Rail to recover but not to over recover, its allowed revenue requirement.

Developing the charges for CP4

18.20 In 2006 we gave Network Rail responsibility for leading the work to develop proposals for the majority of access charges for CP4, which would be subject to our review and approval (we have continued to lead on examining possible new charges). In particular, we wanted Network Rail to take responsibility for all the core technical work to understand cost variability and to propose charges to us that are consistent with our charging objectives. The broad division of responsibilities between Network Rail and ourselves is set out in figure 18.1.

- 18.21 The changes in responsibilities are intended to encourage Network Rail to have a greater degree of 'ownership' of access charges and build on its improving cost knowledge following its work to develop its infrastructure cost model (ICM).
- 18.22 When we announced our intention in 2006 to give Network Rail greater responsibility there was some concern expressed by the industry that the company would not dedicate sufficient attention to this issue. With two years experience, we believe that there are elements of the new arrangements that have worked well and others not so well. Recently there have been some specific instances where the company has not provided us with the information we require or consulted the industry in a timely way.¹¹⁵ Once PR08 has finished we will review the arrangements with Network Rail and the industry and consider how the process can be improved.

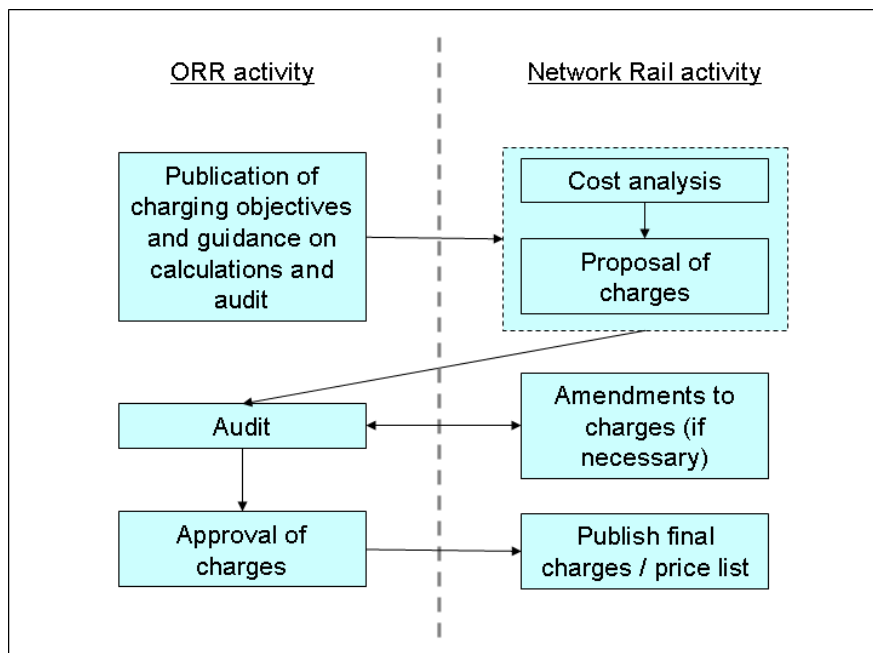


Figure 18.1: Responsibilities for calculating and determining access charges

Price lists and charge schedules

- 18.23 Following publication of our draft determinations, we published on our website detailed price lists and schedules of charges consistent with the draft determinations. We are not including detailed price lists in this document and neither will we be publishing price lists following it as Network Rail will be doing this. This document sets out, where applicable, the total charge levels

¹¹⁵ On 29 August 2008 we wrote to Network Rail to highlight the importance of it completing its outstanding work from the draft determinations. The letter may be accessed at www.rail-reg.gov.uk/upload/pdf/pr08-cons_SOCC_2PP_010908.pdf.

by category of charge. Following the new process for PR08, Network Rail will calculate the detailed charges / schedules of charges over the next few weeks. These charges will be audited by the independent reporter and are subject to our approval. The final price lists and schedules of charges will be published on 18 December 2008 alongside the review notices.

19. Track access charges

Introduction

- 19.1 This chapter sets out the levels for the track access charges we are determining for CP4. (The station long term charge both for stations managed by Network Rail and franchised stations is covered in chapter 21.)
- 19.2 We are determining track access charges payable by franchised passenger train operators, open access passenger and freight train operators.
- 19.3 The chapter is structured as follows:
- background to our assessment of Network Rail's track access charge proposals and the development of the CP4 structure of charges is provided;
 - the levels and calculation for each of the variable track access charges are set out:
 - variable usage charge (including the treatment of coal spillage from freight wagons and discounts for freight wagon suspension types);
 - electrification asset usage charge;
 - traction electricity charge;
 - capacity charge;
 - the levels and calculation of the new charge to recover freight specific fixed costs on freight only lines are set out; and
 - the levels and calculation of the fixed track access charge payable by franchised passenger operators are set out.
- 19.4 In each section we discuss key issues raised by stakeholders as appropriate.

Assessment of Network Rail's charge proposals

- 19.5 Network Rail's proposals for its charges must adhere to our charging objectives and take account of our charging guidelines, which we set out in our June 2006 consultation document on the structure of charges.¹¹⁶ These proposals are then subject to our audit and approval. As part of its SBP, Network Rail set out its proposed indicative track and station access charges, including price lists for the variable usage charge (for both passenger and

¹¹⁶ *Structure of track access and station long term charges*, Office of Rail Regulation, June 2006. This may be accessed at www.rail-reg.gov.uk/upload/pdf/291.pdf.

freight) and part of the price list for the traction electricity charge. In addition, Network Rail carried out an industry consultation on its indicative charges and held an industry workshop on 29 November 2007. Following our review, summarised in our update on the framework for setting outputs and access charges and SBP assessment in February 2008, Network Rail provided a revised set of proposals in its SBP update.

- 19.6 We reviewed Network Rail's updated proposals to inform our draft determinations, aided by the independent reporters (who also assisted us in our review of the company's SBP charge proposals). We generally welcome Network Rail's charge proposals and the large amount of work that has gone into them, although there have been delays in completing some parts of its work in time for our determination.
- 19.7 We commissioned a short study by the Institute for Transport Studies (ITS) at the University of Leeds to examine the overall structure of charges, and review some specific issues in order to inform our assessment.¹¹⁷ ITS found that the overall charges package represents a step forward in providing incentives to industry parties. ITS also considers that the charges could be made more cost reflective, e.g. through the adoption of a simple scarcity charge or the recovery of environmental costs. We have already rejected these options for CP4 but ITS's work provides useful information for further consideration of these issues during CP4. (We summarise our further proposed work in CP4 on charges in chapter 22.) Notably, ITS expressed surprise at the low level of costs deemed variable with usage identified in the SBP, particularly compared to European comparators. ITS also said that it considered route based variable usage charges would be more cost reflective but that any such change should take account of the administrative burden of implementation.

Variable usage costs and charges

Overview

- 19.8 The variable usage charge is designed to recover Network Rail's operating, maintenance and renewals costs that vary with traffic; in economic terms this reflects the short run incremental cost. This means that the charge does not reflect the costs of providing or changing the capability or capacity of the network. These costs are captured by the fixed charge or specific charges for enhancements.¹¹⁸

¹¹⁷ The ITS review may be accessed at www.rail-reg.gov.uk/upload/pdf/cnslt-ITS_rev-NR_charg-props.pdf.

¹¹⁸ More detail on the short run incremental cost basis for the variable usage charge is set out in our June 2006 structure of charges consultation. Further detail can also be found in the initial consultation and emerging views documents of our structure of costs and charges review: *Structure of costs and charges review: initial consultation document*, Office of Rail Regulation, November 2004. This may be accessed at www.rail-reg.gov.uk/upload/pdf/213.pdf; and *Structure of costs and charges review: emerging*

- 19.9 The current charges were derived in PR2000 through a top down assessment of the variability of cost with traffic by asset type. This was then allocated between each vehicle operating on the network based on engineering relationships that identified the cost drivers in terms of vertical forces on the network. The various documentation associated with the derivation of the variable usage charges at PR2000 is available on our website.^{119,120}
- 19.10 Network Rail's approach for calculating the variable usage charge for CP4, set out in its SBP and its SBP update, is based on a range of relationships in the company's ICM about the causation of maintenance and renewals costs on the network due to traffic (only changes in maintenance and renewals costs with changes in traffic are deemed to be material). The approach the company has used to calculate the variable usage charge is based on two runs of the ICM, one at CP4 base traffic levels and a second one with a 5% higher traffic level. Table 19.1 shows Network Rail's projections of total income from variable usage charges in CP4, at its projected end of CP3 efficiency levels.

views on key issues, Office of Rail Regulation, April 2005. This may be accessed at www.rail-reg.gov.uk/upload/pdf/229.pdf.

¹¹⁹ Links to all PR2000 documentation may be accessed at www.rail-reg.gov.uk/server/show/nav.00100a003004001.

¹²⁰ For freight, the charges were established in the review of freight charging policy 2001 (FCR01), using the methodology developed in PR2000. However, allocation was between different vehicle and commodity type combinations, to take account of the differing average speeds involved with the carriage of different commodities in the same vehicle type.

Table 19.1: Projections of total income to Network Rail from its proposed CP4 variable usage charges (at end of CP3 efficiency levels)

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total |
|--------------------------------------|---------|---------|---------|---------|---------|-------|
| GB | | | | | | |
| Franchised passenger | 153 | 154 | 158 | 159 | 159 | 784 |
| Freight | 75 | 75 | 76 | 77 | 80 | 382 |
| Open access passenger ¹²¹ | 6 | 6 | 6 | 6 | 6 | 28 |
| England & Wales | | | | | | |
| Franchised Passenger | 141 | 143 | 146 | 147 | 147 | 724 |
| Freight | 66 | 66 | 68 | 69 | 71 | 340 |
| Open access passenger | 6 | 6 | 6 | 6 | 6 | 28 |
| Scotland | | | | | | |
| Franchised Passenger | 12 | 12 | 12 | 12 | 12 | 60 |
| Freight | 8 | 8 | 8 | 8 | 9 | 42 |
| Open access passenger | 0 | 0 | 0 | 0 | 0 | 0 |

Our assessment of Network Rail's proposals

19.11 We have reviewed Network Rail's proposals on the variable usage charge both in relation to its SBP and its SBP update. This included:

- examining the use of the ICM in calculating cost variability;
- understanding the impact of the choice of 5% increments in traffic to establish the cost variability; and
- reviewing the new methodology developed by Network Rail with its consultant's TTCl to reflect the impact of lateral and longitudinal forces when allocating the charge between vehicle types.

19.12 As part of this assessment, the independent reporter, Halcrow, carried out a review of Network Rail's proposed variable usage charges. Halcrow's first report, which assessed the charges proposals Network Rail included with its

¹²¹ Network Rail has confirmed that around 30% of income from open access operators is variable usage charge income.

SBP, was completed alongside our assessment of Network Rail's SBP and published on our website in February 2008.¹²² Following the SBP update, Halcrow reviewed Network Rail's responses to the issues raised and recommendations made in its first report.¹²³

19.13 In its SBP update Network Rail addressed the majority of the outstanding issues identified by Halcrow. Overall, we consider that Network Rail's (pre efficient) variable cost proposals are a reasonable basis for establishing variable usage charges for CP4. Our determination confirms our draft determinations in this aspect.

Cost variability with small changes in traffic

19.14 Table 19.2 shows the levels of cost variability by activity and asset type given by Network Rail's variable usage charge proposals compared to the levels of variability in the current charges.

Table 19.2: Variability by activity assumed in current and proposed CP4 variable usage charges

| Asset/activity | Current variable usage charges | Basis for CP4 charges (based on Network Rail's SBP update proposals) |
|--------------------------------|--------------------------------|--|
| Track – maintenance | 30% | 29% |
| Track – plain line renewals | 36% | 23% |
| Track – S&C renewals | 25% | 17% |
| Signalling – maintenance | 5% | 5% |
| Civils – metallic underbridges | 10% | 8% |
| Civils - embankments | | 5% |

19.15 Many of the asset/activity combinations show a similar level of cost variability in Network Rail's new methodology compared to the existing approach. However there is a significant reduction in variability for track renewals. A main area of focus in our and Halcrow's review has therefore been the significant decrease in track renewals variability for both plain line and for switches and crossings. This has a material impact on the level of expenditure deemed variable and there is a significant apparent change in the

¹²² *Reporter mandate – variable usage charges, final report*, Halcrow Group, February 2008. This can be accessed on our website at www.rail-reg.gov.uk/upload/pdf/cnslt-var_usg_cost_halcrow.pdf.

¹²³ *Reporter mandate – Update to variable usage costs, Final report*, Halcrow Group, June 2008. This can be accessed on our website at www.rail-reg.gov.uk/upload/pdf/pr08-halcrowvuc-200507.pdf.

understanding of cost variability between the modelled approach (using the ICM) and the expert judgement based approach used in the current charges. To some extent the differences may simply reflect the different approach used now compared to PR2000. The current basis for the charge was an informed assessment by asset specialists at Railtrack, whereas the new approach, using the ICM, should provide a more accurate and reliable value, being based on a set of modelled relationships between costs and activities.

- 19.16 Network Rail reviewed this issue as part of its work between its SBP and SBP update. Halcrow reviewed Network Rail's work and considered that the changes Network Rail made and the reasons provided were satisfactory. We consider therefore that Network Rail's estimate of cost variability is reasonable. We accept that further improvements in the ICM will need to take place during CP4 to inform future reviews of the variable usage charge. Our determination confirms our draft determinations on this issue.

Applying efficiency

- 19.17 In our guidance to Network Rail on preparing its charges we said that we expected its variable usage charge to be set to recover variable usage costs based on the long run efficient steady state cost.¹²⁴ An efficient steady state cost is one that excludes current inefficiency due to catch-up efficiency or backlog expenditure. This approach provides a (more) stable variable charge set at the competitive level. Set at the efficient level, charges on this basis avoid pricing traffic off the network that can afford to pay the efficient cost for access.¹²⁵ In addition to this, it minimises distortions in inter-modal choices. This approach to charging was supported by the majority of stakeholders when we consulted on it during our structure of costs and charges review in 2004 and 2005, and in PR08. We recognise that by setting variable usage charges at levels lower than Network Rail's current variable usage costs Network Rail is not financially incentivised to accommodate additional traffic through the variable charge alone (above the levels assumed for the SBP/SBP update). However, we are also providing Network Rail with a revised volume incentive in CP4 (see chapter 27) which provides it with a direct financial benefit for accommodating additional traffic (over the demand levels assumed in the SBP/SBP update). For this additional traffic the volume incentive would more than offset any shortfall in income if the variable usage charge is set at current levels of efficiency. Moreover, this approach to charging should provide Network Rail with an additional spur to improve its efficiency.
- 19.18 Network Rail has applied its view on long run efficiency to its charging proposals. However, as we have set out in chapter 8 we consider that the level of catch-up efficiency that Network Rail faces is significantly higher than it has proposed. We have therefore adjusted Network Rail's calculation.

¹²⁴ See paragraph 4.20 of our June 2006 document.

¹²⁵ This is the level that would be expected if Network Rail was at or closer to the efficiency frontier.

Instead of Network Rail's efficiency value, we have applied an efficiency adjustment of 34%, which reflects our assumption of the total level of maintenance and renewals efficiency improvement in CP4 and the further catch-up efficiency we have currently estimated for CP5. Table 19.3 shows the total variable usage charge calculated with our efficiency adjustment.

Table 19.3 Comparison of Network Rail's and our calculation of efficient variable usage charges

| £m (2006-07 prices) | Category | 2009- 10 | 2010- 11 | 2011- 12 | 2012- 13 | 2013- 14 | Total |
|----------------------------|---|-------------|-------------|-------------|-------------|-------------|-------|
| GB | | | | | | | |
| Network Rail's proposal | Franchised passenger | 153 | 154 | 158 | 159 | 159 | 784 |
| | Freight | 75 | 75 | 76 | 77 | 80 | 382 |
| | Open access passenger (estimate) | 6 | 6 | 6 | 6 | 6 | 28 |
| Our determination | Franchised passenger | 117 | 118 | 121 | 121 | 122 | 599 |
| | Freight | 57 | 57 | 58 | 59 | 61 | 292 |
| | Open access passenger (estimate) | 4 | 4 | 4 | 4 | 4 | 22 |
| England & Wales | | | | | | | |
| Network Rail's proposal | Franchised passenger | 141 | 143 | 146 | 147 | 147 | 724 |
| | Freight | 66 | 66 | 68 | 69 | 71 | 340 |
| | Open access passenger (estimate) | 6 | 6 | 6 | 6 | 6 | 28 |
| Our determination | Franchised passenger | 108 | 109 | 112 | 112 | 113 | 553 |
| | Freight | 50 | 51 | 52 | 53 | 54 | 260 |
| | Open access passenger (estimate) | 4 | 4 | 4 | 4 | 4 | 22 |
| Scotland | | | | | | | |

| | | | | | | | |
|-------------------------|----------------------------------|----|----|----|----|----|----|
| Network Rail's proposal | Franchised passenger | 12 | 12 | 12 | 12 | 12 | 60 |
| | Freight | 8 | 8 | 8 | 8 | 9 | 42 |
| | Open access passenger (estimate) | 0 | 0 | 0 | 0 | 0 | 0 |
| Our determination | Franchised passenger | 9 | 9 | 9 | 9 | 9 | 46 |
| | Freight | 7 | 6 | 6 | 6 | 7 | 33 |
| | Open access passenger (estimate) | 0 | 0 | 0 | 0 | 0 | 0 |

Open access passenger operators

19.19 Open access passenger operators will pay the variable usage charge derived from the same price list as franchised passenger operators.

Responses to our draft determinations and our determination on the variable usage charge

19.20 In its response to our draft determinations, Network Rail questioned the application of our long-run efficiency assessment to the variable usage charge. For the reasons outlined above we believe that it is important that the variable usage charge reflects our assessment of the long run efficient cost. Our determination therefore confirms our draft determinations in this area.

Allocation between vehicles

19.21 Once the overall efficient level of variable usage cost is identified, it is then allocated between freight and passenger traffic and between individual vehicle types. This allocation reflects the relative damage that each individual vehicle type is estimated to cause to the network, based on the weight, speed and unsprung mass of the vehicle. It therefore reflects the assumed maintenance and renewals costs that Network Rail will incur due to the vehicle's operation. These characteristics reflect the costs associated with vertical forces and as set out below the costs related to lateral and longitudinal forces will now also be factored into the allocation.

19.22 The current charges are allocated between vehicle types based on engineering models of the costs caused through forces applied to the infrastructure vertically. For freight, loaded and empty wagons are specifically distinguished in the model and therefore have separate prices. The passenger vehicle characteristics currently used are:

- **weight:** it is assumed that vehicles are 100% loaded at 80kg per seat (inter-city) and 70 kg per seat (non inter-city);
- **speed:** distance based average speed is used, generally derived from the maximum speed possible by the vehicle (regardless of infrastructure limitations); and
- **unsprung mass** (in the primary suspension).

19.23 Network Rail's proposals for allocating the variable usage charges between different vehicle types in CP4 includes, for the first time, consideration of the impact of lateral and longitudinal forces on the network in addition to the costs through vertical forces. This means adding another term to the charging model in addition to weight, speed and unsprung mass.

19.24 Much work has been carried out across the GB rail industry to understand the impact of lateral and longitudinal forces over the last few years. TTCI undertook some initial work for us in our SOCC review in 2005 and were commissioned by Network Rail to examine relevant, robust and accurate lateral cost drivers to include in the charging model for allocating between vehicles to support its proposals for PR08.¹²⁶

19.25 Network Rail has consulted industry stakeholders on the approach through technical workshops as well as in submissions forming part of its SBP and SBP update.

19.26 Overall, we acknowledge the good work carried out by Network Rail to develop the charging methodology to include lateral and longitudinal forces. We have reviewed the company's proposals and the supporting evidence provided by TTCI. We consider that it is a robust and practical approach and agree with the proposals to incorporate this into the methodology used to allocate the variable usage charge by vehicle type.

Vehicle rates – responses to our draft determinations

19.27 ATOC and HSBC Rail raised issues about the variable usage charge which focused on specific vehicle rates. We hosted a meeting on 30 September 2008 at which Network Rail discussed with ATOC and HSBC Rail these issues, which for CP4 focused on the application of the new lateral/longitudinal forces in the vehicle allocation and how this applied to specific vehicles. The meeting also looked forward to look at the technical work needed over CP4 to develop even more robust charges in CP5. On

¹²⁶ TTCI report available at:

Methodology:

[www.networkrail.co.uk/browse%20documents/StrategicBusinessPlan/Update/TTCI%20\(UK\)%20variable%20charges%20methodology.pdf](http://www.networkrail.co.uk/browse%20documents/StrategicBusinessPlan/Update/TTCI%20(UK)%20variable%20charges%20methodology.pdf)

User guide:

[www.networkrail.co.uk/browse%20documents/StrategicBusinessPlan/Update/TTCI%20\(UK\)%20user%20guide%20for%20variable%20charges%20model.pdf](http://www.networkrail.co.uk/browse%20documents/StrategicBusinessPlan/Update/TTCI%20(UK)%20user%20guide%20for%20variable%20charges%20model.pdf)

some of the material issues raised, Network Rail has written separately to HSBC Rail following discussion with its consultants TTCl.

- 19.28 Network Rail is also checking a number of issues with some specific freight vehicles raised by EWS. It will be reviewing this ahead of its calculations of the final price lists/schedules of charges so that these correctly reflect our determination.

Route-based costs and charges

- 19.29 The current variable usage charge is calculated as a network average. That is, it takes no account of differences in variable costs, on different route types or between areas with different funders, i.e. England & Wales and Scotland. In our PR08 charges guidance we asked Network Rail to provide calculations of route-based costs based on geography and route type, so that we could consider the case for introducing route-based charges.
- 19.30 Network Rail's initial route based costings were presented in its SBP and discussed at its post SBP industry workshop. The calculations showed significant differences across the network, with, in particular, primary routes having significantly lower variable costs (expressed in unit terms, i.e. per tonne) than rural and freight only lines. This is due to primary routes generally having a higher proportion of costs that do not vary with traffic and because of higher relative usage than other route types.
- 19.31 Partly because of the make-up of routes in Scotland this also led to a substantial difference in network average cost between Scotland and England & Wales. In our update on the framework for setting access charges and SBP assessment in February 2008 we said that we would implement separate route-based variable usage charge price lists for England & Wales and Scotland, in order to reflect the differential in costs but also to recognise the separate responsibilities for funding and setting the strategy for the railway between England & Wales and Scotland. We said, however, that our final decision would be subject to final review of Network Rail's route-based costs and consideration of the relative difference between England & Wales and Scotland. The SBP update benefited from further work in this area and led Network Rail to set out route-based costs that differed significantly from the SBP. In particular, the difference between network average variable costs in England & Wales, and Scotland fell considerably.
- 19.32 In the light of these revisions to Network Rail's understanding of route-based costs between England & Wales and Scotland, we decided in our draft determinations not to implement separate variable usage charge price lists for CP4. Given that the cost differential was much less than initially thought it made the case for introduction insufficiently compelling. This received general support from consultees. Our determination confirms our draft determinations in this area.
- 19.33 We will give further consideration to the calculation of route-based costs in CP4 alongside further consideration for route based charging.

Suspension band discounts and penalties

19.34 Since the review of freight charging policy 2001 (FCR01), the variable usage charges for freight vehicles have been modified to reflect the vehicle suspension or bogie type. The aim of this was to provide a discount for those vehicles using 'track friendly' bogies – and hence an incentive for their use. In FCR01 we established the current table of discounts (shown in table 19.4). While this reflected the understanding of track friendly bogie characteristics at the time, and has influenced development and implementation of track friendly bogies by manufacturers and train operators, it is based on qualitative rather than quantitative evidence, with the band being based on an example bogie type rather than quantifying the force effects required to get into a particular band. The force effect here is an approximation to the impact of the vehicle with the particular suspension type on Network Rail's costs. One of the improvements we hoped would be available in this review was evidence to support quantitative boundaries of these force effects between the bands and mid points within the bands. This is important to influence suspension type design because it removes the ambiguity present in the current table as to which band a new suspension type should be in and how much improvement one needs to get into the next band.

Table 19.4: Current suspension bands and associated discounts

| Wagon types | Impact on variable usage charge rate |
|---|---|
| 4-wheel wagon with pedestal type suspension | +9.8% |
| 4-wheel wagon having leaf springs, friction damped | +5.8% |
| Bogie wagon with three piece bogie | +1.8% |
| Bogie wagon with enhanced three piece bogie e.g. "swing motion", and parabolic 4-wheel wagon | -2.2% |
| Basic bogie wagon with primary springs, e.g. Y25 | -6.2% |
| Bogie wagon with enhanced primary springs – low track force bogies, TF25, "axle motion" (like HV primary sprung bogies) | -10.2% |
| Bogie wagon with enhanced primary springs and steering | - 14.2% |

19.35 We were disappointed that Network Rail did not include a proposed new set of discounts as part of its charges proposal put to us before the draft determinations.

Responses and further work

19.36 This was one of the aspects of access charges that Network Rail said it would take forward after the draft determinations, and would complete in time for these determinations. Network Rail eventually published a consultation

proposal on 15 September 2008, very late in the process, and well after the planned date of end July. It did not propose quantitative boundaries between the bandings (or mid points) as we expected and set out in our guidance, our draft determinations and in subsequent discussion with Network Rail. Network Rail explained that this was the result of the research carried out. Network Rail's proposal was for a new suspension band table (shown in table 19.5) based on its work with its consultants Manchester Metropolitan University.

Table 19.5: Suspension banding table as included in Network Rail's consultation document, 15 September 2008

| Suspension band | Wagon Type description | | Suspension factor |
|-----------------|---|--|-------------------|
| 1 | 2-axle wagon with pedestal type suspension | | 1.10 |
| 2 | 2-axle wagon having leaf springs, friction damped | | 1.06 |
| 3 | Bogie wagon with '3-piece' bogie | | 1.02 |
| 4 | Bogie wagon with enhanced '3-piece' bogie; e.g. 'swing motion' or parabolic sprung 2-axle wagon | | 0.98 |
| 5 | 5a | Bogie wagon with coil springs and friction damped suspension e.g. Y25 | 0.94 |
| | 5b | Bogie wagon with coil springs and optimised friction damped suspension | 0.92 |
| 6 | 6a | Bogie wagon with coil springs and viscous damped suspension e.g. TF25 | 0.90 |
| | 6b | Bogie wagon with coil springs and optimised viscous damped suspension | 0.88 |
| 7 | Bogie wagon with enhanced primary suspension system e.g. novel design which significantly exceeds current 6b. | | 0.86 |

19.37 A number of respondents to Network Rail's September 2008 consultation raised concerns about the proposal, particularly:

- the timescales available for review and comments;
- the absence of clear quantified mid and boundary points for each band; and
- the proposed introduction of a differential between friction damped and viscose damped bogie types; this, the key element of Network Rail's proposal would have significant effects if applied either to current or new suspension types and focuses on the design characteristic rather than the force effect or, through this, the impact on Network Rail's cost.

Our determination on suspension banding

- 19.38 Having reviewed Network Rail's proposal and given consideration to the consultees' responses it is clear to us that further work is required before any changes to the suspension banding can be justified. Our determination is therefore to continue with the current suspension banding arrangements for existing vehicles operating on the network for the whole of CP4.
- 19.39 Network Rail will need to work quickly to produce a revised banding that can be used as a criteria for deciding the appropriate level of discount that should apply to new suspension types as these are designed through CP4. There is need for timely production of this so that it does not hold up the manufacturing process of new suspension types. Following full industry consultation and our approval, this new table can then be used for assessing new suspension types as they are developed during CP4. We expect (unless there are justified reasons for not doing this) the proposal to include:
- a quantitative measure of the mid point of each band;
 - a quantitative measure of the boundary between each band; and
 - consideration of whether it is appropriate to introduce lateral and longitudinal effects into the suspension banding table.
- 19.40 We consider that the incentive driven by the suspension band penalty/discount table is particularly important as this has had, and we expect to continue to have, strong incentive effects on the design and manufacture of suspension types. However, we consider that it can only do this with clear quantified evidence of the output effect needed to qualify for each band. We believe that any form of system based on descriptions/identities of types of current suspension banding would continue the limitations experienced in using the current approach. We expect that the final table will be output based. This means the bogie types qualify for the band based on the force they imply on the network and therefore the relative costs to Network Rail rather than the proposal which locks bogies into particular bands because of their description e.g. friction damped suspension necessarily worse than viscous damped suspension. We also continue to believe that the boundaries between bandings need to be quantified. At the industry workshop held by Network Rail on 3 October 2008 this conclusion was supported but it was also agreed that despite the concerns at the specifics of Network Rail's proposal, the work done by Network Rail and its consultants Manchester Metropolitan University would be a useful step in the process of developing this revised table. Network Rail has agreed to plan the necessary further work.
- 19.41 This determination also recognises the long term investments made by operators and manufacturers in current suspension types. Once Network Rail has developed a new approach that is sufficiently robust, hopefully early in CP4, investors in existing vehicles will be informed of the likely application of the banding to all vehicles from CP5.

19.42 Network Rail's price lists for audit will include the impact of the current suspension bands in the variable usage charges.

Coal spillage

19.43 To take account of the cost impact of spilt coal on Network Rail's additional maintenance and renewal costs, a 20% uplift is currently applied to variable charges for vehicles carrying coal. This charge was introduced in FCR01.¹²⁷ In our freight charges consultation document in 2006 we said that we would not expect the coal spillage factor to remain in its current form for CP4 without robust evidence of the impact on maintenance and renewal costs.¹²⁸ In its SBP Network Rail estimated a cost of £7m per annum and described five options for dealing with these costs, with its preferred option being to retain the existing 20% mark-up on the variable charge (which would recover around £5m per annum). Network Rail proposed a rebate for customers who could demonstrate taking steps to minimise spillage. Following concerns expressed by both freight operators and us about the robustness of Network Rail's cost estimates, Halcrow, the independent reporter, was engaged to review the company's estimates and provide an assessment of the costs of coal spillage. Halcrow has estimated a total cost of £4.1m from¹²⁹:

- clean-up and delay costs of point failures;
- preventative work at points that fail repeatedly;
- reduced service life of switches and crossings affected by coal spillage; and
- reduced service life for plain line track affected by coal spillage.

19.44 In response to the SBP update EWS raised a number of concerns on the reporter's costs calculations. The reporter rejected these concerns.¹³⁰

19.45 In our draft determinations we stated that we were content that the reporter's estimate of £4.1m per annum represented a reasonable estimate of the costs of coal spillage. However we were concerned that the unit costs used to estimate the impact of coal spillage were from 2006-07. Consistent with our charging policy, this charge should reflect long-term steady state efficient costs. We therefore adjusted the reporter's cost estimates to reflect long-term steady state costs (that is end of CP4 efficiency and further catch-up in CP5). This reduced the Halcrow estimate by 42% to £2.4m per annum.

¹²⁷ *Review of freight charging policy*, Office of the Rail Regulator, October 2001. This may be accessed at www.rail-reg.gov.uk/upload/pdf/136-fchargfincon.pdf.

¹²⁸ *Consultation on caps for freight track access charges*, Office of Rail Regulation, December 2006. This may be accessed at www.rail-reg.gov.uk/upload/pdf/310.pdf.

¹²⁹ *Reporter mandate, coal spillage costs report*, Halcrow, April 2008. This may be accessed at www.rail-reg.gov.uk/upload/pdf/pr08-halcrowcoal-020608.pdf.

¹³⁰ EWS's concerns are summarised in our draft determinations (at paragraph 19.49).

- 19.46 The costs of coal spillage depend in large part on the volume of coal transported. Following discussions with Network Rail and consideration of the responses by consultees to the SBP, we determined that the charge should be levied as a 'per gross tonne mile' mark-up on the variable usage charge.
- 19.47 In our draft determinations we welcomed Network Rail's proposal to introduce a rebate for customers who take measures to mitigate coal spillage. We asked Network Rail to provide its recommended approach for the rebate as part of its response to our draft determinations.

Responses to our draft determinations and further work

- 19.48 There was broad support from the freight industry for the reduction in the charge following the review by the reporters and the application of our efficiency overlay, although EWS did express disappointment that we did not accept the concerns that they had previously raised. Network Rail welcomed our proposal to levy the charge on a gross tonne mile basis, although it raised concerns over the application of an efficiency overlay.
- 19.49 Network Rail submitted to us its proposals for a discount on the coal spillage charge on 30 September 2008. Its proposed discount is based on monitoring the number of points failures due to coal spillage compared to a base of 2007-08. In addition Network Rail will establish a fund, initially of £250,000, for investment in equipment to reduce coal spillage. This would be funded by an additional separate mark-up on the variable usage charge. Coal loading terminals would seek money from this fund for equipment to reduce spillage, the use and performance of which would be monitored (through using sampling trays). The maintenance and operation of any equipment would rest with the loading terminal.
- 19.50 The industry generally supported Network Rail's proposal to calculate the coal spillage charge discount based on the number of points failures. Network Rail's proposals for an investment fund are based on a pan-industry proposal, although the industry had wanted Network Rail to finance this fund and Network Rail considers that, consistent with the polluter pays principle, it should be financed through a mark-up on access charges.

Our determination

- 19.51 We welcome Network Rail's proposals for a discount and the introduction of an industry investment fund, particularly in terms of the support that the proposed approach has from the industry. Given this we consider that the proposed approach should be implemented.
- 19.52 We continue to consider that Halcrow has provided a reasonable estimate of the costs of coal spillage. Based on this, Network Rail should levy a coal spillage charge of 23.3 pence per 1000 gross tonne miles for 2009-10. At the end of each year we consider that, based on the change in number of points failures due to coal spillage compared to the baseline of 2007-08, Network Rail, in consultation with freight operators, should propose to us a

change to the level of the coal spillage charge. The proposal should include any supporting evidence such as audit by the reporters and any comments from FOCs. If we consider it appropriate we will approve the proposed change to the coal spillage charge and issue a notice to Network Rail and FOCs informing them of this. Irrespective of the number of points failures we do not consider that the level of the coal spillage charge should increase above 23.3 pence per gross tonne mile (2006-07 prices).

- 19.53 We also welcome Network Rail's proposals for an industry fund and agree with Network Rail that this should be financed through a mark-up on track access charges. We consider that the fund should enable coal spillage to be reduced and a discount to be applied to the charge. We consider that a separate charge of 2.2 pence per 1000 gross tonne miles should be levied on all coal traffic in 2009-10. This should create a fund of around £250,000 for 2009-10 (in 2009-10 prices). While we consider that Network Rail should manage the fund it is important that FOCs and other industry stakeholders are consulted when allocating money. Given that there is uncertainty around the number of loading points where funding may be sought we consider that after the end of each financial year Network Rail, in consultation with freight operators, should make a proposal to us on the size and whether to continue with the fund for the following year. If we consider it appropriate we will then decide whether it is appropriate for any balance to be carried forward and whether the charge should continue to be paid and if so at what level.
- 19.54 The process for the discount and investment fund will be included in the changes to be made to schedule 7 and we have shared drafting for comment with affected parties.

Electrification asset usage charge

- 19.55 In the current structure of charges, a mark-up on the traction electricity charges is included to reflect Network Rail's variable maintenance and renewals costs of electrification assets, e.g. overhead lines. In its charges proposal Network Rail, consistent with our guidance, proposed to change this arrangement so that the charge is based on the same principles as the variable usage charge. This involves:
- no longer measuring the charge as a mark-up on the traction electricity charge;
 - estimating the likely element of electrification costs that vary with small changes to the number of rail services operating on the network, based on:
 - use of Network Rail's ICM; and
 - expert judgement.
- 19.56 The proposed new variable electrification asset usage charge recognises that there is a relationship between these costs and train mileage rather than with the amount of traction electricity used. Network Rail has also proposed

separate charges for trains operating on DC ("third-rail") routes compared to OLE routes, reflecting the different level of cost causation.

19.57 We have reviewed the basis of Network Rail's cost estimate and consider that the company's proposal is a reasonable basis for the CP4 charge. For our determination we have applied our long-term efficiency assumption. Table 19.6 shows the expected level of income to Network Rail from the electrification asset usage charge (including our long run efficiency assumption).

Table 19.6: Expected level of income from the CP4 electrification asset usage charge

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total |
|----------------------------|---------|---------|---------|---------|---------|-------|
| GB | | | | | | |
| Franchised passenger | 7 | 7 | 7 | 7 | 7 | 35 |
| Freight | 0 | 0 | 0 | 0 | 0 | 0 |
| England & Wales | | | | | | |
| Franchised passenger | 6 | 6 | 6 | 7 | 7 | 33 |
| Freight | 0 | 0 | 0 | 0 | 0 | 0 |
| Scotland | | | | | | |
| Franchised passenger | 0.5 | 0.5 | 0.5 | 1 | 1 | 3 |
| Freight | 0 | 0 | 0 | 0 | 0 | 0 |

Note: Although indicated as zero a small amount will be recovered by freight

19.58 The charge will be paid by operators running electrified vehicles as a mark-up on the variable usage charge rate on a pence per electrified vehicle mile (and equivalent for freight). This is not included in the current variable usage charge price list. The rates are shown in table 19.7.

Table 19.7: Our determination of the electrification asset usage charge for CP4

| | DC | OLE |
|------------------------|------|------|
| Pence per vehicle mile | 0.39 | 1.02 |

Traction electricity costs and charges

Overview

19.59 Network Rail buys the electricity that is then passed on to train operators to power their electrified train services. Train operators pay the traction electricity

charge to cover Network Rail's costs. The traction electricity charge level for a specific service is dependent on the:

- price of electricity;
- rate at which electricity is consumed; and
- the electrified vehicle miles operated.

19.60 Work took place in CP3 to update the way the price element of the traction electricity charge is calculated for franchised passenger operators. Since April 2007, under the new arrangements agreed with Network Rail, franchised passenger train operators have faced prices set at the actual costs to Network Rail associated with the preferred electricity purchasing strategy decided by the franchised passenger operators as a whole group. This replaced the use of the moderately large users section of the index of average electricity prices (MLUI) published by the Department for Business, Enterprise and Regulatory Reform (BERR) (formerly the Department for Trade and Industry), which was used to rebase the charges each year from the price list originally established at PR2000.

19.61 Table 19.8 shows the best available estimate for the Network Rail income for CP4 from traction electricity charges. There is significant uncertainty in the movement of energy prices and hence this can impact the actual income level. If Network Rail's actual expenditure changes (due to changes in the price) then under the new charging arrangements, this will be reflected directly in the charge levels.

Table 19.8: Estimated traction electricity charge income for CP4

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total |
|----------------------------|---------|---------|---------|---------|---------|-------|
| GB | | | | | | |
| Franchised passenger | 166 | 169 | 175 | 183 | 187 | 879 |
| Freight | 4 | 5 | 5 | 6 | 6 | 26 |
| England & Wales | | | | | | |
| Franchised passenger | 156 | 158 | 164 | 171 | 175 | 825 |
| Freight | 4 | 4 | 5 | 5 | 5 | 23 |
| Scotland | | | | | | |
| Franchised passenger | 10 | 10 | 11 | 11 | 12 | 54 |
| Freight | 0 | 0 | 0 | 1 | 1 | 2 |

Price

- 19.62 When the April 2007 change was agreed between franchised passenger operators and Network Rail, it was thought to be a possible stepping stone to a more sophisticated arrangement that could be employed for CP4, where individual, or smaller groups of, franchised passenger operators (rather than acting as a whole) could negotiate prices separately. This would recognise that different franchisees might have different attitudes towards the risk related to the price of electricity. We consider that it is appropriate for the pricing arrangements for CP4 to allow franchised passenger operators to negotiate prices either in smaller groups or individually as long as the total purchase is higher than the minimum quantity needed to trigger an individual purchase in Network Rail's contract with its energy supplier.
- 19.63 Network Rail has developed with train operators a price matrix that:
- extends the number of traction electricity regions (referred to as electricity supply traction areas (ESTAs) in Network Rail's SBP and SBP update) from nine to 22; and
 - updates the price matrix to reflect Network Rail's current understanding of costs broken down by time of year and time of day (though without including the recent and perceived transitory increases between the SBP and SBP update). This indicative price list was published in our draft determinations price list document.
- 19.64 Freight operators decided not to take part in the changes to the pricing arrangements from April 2007. The traction electricity charge for freight is therefore still based on the equivalent costs in 1999-00 but indexed by MLUI. Concerns have been raised about the reliability of the index, due to a declining sample size and changes in the use of different forms of energy. In a recent consultation, BERR stated that only the 'non-large' size-bands are affected by this, therefore the 'large' size-bands (including MLUI) remain robust.¹³¹

Responses and our determination on price

- 19.65 The draft determinations provided a price list for traction electricity charges. However, passenger operators no longer use a price list in this way (as explained above) and freight operators have said that rebasing and continuing with the current index would involve an element of double counting.
- 19.66 Freight operators have also indicated that they would like to have the ability to discontinue the use of the MLUI index and move to an approach equivalent to the one now used by franchise passenger operators. This is in case they perceive (individually or as a whole) that the MLUI is no longer a sufficient

¹³¹ *Consultation on the sourcing of industrial energy pricing data in the Quarterly Energy Prices publication*, Department for Business, Enterprise and Regulatory Reform, May 2008. This may be accessed at www.berr.gov.uk/consultations/page14043.html.

reflection of actual costs and/or would lead to more accurate costs and charges. The charge would reflect Network Rail actual costs, with the operators being able to influence the timing and duration of purchase. This follows a change in the contractual arrangements between Network Rail and its electricity supplier, which removes the need for a minimum size of consumption before being able to enter into such an arrangement.

- 19.67 Our determination will allow individual franchised passenger operators to purchase electricity at Network Rail's actual cost on the same basis now used by franchised passenger operators as a whole.
- 19.68 Our determinations for the price to be paid by freight operators for traction electricity charges will retain the use of MLUI but without rebasing to current cost so as not to double count some movements in the index. This would arise because of the lagged structure of MLUI. In practice assuming MLUI continues to be a reasonable approximation for Network Rail's costs, the rebasing is not necessary, as the continued use of the index should provide the appropriate level of charge. However, we will also provide a one-off option for each freight operator to move from this to arrangements akin to those used by franchised passenger operators. These could be triggered at the start of any financial year during CP4 but once made no return to the MLUI approach will be possible. The detailed drafting for this will be shared with freight operators and Network Rail for review shortly after the publication of these determinations.

Consumption

- 19.69 Ideally each train operator's electricity consumption would be calculated using on-train metering and there would be no need to estimate electricity use other than to determine an appropriate share of system losses.¹³² Many in the industry are working hard to make this happen and we support this to exploit the benefits of accurate traction electricity billing and because on-train meters would provide a stronger incentive to energy efficient driving policy.
- 19.70 The current arrangements for franchised passenger operators, which involve billing vehicles according to modelled consumption rates and then each train operator facing wash-up adjustments for the difference between actual and modelled consumption, will however continue in CP4 even if on-train metering starts to be introduced across vehicle types.
- 19.71 The accuracy of any individual train operator's modelled consumption rates in a traction electricity region affects, through the wash-up arrangements, the total bill payable by all in that region. The wash-up adjustment currently applies to franchised passenger operators only. The wash-up has always been part of the charging arrangements and adjusts each train operators' traction electricity charge for the difference, in each region, between the total

¹³² Electricity supply losses are an inevitable by-product of the use of electricity. Even with full metering, an "efficient" level of losses would need to be allocated between train operators.

modelled electricity consumption and the actual total electricity consumption, on the basis of each operators' relative share of total modelled consumption, so that Network Rail can recover all of its traction electricity costs. Franchised passenger operators have, since the agreed change to the basis for traction electricity prices from April 2007 faced an additional adjustment in the wash-up for the difference between expected costs and actual costs to Network Rail. This is so that where Network Rail needs to buy additional electricity (over and above that specifically ordered by the train operators) at the cost at the time, it still recovers these costs from the train operators benefiting from the electricity.

19.72 We said in our update on the framework for setting outputs and access charges and SBP assessment in February 2008 that it is important that the modelled consumption rates are as accurate as possible, until such time as there is widespread use of on-train meters. This includes the:

- modelled consumption rates used by each passenger vehicle type or vehicle/route combination:
- consumption by freight operators;
- consumption during stabling; and
- consumption for non-national rail traction purposes, e.g. the power supply to the Waterloo and City line.

19.73 As part of its charges proposal, Network Rail committed to develop a new model to produce rates for use in estimating the consumption of particular vehicles and vehicle/route combinations. It proposed to use this model to produce new consumption rates for application to all vehicle/ route combinations necessary for the start of CP4. The 'TRATIM' model that was previously used to produce the consumption rates is no longer in use. We were disappointed that Network Rail was unable to produce revised consumption rates from its new model in its SBP update. Network Rail has continued work on the development of a new model using Railsys. This has produced a full set of consumption rates for passenger and freight operators, which Network Rail has subsequently consulted upon (see below). We understand the basis for the TRATIM rates and Railsys rates to be different (the former based on simulations of perfect performance, the latter more reflective of average electricity consumption) and that this difference means that it is difficult for rates derived from the models to be consistent with each other across vehicle types and/or route combinations.

19.74 Due to variations in the wash-up, freight operators were excluded from the wash-up adjustment between actual and modelled consumption at the end of each year, determined as part of FCR01. Instead provisions were made for an annual review of the consumption rates to provide for maximum accuracy. In the event the provisions included were not fully used (which also include our role to approve the rates each year). As part of the PR08 work, Network Rail and passenger train operators proposed that there are two possible changes to the current regime:

- freight operators' traction electricity charges are subject to the wash-up adjustment in the relevant traction electricity regions; or
- freight operators should install on-train meters.

19.75 Although we encourage the use of on-train meters we do not consider that it is appropriate to require only freight operators to install on-train meters for this purpose alone. While freight operators' consumption is generally a small proportion of the total, in some regions we understand that the consumption is a significant proportion of the total. We recognise that if freight operators have to pay the wash-up they will face increased cashflow uncertainty if the actual freight consumption differs significantly from the projected freight consumption. However, if they remain outside the wash-up and Network Rail underestimate their use of electricity the resulting cost falls to franchised passenger operators. This highlights the importance of developing accurate consumption rates and also for the wider implementation of on-train meters in the future.

19.76 Our draft determinations said that freight operators (and if applicable open access passenger operators) should be included within the wash-up adjustment.

Responses and our determination on consumption rates

19.77 When using modelled consumption rates to estimate traction electricity consumption by services of different train operators a wash-up is inevitable. This wash-up reflects all the differences between modelled use and actual use from different driver practices, infrastructure conditions etc. It also contains losses of energy from the network which is inherent in the operation of trains.

19.78 In the work following the draft determinations, Network Rail developed and consulted on its new model for modelling traction electricity consumption rates. This model uses an established performance modelling tool called Railsys. With any new model, consultations tend to raise a number of concerns and given that this work happened after the draft determinations it placed pressure on Network Rail to take account of the issues raised by consultees (which was to be expected given the proposal was to change the consumption rates for all vehicle and route combinations), and to refine the model and satisfy us on its robustness.

19.79 Freight operators were broadly comfortable with the use of the new model once they had chance to discuss it in detail with Network Rail and compare with the current rates. The new rates are based on a significantly more accurate methodology than the current freight consumption rates. Some passenger operators and ATOC continue to have material concerns with the use of Railsys. The passenger consumption rates were last reviewed as part of the SOCC review 2005. While some amendments were identified at that time, in general the rates were found to be reasonably accurate.

- 19.80 Freight operators opposed the inclusion of freight services in the wash-up. They did not welcome the risk attached or the cost of bureaucracy involved (particularly with the increase in the number of traction electricity regions). It appeared to them that the change was for completeness and that their electricity use was at a de-minimis level. We met with freight operators, Network Rail and ATOC on 13 September 2008 to discuss the inclusion of freight operators in the wash-up. It was recognised that the reason behind our draft determinations was not completeness but rather the interrelationship between the accuracy of freight and passenger operators' bills. Any inaccuracy in Network Rail's estimation of freight consumption produces risk that is shared out between passenger operators in that region. In some regions (particularly with the increase in number of regions and corresponding reduction in size of region), freight operators' consumption is material and this might become increasingly the case as some passenger operators fit meters and move out of the wash-up arrangements. Annual reviews of consumption rates do not provide a full solution, as they cannot take into account variations in actual consumption e.g. based on different driving approaches. We will encourage Network Rail to share previous wash-up data with freight operators to assist them prepare for inclusion in the wash-up. We confirm our determinations are that freight operators should be included in the wash-up.
- 19.81 Network Rail and train operators are working to identify whether any solutions can be found to reduce further the uncertainty associated with the wash-up (and make each train operators' bill as accurate as possible in terms of electricity consumed). This work is not dependent on the PR08 process and deadlines as any corrections do not require changes to track access contracts. Possible solutions include more regional metering and/or more accurate measurement of the use of electricity while vehicles are stabled. We are supportive of work done in these areas so that the traction electricity charges reflect more accurately the actual consumption rates. We would welcome any improvement in terms of reduced uncertainty associated with the wash-up and would like to be appraised of any major changes.
- 19.82 We have decided that there remain too many concerns at this point to implement the new consumption rates model for all vehicles from the start of CP4. There was always a risk, when Network Rail carried out this important work late in the process, that the industry would not have time to be sufficiently confident in the new modelled rates. Our view is that because of the timescales involved and in the absence of a thorough analysis of the comparisons between current and proposed passenger consumption rates it is not possible to be comfortable that the replacement of the old rates with the proposed rates would improve the accuracy either overall (affecting the wash-up) or relatively between vehicles. The current consumption rates will therefore continue to apply for CP4. Network Rail must however develop a way to produce modelled consumption rates for new vehicles (and potentially existing vehicles where particular concerns arise) during CP4. Network Rail will need to ensure that the principles underpinning the rates for new vehicles are consistent with the principles underpinning the current rates developed through TRATIM. This work needs to start immediately so there is no delay in

deriving a reliable consumption rate for a new vehicle type or a vehicle type on a new route. Unfortunately, this also makes it difficult to be confident in applying the new freight consumption rates produced using Railsys because of the inconsistencies between freight and passenger vehicles modelled consumption rates that would affect the accuracy of both categories bills. Therefore we do not propose to implement the new modelled consumption rates for current freight vehicles.

Regenerative braking and on-train metering

19.83 When the infrastructure supports the use of regenerative braking and the rail vehicle will allow it, savings can be made in the overall energy requirement, thereby improving environmental performance and reducing Network Rail's costs. In CP2 and CP3 we have provided for a potential discount to the small minority of rail vehicles using regenerative braking applied at a single rate of 16.5% of the traction electricity charge (excluding the electrification asset usage element of the charge) where the facility was available and being used.

19.84 In practice, the actual savings available from regenerative braking vary, depending, among other things, on the nature of the electrification infrastructure (overhead line AC or third rail DC systems) and the service frequency. Network Rail has done further work on the appropriate level of the discount and has reflected these in its charges proposals, which are shown in table 19.9.

Table 19.9: Network Rail's proposed CP4 regenerative braking discounts

| Type of infrastructure/service frequency | CP4 discount |
|--|--------------|
| AC, long distance (more than 10 miles between stations) | 16% |
| AC, regional and outer suburban (less than or equal to 10 miles between stations) | 18% |
| AC, Local and commuter (less than or equal to 2.1 miles between stations) | 20% |
| DC, Southern region Central ESTA | 15% |
| Rest of DC | 5% |

Source: Network Rail SBP update.

19.85 These results were broadly consistent with the work we had carried out in the SOCC review 2005. In the legal drafting for schedule 7 we published for consultation on 18 July 2008, we included a process by which someone wishing to use on-train metering for the first time during CP4 could agree the arrangements with Network Rail.

Responses and our determination on regenerative braking and on-train metering

19.86 As highlighted in DfT's response to the draft determinations and acknowledged in Network Rail's response, new evidence has been identified on the DC network other than the central ESTA/region. This suggests that the whole DC region is capable of savings of around 15%. Network Rail suggests that the rates should be left unchanged and dealt with on a case-by-case basis.

19.87 We have reviewed the new evidence on the regenerative braking discount in the DC area and consider that it is reasonable and should be applied as the default from the start of CP4. Therefore we do not agree with Network Rail that its proposed 5% discount level should be retained as a default for the non-central ESTAs in the DC system and reviewed on a case-by-case basis. If metered evidence shows a particular service is making more or less savings then the train operator or Network Rail will be able to propose an amendment for that service. This applies anywhere on the network. Table 19.10 below therefore shows our revised decisions on regenerative braking discounts.

Table 19.10: Revised regenerative braking discounts following new evidence

| Type of infrastructure/service frequency | CP4 discount |
|--|--------------|
| AC, long distance (more than 10 miles between stations) | 16% |
| AC, regional and outer suburban (less than or equal to 10 miles between stations) | 18% |
| AC, Local and commuter (less than or equal to 2.1 miles between stations) | 20% |
| DC | 15% |

19.88 In CP4, evidence from on-train metering can assist with identifying a more accurate discount for the use of regenerative braking. We have also determined that the traction electricity charging provisions in track access contracts will allow for the addition of on-train metering to vehicles prior to or during CP4. Network Rail is still developing the detail on what it considers is necessary for on-train metering to be used. Initial issues raised include:

- being consistent with the required British Standards;
- not used for any other purpose;
- fitted and sealed by OFGEM approved operators;¹³³
- used all the time (with estimated consumption rates used if there are gaps in the data collection); and
- how system electricity losses are allocated.

¹³³ Office of Gas and Electricity Markets.

- 19.89 We want train operators to receive benefits from fitting on-train meters and while we clearly need to ensure required standards for meters it is important to achieve the correct balance between generating reliable data and minimising the costs involved. We encourage train operators, RoSCOs and manufacturers to work with Network Rail on the issues set out above.
- 19.90 Responses from a number of passenger operators and ATOC emphasised the need to be able to use on train metering directly, rather than have a process in the track access contract to negotiate the arrangements as and when needed.
- 19.91 We remain of the view that use of on-train metering and growth of such use over CP4 is positive not just in improving the accuracy of traction electricity charge bills but enabling train operators to manage energy efficient improvements with more certainty about the benefits that can be received. We have agreed that Network Rail can commit an element of its safety and environment plan rolled-over from CP3 to CP4 for work in this area.
- 19.92 We expect that an operator being billed via an on-train meter would pay based on the metered consumption and not be subject to the wash-up process. This is a clear benefit to all who introduce on-train metering in that it at least improves the accuracy of traction electricity charge bills. However, some losses of electricity from the system should be allocated over and above that metered amount. Recent work has shown that losses from the system are at a higher level than previously understood (as much as 14 or 15%). This increases the importance of understanding how the losses should be shared across operators who fit meters and the general wash up and the incentive on Network Rail to reduce the system losses.
- 19.93 Our determination is to introduce arrangements broadly as at our draft determinations that enable provisions for charging for on-train metering to be added in the track access contract at the start of each year from 1 April 2010 by which time rules to be included in the network code can be agreed upon. The basis for such charging would need to be metered consumption plus some fraction of system losses. We are aware that ATOC and Network Rail have done further work on legal drafting in the very recent past and have yet to be able to review this. We will examine how we can improve the drafting we consulted on in the 18 July Schedule 7 consultation and will re-issue in the next couple of weeks for further comment. Neither our approach nor that proposed by franchised passenger operators requires the use of on-train meters and therefore while a matter for government, the application of 18.1/Schedule 9 franchise arrangements does not appear to be affected.

Capacity charges

- 19.94 The capacity charge was introduced as part of the periodic review 2000 (PR2000) (although the implementation of the charge was delayed by a year for franchised passenger train operators and introduced for freight operators as part of the conclusions of the review of freight charging policy, October 2001). However, prior to this, the same costs were recovered either as part of

the fixed track access charge or through negotiation when train operators made changes to services.

- 19.95 The capacity charge recovers additional schedule 8 (performance regime) costs of additional traffic on the network. These costs arise because as the network becomes more crowded it becomes more difficult for Network Rail to recover from incidents of lateness. These costs differ across the network and at different times as the capacity utilisation and the proximity of train services differs.
- 19.96 Since PR2000, the charge has not been able to be billed to reflect these different costs by region and timeband as initially envisaged. Instead at ACR03, we agreed to formalise an arrangement for franchised passenger operators that recovered the charge by averaging the data by region and timeband into an average rate per service group. Similar arrangements were applied to freight operators. This simplified form of the charge still allows Network Rail to recover its cost on average but it significantly reduces the incentive effects of the charge.
- 19.97 Network Rail's SBP proposal was to revert to a capacity charge that differed by strategic route section (bi-directionally) (614 different sections) and by six timebands (including differential charges for weekend services). This would have been a less complex arrangement than the original PR2000 charge but would be more cost reflective than the current charge. Network Rail also proposed to update the relationship between capacity utilisation (reflected in the capacity utilisation index (CUI)) and reactionary delay (the types of delay most affected by changes in train operations on the network) used to calculate the charge. In response to Network Rail's consultation a number of fundamental issues were raised by stakeholders about the capacity charge and particularly its interaction with the performance regimes (passenger and freight). These arguments particularly focused on the:
- unintended partial double recovery of the same costs through the capacity charge and the freight performance regime;
 - the impact of the performance regime benchmark recalibrations for CP4 on the level of capacity charge; and
 - the change in circumstances between early CP2 (when the charge was introduced) and the start of CP4 where increasing capacity constraints and tighter franchise specifications may limit the ability to alter services and reduce the incentive effects of the capacity charge.
- 19.98 In response to this, Network Rail carried out extensive work to examine and clarify the relationship between the capacity charge and the schedule 8 performance regimes for passenger and freight operators. Network Rail accepts that it can only easily address some of these anomalies in CP4 and that the issues will need to be considered further before the next periodic review. Network Rail said in its SBP update proposal that in its view these

anomalies support an argument for retaining the more simplified current arrangements for the capacity charge.

19.99 Through changes to the freight performance regime, we will limit the anomalies identified in the interaction with the capacity charge for CP4. We are adjusting the freight performance regime so that freight operators benchmark performance changes to reflect material growth in overall traffic on the network to minimise any double recovery of these costs with the capacity charge from new services. In our draft determinations we considered that it would be wrong to abolish the capacity charge given that a significant cost remains which would not otherwise be recovered. We will work with Network Rail and industry partners over CP4 to review the remaining outstanding issues.

19.100 Our draft determinations on the capacity charge for CP4 were that it should:

- reflect the impact of the recalibration of schedule 8 and use current schedule 8 payment rates;
- continue in the simplified form but with weekend discounts to reflect better the likely lower costs at that time in most cases;
- while in principle the relationship between the capacity utilisation index (the level of utilisation on the network) and reactionary delay (the types of delay most likely to be found with knock on delays) should be updated from the current 1998-99 level to 2006-07 levels, we accept that consistent with the simplified form for the charge that the 1998-99 relationship can be retained (although the understanding of how this relationship has changed should be part of the review of the capacity charge in CP4); and
- to facilitate, as far as possible, operators or their funders adding new services at appropriate cost levels by the use of weekend discounts and the possible re-definition of service groups (e.g. to reflect purely PTE and services supported by others such as Transport for Wales).

Responses to our draft determinations and further work

19.101 Many responses to the draft determinations were critical of continuing the capacity charge for CP4 given the anomalies that had been identified by Network Rail following its SBP and associated workshop.

19.102 Network Rail consulted the industry on its further methodology in response to our draft determinations on 20 August 2008. In particular it proposed a 25% discount for weekend rates. Network Rail considered other changes to the capacity charge to reflect schedule 8 changes both from the passenger performance regime review 2005 (when passenger operators 'Network Rail' payment rates generally increased) and for the change in the level of expected performance over CP4 (where performance is expected to improve reducing reactionary delay and therefore potentially the capacity charge).

Network Rail found that the proposed level of the capacity charge was sensitive to the proposed changes.

- 19.103 Unlike passenger service groups, the definition of freight service groups used in the capacity charge is based on commodity types. There is not necessarily any relationship between commodity types and the level of costs recovered by the capacity charge. Network Rail has therefore developed an approach to generate a single freight average rate for the capacity charge rather than use the separate service group rates.

Our determination

- 19.104 While we consider that the proposed changes to the performance regime address many of the anomalies identified in the capacity charge, some simplifications will remain. Nevertheless we continue to consider that the capacity charge recovers genuine costs imposed by train operators. In the absence of freight or passenger traffic it would be easier and therefore less expensive for Network Rail to achieve its schedule 8 performance regime benchmarks. These additional costs are not currently recovered from funders. We therefore continue to consider that the capacity charge should remain.
- 19.105 We recognise that the incentive effects of the capacity charge are likely to have been diminished by increasing capacity constraint on the network and tighter franchise specifications which have limited train operators scope to respond to the charge. We therefore consider that the current simplified version of the capacity charge should remain.
- 19.106 We recognise that the level of the capacity charge is sensitive to the underlying assumptions in particular in relation to the performance regime benchmarks and payment rates. We therefore consider after further discussions with Network Rail, that it is not appropriate to reflect some changes (e.g. the increase in passenger performance regime payment rates) and not others (e.g. the update to the relationship between the capacity utilisation index and reactionary delay). We therefore do not consider it appropriate to make a change to the base level of the capacity charge at this time apart from introducing a weekend discount. As there is not necessarily any relationship between freight commodity types and the level of reactionary delay we consider that the distinction between freight commodity types should be removed.
- 19.107 We consider that a review of the capacity charge is needed for CP5. This needs to address all the remaining anomalies in the capacity charge taking into account the impact on incentives.

Table 19.11: Expected CP4 capacity charge income*

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total |
|----------------------------|---------|---------|---------|---------|---------|-------|
| GB | | | | | | |
| Franchised passenger | 148 | 149 | 151 | 152 | 152 | 752 |
| Freight | 4 | 4 | 4 | 4 | 4 | 21 |
| England & Wales | | | | | | |
| Franchised passenger | 144 | 145 | 146 | 147 | 148 | 729 |
| Freight | 4 | 4 | 4 | 4 | 4 | 19 |
| Scotland | | | | | | |
| Franchised passenger | 4 | 4 | 4 | 4 | 4 | 22 |
| Freight | 0.3 | 0.3 | 0.4 | 0.4 | 0.4 | 2 |

Note: *A small amount of additional capacity charge income will be received from open access passenger operators.

Freight only line charges

Overview

- 19.108 The current structure of freight track access charges was established in FCR01.¹³⁴ Under these arrangements freight operators pay a range of variable charges but do not currently contribute to fixed costs (costs that do not vary with small changes in traffic) or common (shared) costs.
- 19.109 In October 2006 we stated our intention to introduce a new charge to recover the fixed costs of freight only lines. The proposed new charge reflects the government's statement in its 2004 white paper that: "Where lines carry only freight, and no passenger services, the freight operators will pay its full costs".¹³⁵ To be consistent with relevant legislation, the full costs of freight only lines can only be charged where the freight market can bear this cost. In our advice to ministers in February 2007, following analysis on the ability to pay of each market segment to bear increases in costs, we concluded that only two market segments had the ability to bear the fixed costs of freight

¹³⁴ *Review of freight charging policy: final conclusions*, Office of the Rail Regulator, October 2001.

This may be accessed at www.rail-reg.gov.uk/upload/pdf/136-fchargfincon.pdf.

¹³⁵ *The Future of Rail*, Department for Transport, July 2004, Cm 6233. This may be accessed at www.dft.gov.uk/about/strategy/whitepapers/rail/thefutureofrailwhitepapercm6233.

only lines, coal for the electricity supply industry (ESI coal) and spent nuclear fuel.¹³⁶

Network Rail's proposals

19.110 In its SBP update Network Rail has proposed annual freight only line charges of £4.58m for ESI coal and £0.81m for spent nuclear fuel. In accordance with the principles set out in our advice to ministers, these charges will be capped in the first year, and levied as a mark-up on the variable charge.¹³⁷ Network Rail's updated charge proposals are a 30% reduction on those contained in the SBP, due to a combination of a revision to freight only line costs and the application of its view of CP4 efficiency. Network Rail's proposals are set out in table 19.12.

Table 19.12: Network Rail's freight only line charge proposals

| '006-07 prices and Network Rail's view of end of CP4 efficiency | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|--|------------|------------|------------|---------|---------|
| ESI coal | | | | | |
| Cap on ESI coal freight only line charge £m | 2.8 | 5.6 | 8.4 | 11.2 | 13.9 |
| Total capped ESI freight only line charge £m (bold is capped charge) | 2.8 | 4.58 | 4.58 | 4.58 | 4.58 |
| ESI coal mark-up in £ per 1000 gross tonne miles | 0.282 | 0.460 | 0.460 | 0.460 | 0.460 |
| Spent nuclear fuel | | | | | |
| Cap on spent nuclear fuel freight only line charge £m | 0.3 | 0.6 | 0.8 | 1.1 | 1.4 |
| Total capped spent nuclear fuel charge £m (bold is capped charge) | 0.3 | 0.6 | 0.8 | 0.81 | 0.81 |
| Spent nuclear fuel mark-up £ per 1000 gross tonne | 1.902 | 3.805 | 5.073 | 5.136 | 5.136 |

¹³⁶ *Advice to ministers and framework for setting access charges*, Office of Rail Regulation, February 2007. This may be accessed at www.rail-reg.gov.uk/upload/pdf/316.pdf.

¹³⁷ Following our advice to ministers, we conducted a further consultation on the form of the new charge. We concluded that it would be applied as a mark-up on the variable usage charge. This is set out in: *Charge to recover the costs of freight only lines*, Office of Rail Regulation, October 2007. This may be accessed at www.rail-reg.gov.uk/upload/pdf/fof-conclusions.pdf.

| 2006-07 prices and Network Rail's view of end of CP4 efficiency | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|---|---------|---------|---------|---------|---------|
| miles | | | | | |

Our draft determinations

19.111 In our draft determinations we welcomed Network Rail's proposals, in particular they reflected our key recommendations following the SBP, namely that:

- renewals unit costs on freight only lines are 80% of the network average (as recommended by the reporter);
- freight only line charges should reflect end of CP4 efficiency only (long run efficiencies are only applied to variable charges); and
- charges should reflect an improved representation of freight only line costs in the ICM.

19.112 We reviewed Network Rail's list of freight only lines. We were satisfied with the list but considered that two additional lines should be added to this list:

- the existing freight only line between Charlestown Junction and Kincardine; and
- the new freight only line between Alloa and Kincardine.

19.113 Both lines are alternative routes to access Longannet power station and as such are terminal freight only lines, meeting our definition for the levying of charges. Including these lines increased ESI coal freight only line costs by £0.57m.

19.114 We reviewed Network Rail's freight only line cost calculations that underpin the above charges. Network Rail identified an error in the calculation of signalling costs for the Drax line. Removing this error reduced ESI coal freight only line charges by £0.11m. The combined effect was to increase ESI coal freight only line costs by £0.46m to £5.04m.

19.115 Network Rail estimated that the average cost of freight only lines is £38,100 per track-km (after adjusting for the error relating to the Drax line and at Network Rail's end of CP4 efficiency). Freight operators repeatedly raised concerns over the level of Network Rail's freight only line cost estimates. In December 2006 EWS provided an alternative estimate of track maintenance and renewal costs of freight only lines of £9,500 per track-km, around half of the equivalent Network Rail estimates. Since then Network Rail has reduced its estimates of freight only line costs considerably, with the average cost per track-km falling by around 40% as shown in figure 19.1. The largest reduction was in signalling and civils expenditure, with only a small reduction in track maintenance and renewal costs.

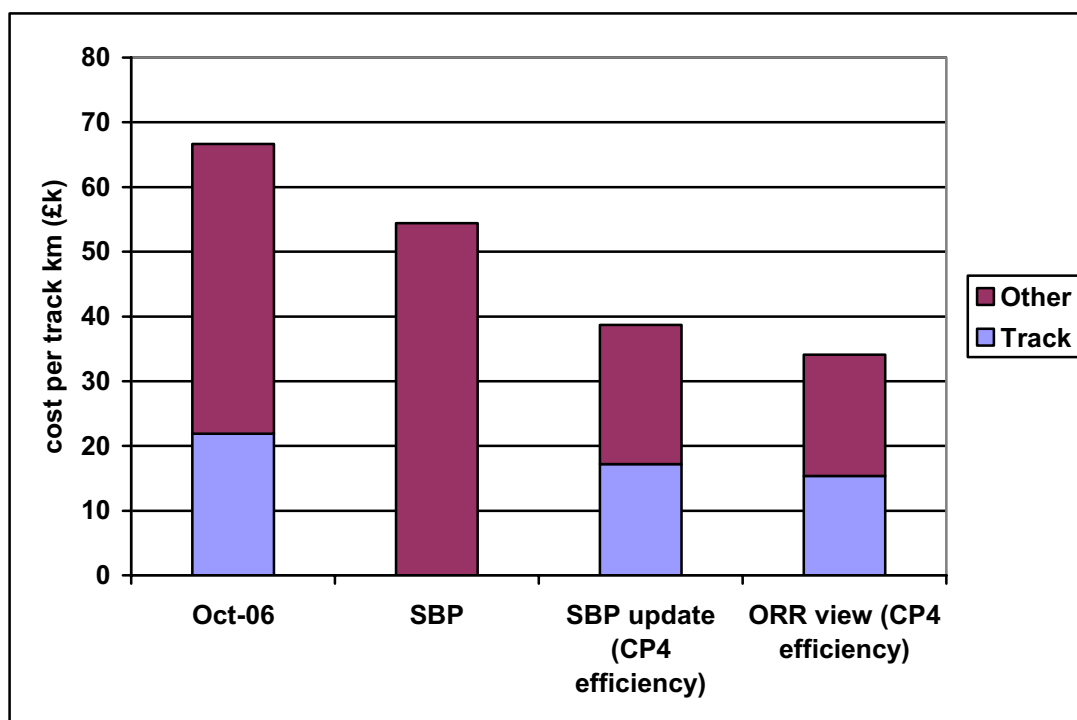


Figure 19.1: Freight only line cost estimates

19.116 In summary we considered that overall, and after overlaying our own efficiency assumptions, Network Rail's freight only line cost estimates were a reasonable basis for setting charges. By the end of CP4 we expected maintenance and renewal costs to have fallen by 22.6% compared to Network Rail's assumption of 13.6% (as set out in chapter 12). This reduced the costs of freight only lines to £34,200 per track-km. The resulting freight only line charges would be £4.52m for ESI coal and £0.73m for spent nuclear fuel.

Consultation responses

19.117 DfT welcomed the reduction in freight only line charges, although EWS continued to express concern over the level of freight only line costs. Freightliner suggested that there are proposals to operate passenger services on the route between Charlestown and Alloa in the future.

Our determination

19.118 We continue to consider that overall, and after applying our efficiency assumptions, Network Rail's freight only line cost estimates are a reasonable basis for setting charges. We are not aware of future passenger services between Kincardine and Alloa however if passenger services do start to operate on freight only lines obviously this could be taken into account when the level of the charge is reviewed during the next periodic review.

19.119 We have corrected an error in our calculations of the spent nuclear fuel mark-up (rather than the total level of the charge itself) and have revised the mark-up accordingly. Our determination of total freight only line charges for CP4 is shown in table 19.13.

Table 19:13: Our determination of total freight only line charges for CP4

| 2006-07 prices and our end of CP4 efficiency | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|--|------------|------------|---------|---------|---------|
| ESI coal | | | | | |
| Cap on ESI coal freight only line charge (£m) | 2.8 | 5.6 | 8.4 | 11.2 | 13.9 |
| Total capped ESI freight only line charge (£m) (bold is capped charge) | 2.8 | 4.52 | 4.52 | 4.52 | 4.52 |
| ESI coal mark-up (£ per 1000 gross tonne miles) | 0.282 | 0.454 | 0.454 | 0.454 | 0.454 |
| Spent nuclear fuel | | | | | |
| Cap on spent nuclear fuel freight only line charge (£m) | 0.3 | 0.6 | 0.8 | 1.1 | 1.4 |
| Total capped spent nuclear fuel charge (£m) (bold is capped charge) | 0.3 | 0.6 | 0.73 | 0.73 | 0.73 |
| Spent nuclear fuel mark-up (£ per 1000 gross tonne miles) | 1.902 | 3.805 | 4.601 | 4.601 | 4.601 |

Summary and comparison of variable charges

19.120 Table 19.14 shows the total passenger variable charges we have determined for CP4, compared with those currently paid by passenger operators. Excluding the capacity charge this shows that passenger operators will on average see variable charges reduce by 36%. The actual impact will vary between vehicle types. The capacity charge is being adjusted to apply to all services, replacing the element formerly recovered through the fixed charge for traffic on the network before 1999-2000 (known as the capacity charge

offset). This means there is an apparent increase in the total passenger capacity charge, although this is offset by a reduction in the fixed charge of the same amount.

Table 19.14: Comparison of current and future variable passenger charges

| £m (2006-07 prices) | Current (rebased to 2009-10 forecast traffic levels) | CP4 determination (2009-10 forecast traffic levels) |
|--|--|---|
| Franchised passenger variable usage charge | 240 | 120 |
| EC4T | 137 | 134 |
| Electrification asset usage charge | 31 | 7 |
| Sub-total | 408 | 261 |
| Capacity charge | 7 | 149 |
| Total | 415 | 410 |

19.121 Table 19.15 shows the total freight charges we have determined for CP4, compared with those currently paid by freight operators. This shows that freight operators will on average see charges reduce by 35%. The actual impact will vary between vehicle type and commodity.

Table 19.15: Comparison of current and future freight charges

| £m (2006-07 prices) | Current (rebased to 2009-10 forecast traffic levels) | CP4 determination (2009-10 forecast traffic levels) |
|---|--|---|
| Freight variable usage charge (excluding coal spillage) | 100 | 58 |
| Coal spillage charge | 5 | 2.4 |
| Capacity charge | 4 | 4 |
| EC4T | 4 | 4 |
| Freight only line charge (ESI coal spent nuclear fuel) | na | 5.3 |
| Total | 113 | 73.7 |

Fixed track access charge

- 19.122 The fixed track access charge recovers Network Rail's residual revenue requirement (often termed the net revenue requirement) after estimating the income from all the variable track access charges, the station long term charge, network grants and the other single till income. The fixed charge is only paid by franchised passenger operators.
- 19.123 The principal purpose of the fixed charges is to allow Network Rail to recover its total expected revenue requirement. However, we consider that the way in which the charge is allocated between franchised passenger train operators is important, and that Network Rail should make the charge as cost reflective as possible, in particular to meet our objective that costs should be recovered from those that cause them.
- 19.124 The current fixed charge allocation is reliant on most costs being allocated at a high level. Out of these, most costs are allocated between franchised passenger operators based on national vehicle mileages with only renewals costs allocated by strategic route (using the 26 strategic route definitions employed at the time).
- 19.125 In our charging guidance to Network Rail we asked it to consider the implications of the work that our consultants AEA Technology Rail (AEAT) had undertaken for us during the 2005 SOCC review. This focused on allocating the fixed charges between franchised passenger operators using the 'avoidable cost' principle. This involved estimating what costs would be avoided if a particular train operator's services were not run.
- 19.126 In its proposals, Network Rail moved some way towards adopting the avoidable cost approach. The company has significantly improved the current approach by increasing the disaggregation of the fixed maintenance and renewals costs. In the case of renewals, costs are now allocated to 307 strategic route sections rather than 26 routes. Currently, network wide maintenance costs are allocated to franchised passenger operators based on timetabled vehicle miles, whilst the new approach will see maintenance costs disaggregated to the 307 strategic route sections. The maintenance and renewals costs for each of the 307 strategic route sections are then allocated between train operators on the basis of timetabled vehicle miles. Although many cost types e.g. British Transport Police costs are still allocated between franchised passenger operators at a national level, Network Rail estimates that the percentage of these common costs compared to the total costs recovered through the fixed charge is around 30%.
- 19.127 Our draft determinations welcomed the improvements that Network Rail has proposed and consider that it is a reasonable basis for allocating the fixed charge in CP4.

*Our determination***Table 19.16: Total fixed track access charge**

| Fixed track access charge £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total |
|---|---------|---------|---------|---------|---------|-------|
| Total | 744 | 782 | 760 | 900 | 1,160 | 4,346 |

19.128 The total fixed track access charges are shown in table 19.16 above in the summary of this document. The allocation of that charge total between operators will follow our determination. This will use Network Rail's allocation model based on 307 strategic route sections for much of the cost data. The enhancement expenditure changes since Network Rail's SBP update are significant so we have asked Network Rail to revise its calculations accordingly to reflect these accurately in the regional allocation. We will audit this as part of the process for the approval of the price lists and schedules of charges.

Effluent charge

19.129 During CP3, Network Rail identified a category of costs relating to the cleaning up of effluent from the track at stations that it believed it did not recover through the charges and funding arrangements established through ACR03. Given the limited level of disaggregation of its cost submission for ACR03, it was not possible for us to be conclusive as to whether Network Rail was or was not funded. However, we agreed with Network Rail that if the costs were excluded from its submissions for CP4, it should recover the costs from train operators using vehicles that did not prevent such spillage, i.e. without the appropriate retention tank technology. The recommendation was that this should be through the stations code arrangements.

19.130 In July 2008, after the publication of our draft determinations, Network Rail and ATOC jointly proposed that, in the absence of the new stations code, this cost should be estimated and recovered through access charges. A joint Network Rail and ATOC consultation document was published on 4 September 2008.

19.131 Network Rail estimated a range of per annum costs to be recovered by the proposed new charge (£4.2m up to £20.4m). It proposed £7.2m as a 'conservative' estimate. Respondents had a wide range of views on the costs involved and many thought that even the lower end of Network Rail's range would involve double counting with costs involved in the final CP4 arrangements. The consultation document recognised that most vehicles were fitted with equipment that prevented effluent spillage and so attempted

to identify a list of the vehicles whose operation could cause these costs to arise. Respondents suggested that a number of these vehicles should be removed from this list and further vehicles should be added.

Our determination

19.132 For a charge to be implemented at this point of the review we, and the industry in the consultation, would have to have accurate information about the level of the charge and the vehicle types where it would apply. We have examined the cost estimates provided by Network Rail and find it difficult, given the late consultation on this issue, to identify reliably the cost levels and to assure ourselves that these costs are not already included in Network Rail's SBP. Moreover we consider that if Network Rail is certain that these costs are excluded from its current funding then it should be able to produce a specific and accurate estimate of the costs rather than a wide range. We therefore consider that Network Rail has not convincingly demonstrated that it would incur additional costs over and above those included in the SBP and that a separate effluent charge should not be levied. If effluent spillage continues to be an issue in CP4 we expect Network Rail and the industry to continue to work to find ways to limit the activity.

20. Network grant

Introduction

20.1 This chapter sets out the level of network grant payments that we will allow Network Rail to receive from DfT and Transport Scotland in CP4 in lieu of fixed track access charges.

Background and approach

20.2 Between publication of the ACR03 final conclusions in December 2003 and the start of CP3 on 1 April 2004, ORR approved changes to the balance of Network Rail's income between network grants and track access charges.¹³⁸ The balance was altered so that a higher share of funding would be paid in network grants than envisaged in the ACR03 final conclusions. A reduction in the level of fixed track access charges was made that was equal to the higher level of network grant payments. The request to alter the level of network grants was made by government and approved by ORR in order to meet government accounting rules, taking into account our section 4 duties and considering Network Rail's key accountabilities to its train operator customers and ORR.

20.3 The government accounting rules say that direct grants paid to Network Rail are accounted for as capital expenditure in the government's accounts, whereas the equivalent money paid as government subsidies to train operating companies (who in turn pay track access charges to Network Rail) are accounted for as resource (current) expenditure. Government accounting rules impose constraints on the level of grants by way of two financial tests:

- **investment test:** this states that network grants that are accounted for as capital expenditure in the government's 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
- **market body test:** this test requires that 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.

¹³⁸ *Access Charges Review 2003: Regulator's Approval of Network Rail's Proposed Financing Arrangements*, Office of the Rail Regulator, 10 March 2004. This may be accessed at www.rail-reg.gov.uk/upload/pdf/188.pdf.

- 20.4 Our preferred method of funding Network Rail is for all of its income to come from train operating companies and other customers. However, we must have regard to the financial position of the Secretary of State and Scottish Ministers when we are conducting an access charges review. The governments have told us that it is not possible to make changes to government accounting rules.¹³⁹
- 20.5 We recognise this issue and, in September 2007, we consulted on our proposal to allow government to continue to pay network grants to Network Rail in CP4 and the approach we should use.¹⁴⁰
- 20.6 In order to determine the level of network grants, we set out in our update on the framework for setting outputs and access charges that we would retain the approach we have used in CP3. That is, the government accounting rules for both the investment and the market body tests will continue to be applied to determine the ex ante level of network grants. We said that we will allow sufficient headroom above the level of network grants to accommodate a prudent level of cost and income fluctuations so that the rules are not breached if outturn income and expenditure are different to those set out in our determination.
- 20.7 In CP3 we have, to date, following our consideration of the government's request, allowed annual adjustments to the level of grant payments. For CP4 we have determined that we will set out the schedule of grant payments that we will allow in our determination and not then allow any adjustments to these during CP4.
- 20.8 Respondents to our September 2007 consultation supported our proposed approach. We confirmed our approach in our update on the framework for setting outputs and access charges and SBP assessment in February 2008.

Grant dilution

- 20.9 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.
- 20.10 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 retain the grant dilution provision in track access contracts for CP4.

¹³⁹ The accounting rules that governments throughout the European Union must adhere to, do not allow grants to the private sector to be accounted for as capital formation, unless paid directly to the private sector entity undertaking the capital formation. Therefore, such grants cannot be routed through the TOCs.

¹⁴⁰ *Periodic Review 2008: Financial issues update and further consultation*, Office of Rail Regulation, 6 September 2007. This may be accessed at www.rail-reg.gov.uk/upload/pdf/pr08-financial-issues-let-060907.pdf.

Schedule of network grant for CP4

- 20.11 Table 20.1 sets out the schedule of allowed grant payments for CP4, calculated on the basis of our determination, using the approach set out above. We have factored in 5% headroom for the market body test but no headroom for the investment test to take account of possible fluctuations in costs or revenues and to take account of the risk and impact of breaching either of the two accounting tests.
- 20.12 In its response to our draft determinations Network Rail questioned the amount of headroom we have factored in to our calculations, suggesting that it may not be sufficient to accommodate variability in income or in costs (for instance due to re-phasing). We met Network Rail (with DfT and Transport Scotland) to discuss this issue and we have undertaken a range of sensitivity tests on our calculations. We are satisfied that under a wide range of plausible income and expenditure scenarios in CP4 that the level of headroom we have established is sufficient to ensure that the market body test should not be breached. If the investment test were to be breached then either government would have to make the relevant adjustment to their accounts.
- 20.13 As discussed in more detail in chapter 28, further to our draft determinations Transport Scotland asked us to reprofile £60m of Network Rail's revenue requirement from the first two years of CP4 into the last three years. We have agreed to reprofiling grant payments. Network Rail will receive the capitalised financing costs from Transport Scotland associated with the deferral.
- 20.14 Table 20.1 shows both the calculation of grant payments without the deferral and our determination of grant payments following the reprofiling.

Table 20.1: Network grant payments in CP4

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total |
|--|--------------|--------------|--------------|--------------|--------------|---------------|
| England & Wales grant payments in CP4 | 3,049 | 3,067 | 3,090 | 3,032 | 2,782 | 15,020 |
| Scotland grant payments (without reprofiling) | 355 | 359 | 351 | 236 | 198 | 1,500 |
| Scotland reprofiling | (25) | (35) | 15 | 20 | 33 | 8 |
| Scotland grant payments in CP4 | 330 | 324 | 366 | 256 | 231 | 1508 |

- 20.15 The grant levels are 63% of Network Rail's gross revenue requirement in England & Wales, and 56% in Scotland.
- 20.16 Although the grant payments represent a significant revenue stream for Network Rail, the company will still receive a large amount of money direct

from train operators. This is an important indicator of Network Rail's primary accountability to its customers.

20.17 Further detail on our calculations of the network grant is provided in annex F.

Deed of grant

20.18 At the date of these determinations Network Rail has not entered into new grant arrangements with either DfT or Transport Scotland for CP4. We expect new deeds of grant, consistent with these determinations and otherwise satisfactory to us, to have been entered into and become effective by the date on which we issue our review notices. We will engage with Network Rail, DfT and Transport Scotland on this issue.

20.19 If new grant arrangements, satisfactory to us, are not in place between Network Rail and DfT/Transport Scotland by this date we will have to include provisions in Schedule 7 of franchised operator track access contracts to ensure that Network Rail's financial position is protected. The precise nature of any such provision will depend upon the circumstances relating to the payment of grant by each government at that time but such provision would need to ensure that Network Rail did not face any shortfall in funding from 1 April 2009. We anticipate that any such provision would provide for an adjustment to be made to fixed charges.

21. Station long term charge

Introduction

- 21.1 This chapter contains our determination for the station long term charges in CP4. Station long term charges are payable by franchised and open access passenger train operators who call at stations.
- 21.2 Consistent with this determination, Network Rail will provide us with the station long term charges for each station (both Network Rail managed and franchised stations) over the next two weeks in advance of the audit process. We set out later in this chapter the aggregate charge for each franchisee station facility owner (SFO)¹⁴¹. This includes the regulated London Underground stations total which Network Rail will need to breakdown between London Underground regulated stations.

Network Rail's proposal

- 21.3 Station access charges (known as the station long term charge) enable Network Rail to recover the costs of maintaining, renewing and repairing the stations it owns. It also enables recovery of some or all of the additional costs where station capability is enhanced.¹⁴² A station long term charge is separately set for each station and is paid by all the train operators who use the station in proportion to the number of train departures at that station.¹⁴³ The current station long term charges were determined in PR2000. Total stations cost estimates and capital values were allocated between different station categories, based on the station's physical characteristics such as number of platforms. Charges are then net of any rental income received.
- 21.4 We consulted on initiating a review of station long term charges in April 2005 as there had been a number of changes to the stations access regime since 2000, not least the development of the stations code, that might benefit from more cost reflective station long term charges.¹⁴⁴ However, we decided not to make changes to the station long term charges at that time and instead we deferred such changes to PR08.

¹⁴¹ A station facility owner is the train operator who manages the station and is normally the main user of the station. It pays the station long term charge to Network Rail and then recovers contributions from other users of the station proportionate to the number of departures.

¹⁴² This includes both managed stations (where Network Rail manages the station) and other stations owned by Network Rail but managed by the station facility owner (SFO), normally the principal train operator at the station.

¹⁴³ The initial liability falls on the SFO at non-Network Rail managed stations.

¹⁴⁴ *The structure of station long term charges*, Office of Rail Regulation, April 2005. This may be accessed at www.rail-reg.gov.uk/upload/pdf/231.pdf.

- 21.5 In preparing its CP4 proposal for station charges, Network Rail gave careful consideration to how the charging structure could facilitate improved joint working between itself and train operators such that there was a shared understanding of the expenditure allocated to stations and how best it could be spent. Network Rail said that the current arrangements were not working because the way that total station expenditure was allocated meant that the individual station charges bore little relation to the level of expenditure at those stations. This created tensions with train operators, particularly those where the charges paid by the train operator exceeded the level of station expenditure. Network Rail therefore concluded that:
- the level of disaggregation at which train operators would value some certainty about Network Rail's planned station expenditure is generally at the level of a franchisee's portfolio of stations rather than for each individual station;
 - all station beneficiaries would value some certainty that Network Rail's stations expenditure would broadly reflect the station long term charges paid over a portfolio of stations; and
 - obtaining greater transparency of stations expenditure through Network Rail's annual return was generally welcomed.
- 21.6 Network Rail therefore proposed that the focus in future should be on expenditure allocated to a 'portfolio' of stations and said that this would be transparent for all operators see. Consistent with this approach, it also proposed that individual station long term charges would be set to zero and costs would be recovered from the relevant SFO through portfolio level charges, included as part of the fixed charge in track access contracts.

Our draft determinations

- 21.7 We carefully reviewed Network Rail's proposals to adopt a portfolio based charge and abolish the individual station long term charges. In our assessment of Network Rail's proposal we discussed with stakeholders, including ATOC, train operators and actual and potential investors at stations. Network Rail's station long term charge proposals were assessed against our charging objectives (set out in chapter 18).
- 21.8 We supported Network Rail's intention to create a structure which enables a more joined up approach to developing station expenditure proposals. We believe that allocating expenditure to portfolios of stations in a transparent way and then discussing with station users (not just the SFO) the best use of that expenditure at individual stations is a very positive step. It would build on the collaborative approach that we have seen work up proposals for the national stations improvement programme.
- 21.9 However, a number of stakeholders were concerned at removing the station long term charge and recovering the equivalent costs through the track access contracts. Reasons put forward included the loss of transparency and/or accountability partly through the removal of the link between the

charge and the contractual rights and procedures (reflected in the station access regime).

- 21.10 Our draft determinations were that the station long term charge should be retained (at a per station level) but that this should be consistent with, and underpin, the proposed changes set out above to move to a more portfolio based approach for expenditure planning. That is, the charges at individual stations within a portfolio add to the total portfolio planned expenditure. No capital value will be recovered through the station long-term charge. The charge would be set to recover the efficient maintenance, repair and renewals costs at stations.
- 21.11 It is important to emphasise that, given Network Rail's intention to work collaboratively with train operators to decide how the portfolio expenditure is allocated to individual stations, it is highly unlikely that individual station charges will ultimately equal individual station expenditure. We believe it would not be helpful for train operators necessarily to link the two.
- 21.12 The basis for Network Rail's portfolio level expenditure proposals is the company's infrastructure cost model. Our draft determinations considered those submitted through the SBP update to be reasonable (further detail on our assessment of operational property is set out in chapter 5).

Consultation responses and further work

- 21.13 Responses to our draft determinations on station long term charges were generally supportive. However, they tended to focus on the new process planned to enable each franchised passenger train operator (and other affected beneficiaries) to influence how Network Rail's maintenance, repair and renewals expenditure will be allocated across a franchisee's group of stations.
- 21.14 Points raised by consultees included situations where:
- a train operator other than the SFO uses only a small part of a station and yet still needs to make its case for expenditure on that part of the station; and
 - operators and Network Rail need to judge appropriate expenditure on stations that might be declining in condition, even while the category average station condition target is being met.
- 21.15 London Underground is SFO at a number of stations. Some of these are former Silverlink stations while others have always been outside the regulated station regime. The regulated London Underground station charges (i.e. those where Silverlink was formerly SFO) were inadvertently left out of the draft determinations price list but will be included in the final price list and sum to the total £1 million per year charge to London Underground as a regulated SFO. The stations outside the regulatory framework remain unaffected by the changes made here although we have discussed with Transport for London and London Underground how they might want to involve those stations in the

work of the joint boards to best address maintenance, renewals and repair expenditure needs across groups of stations.

Franchised stations – proposed re-balancing of charges between franchisee's portfolios

- 21.16 Network Rail has continued to carry out surveys on further stations to update its expenditure estimates in time for this determination. It told us before our draft determinations that this might lead to changes in the balance of expenditure between franchisees' groups of stations but would not alter the total station long term charge. We said that if Network Rail submits material new evidence that the level of charges should be re-balanced (following full industry consultation) by the end of August 2008 then we would consider making changes to the allocation of charges between franchisees. This was mainly to support the new joined up approach for influencing the allocation of expenditure. The closer the station long term charge total for each franchisee is to actual Network Rail planned maintenance, repair and renewal expenditure, the easier it should be for the relevant parties to consider the process for allocating spend.
- 21.17 Network Rail has carried out further work, particularly spending more time assessing the condition of the 1,900 stations it had previously surveyed to inform its estimates. This along with other evidence including the examination of specific case studies has led to a proposal that Network Rail consulted the industry upon on 1 August 2008¹⁴⁵.
- 21.18 All respondents either supported the update or were agnostic but wanted to make other comments on the proposed new approach to station expenditure.
- 21.19 Network Rail also consulted on its proposal on the appropriate station long term charges payable at its 18 managed stations. While during the previous two control periods, the managed stations have had either zero or low charges because, while the charge included a capital element as well as general expenditure, it also netted off retail and rental income. For CP4, Network Rail proposed that for managed stations the station long term charge will reflect only the maintenance, repair and renewals costs in the same way as it does at franchised stations. The only difference in methodology proposed by Network Rail for managed stations is that charges should reflect much longer-term average annual expenditure to avoid peaks in charges associated with large peaks in expenditure at individual stations.
- 21.20 In reviewing the station long term charges that this produces, Network Rail recognised that even taking long term average annual costs spread over the period between CP5 and CP10, there were still specific project peaks being reflected at some stations and not others. It recognised that in practice these

¹⁴⁵ Network Rail: consultation on long term charges, 1 August 2008. This may be accessed at: http://www.networkrail.co.uk/browse_documents/regulatory_documents/access_charges_reviews/consultations_on_future_charging/final_charging_proposals/g-station_long_term_charge_consultation_1_aug_08.pdf

same projects at different stations, e.g. major roof renovations would be comparable in cost but would be completed over a longer time horizon of around 100 years. Network Rail therefore produced the following proposed station long term charges based on very long term expenditure projections.

Table 21.1: Network Rail's proposed station long term charges

| Managed station | Projected annual average expenditure (CP5 – CP24) £m (pre-efficiency) |
|-------------------------|---|
| London Kings Cross | 1.64 |
| London Liverpool Street | 1.72 |
| Fenchurch Street | 0.93 |
| Cannon Street | 0.94 |
| London Bridge | 1.76 |
| London Charing Cross | 0.94 |
| London Waterloo | 1.72 |
| London Victoria | 1.69 |
| London Paddington | 1.46 |
| London Euston | 1.70 |
| Gatwick Airport | 1.01 |
| Birmingham New Street | 1.08 |
| Manchester Piccadilly | 1.34 |
| Liverpool Lime Street | 0.89 |
| Leeds | 1.62 |
| Edinburgh Waverley | 1.38 |
| Glasgow Central | 1.36 |
| St Pancras Midland Road | 0.72 |
| Total | 23.88 |

Our determination

21.21 We have decided that the updates to the station long term charges for franchised stations recommended by Network Rail should be made. The new evidence, based on bottom up plans taking full account of station condition should have considerably improved the robustness of Network Rail's expenditure estimates. The consultation process seems to have been managed well by Network Rail and the greater accuracy of its projections should support the new joined up approach in determining expenditure across a franchisee's portfolio of stations.

- 21.22 We recognise that there is a lot of interest among train operators and other consultees about how this new joined up approach will work in practice. Network Rail and ATOC wrote to the industry on 15 October 2008 setting out details on the integrated stations planning (ISP) initiative. This represents an important milestone in setting up the new arrangements. We will encourage the further development work and monitor the early experiences of the local delivery groups.
- 21.23 Our determination on station charges and our support for the move towards portfolio based expenditure planning does not in any way change Network Rail's output obligations across each category of station (see chapter 4).
- 21.24 Table 21.2 shows our determinations for station long term charge totals by franchisee as SFO. For the audit process in mid November, Network Rail will provide a full station by station list of charges allocating these totals between stations using the same modelled information that it provided to us when we produced the draft determinations price list document.

Table 21.2: Our determinations for station long term charge (franchised stations) totals by franchisee as SFO

| Train operator (station facility owner) £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total |
|--|----------------|----------------|----------------|----------------|----------------|--------------|
| Arriva Trains Wales | 7 | 7 | 7 | 7 | 7 | 35 |
| C2C Rail | 2 | 2 | 2 | 2 | 2 | 10 |
| Chiltern Railways | 3 | 3 | 3 | 3 | 3 | 15 |
| East Midlands Trains | 4 | 4 | 4 | 4 | 4 | 19 |
| First Capital Connect | 5 | 5 | 5 | 5 | 5 | 27 |
| First Great Western | 10 | 10 | 10 | 10 | 10 | 50 |
| First ScotRail | 12 | 12 | 12 | 12 | 12 | 60 |
| First/Keolis TransPennine | 2 | 2 | 2 | 2 | 2 | 10 |

| Train operator (station facility owner) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total |
|--|----------------|----------------|----------------|----------------|----------------|--------------|
| £m (2006-07 prices) | | | | | | |
| Express | | | | | | |
| London Midland Trains | 7 | 7 | 7 | 7 | 7 | 36 |
| London Overground | 1 | 1 | 1 | 1 | 1 | 5 |
| London Underground | 1 | 1 | 1 | 1 | 1 | 5 |
| Merseyrail | 4 | 4 | 4 | 4 | 4 | 21 |
| National Express East Anglia | 9 | 9 | 9 | 9 | 9 | 45 |
| National Express East Coast | 12 | 12 | 12 | 12 | 12 | 12 |
| Northern Rail | 11 | 11 | 11 | 11 | 11 | 56 |
| South Eastern | 12 | 12 | 12 | 12 | 12 | 58 |
| South West Trains | 12 | 12 | 12 | 12 | 12 | 59 |
| Southern | 9 | 9 | 9 | 9 | 9 | 46 |
| West Coast Trains | 5 | 5 | 5 | 5 | 5 | 24 |
| Total | 119 | 119 | 119 | 119 | 119 | 593 |

Note rows and columns do not necessarily sum due to rounding

21.25 We also accept that it is consistent to treat the managed stations in the same way as the franchised stations although charges will reflect much longer term annual average expenditure proposed by Network Rail in order to avoid large peaks in charges at some major stations when there is a large peak in expenditure. While in practice this will mean positive station long term charges at many of the managed stations for the first time (given the removal of the current netting off of rental income), it is consistent with our determination that the station long term charges should reflect Network Rail's efficient maintenance, repair and renewal costs at stations.

21.26 Table 21.3 sets out Network Rail's expected income from station long term charges in CP4.

Table 21.3: Expected income to Network Rail from station long term charges

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total |
|----------------------------|---------|---------|---------|---------|---------|-------|
| Franchised stations | | | | | | |
| GB | 119 | 119 | 119 | 119 | 119 | 593 |
| England & Wales | 107 | 107 | 107 | 107 | 107 | 534 |
| Scotland | 12 | 12 | 12 | 12 | 12 | 60 |
| Managed stations | | | | | | |
| GB | 18 | 18 | 18 | 18 | 18 | 92 |
| England & Wales | 16 | 16 | 16 | 16 | 16 | 82 |
| Scotland | 2 | 2 | 2 | 2 | 2 | 11 |

Note rows and columns do not necessarily sum due to rounding

22. Other charging issues

Introduction

22.1 This chapter addresses a range of other charging issues that have not been covered in chapters 19 - 21. The chapter covers:

- dealing with PTE sponsored increases or reductions to train services;
- new charges considered for CP4 but not being implemented;
- change of law provisions; and
- next steps.

The impact on Network Rail's costs of PTE sponsored increases or reductions to train services

22.2 As part of the work to review the appropriate access charges for CP4, we have been examining how the access charges might facilitate the government's intention, set out in its 'Future of Rail' white paper, that PTEs could make increments and decrements to the level of franchised passenger train services they sponsor, as long as the financial impact of this change is felt by them.¹⁴⁶

22.3 This applies to English passenger transport executives (PTEs) and Transport for London (although in theory the principles could apply more widely).¹⁴⁷ It requires the identification of all the extra costs or cost savings to different industry parties from the change in PTE or TfL sponsored services. In its white paper the government set out its view that we should establish a method of allocating infrastructure costs in support of this policy.

22.4 Such a method is relevant to Network Rail's access charges because where its infrastructure costs change as a result of a PTE/TfL increment or decrement, a change to its access charges provides a way to transfer these cost changes firstly between the train operator and Network Rail but ultimately between the PTE/TfL and Network Rail.

22.5 Our investment framework already sets out the basis for funding enhancements required to accommodate increases in train services so the work in PR08 has focused on the likely cost savings to Network Rail from PTE/TfL sponsored reductions in train services. The issues being:

¹⁴⁶ *The Future of Rail*, Department for Transport, July 2004, Cm 6233. This may be accessed at www.dft.gov.uk/about/strategy/whitepapers/rail/thefutureofrailwhitepapercm6233.

¹⁴⁷ It might potentially be applicable to other local authorities in England & Wales or Scotland at some point in the future.

- identifying where material cost savings are likely to be available if the reduction takes place;
- identifying where material cost savings are unlikely to be available if the reduction takes place;
- recognising that some case by case discussions would inevitably be needed between Network Rail and the PTEs/TfL and providing a forum for them to make those discussions as effective as possible while minimising transaction costs; and
- facilitating the transfer of funds where PTE/TfL sponsored reductions in services do cause material savings in Network Rail's costs.

22.6 While allocating Network Rail's costs in response to PTE/TfL sponsored changes in services does need an element of case by case discussion, by working with Network Rail and PTEs/TfL we have developed a methodology that should meet the aspirations of the white paper.

22.7 In particular, Network Rail has focused on identifying where material savings are and are not likely to be achieved through reductions to train services. The principles identified were:

- material savings are likely where Network Rail will, as a result of the reduction in services, be able to make savings in its maintenance and renewals activity planned for CP4; while
- material savings are unlikely where such savings are not available in the current control period even where longer term activity might be saved; and
- material savings are more likely where the reduction in train services occurs on infrastructure specific to that service rather than on one where many services share the infrastructure.

22.8 In our February 2008 update to the framework for setting access charges, we consulted on whether it would facilitate the case-by case discussion process between Network Rail and the PTEs/TfL, if we were to make additions to the track access contract between Network Rail and the relevant train operator to set out rules for these discussions. For example:

- the level of information to be provided by the PTE;
- maximum timescales for response by Network Rail; and
- arrangements for appeal if necessary.

22.9 Network Rail in particular was concerned that as the PTE/TfL was not directly a party to the track access contract, this was not the appropriate place to set out rules for the discussions between the two organisations.

22.10 We accept this point and will instead prepare and consult on guidelines to this process as a further development of our investment framework. We are

confident that this will provide for an effective process for discussing and identifying the savings available whilst minimising the transaction costs.

- 22.11 Although it is not appropriate to put the above rules in the track access contract, we continue to believe that the transfer of moneys should be through the contract (Part 5 of Schedule 7, as a negative charge where relating to a reduction in train services). This is similar to the way PTEs/TfL support services using the track access contracts.

Rejection of new charges for CP4

- 22.12 Earlier in PR08 we consulted on the possible introduction of scarcity charges, reservation charges and environmental charges. In the June 2006 consultation on the structure of track access and station long term charges, we said we thought that it would be wrong to do further work on the introduction of a scarcity charge at that time given the complexity likely to be involved and because it was important to allow sufficient time for the route utilisation strategies to be developed nationwide. In our policy statement on our sustainable development and environmental duties¹⁴⁸ we stated that 'we do not intend to implement an environmental charge at the start of CP4 or during CP4 unless an equivalent charge is implemented for other transport modes, but we undertook extensive work on the pros and cons of implementing a reservation charge. Following our work and consultation with the industry we said that there was insufficient evidence that a reservation charge would produce net benefits and we would therefore not introduce a reservation charge in CP4.
- 22.13 We will review the potential for all of these charges again during CP4 for possible implementation in CP5. More detail on our work and decision on a reservation charge is provided in our update on the framework for setting outputs and access charges in February 2008.

Effluent charge

- 22.14 One respondent suggested in response to the Network Rail/ATOC joint consultation, that the proposed new effluent charge (see chapter 19), as an environmental charge, could not be introduced as we had already ruled out introducing environmental charges in CP4. However the effluent charge relates not to the external social cost of the environmental impact of rail services but instead relates directly to a cost to Network Rail.

Change of law provisions

- 22.15 Franchised passenger operators' track access contracts contain change of law provisions. In summary these provisions allow Network Rail to recover additional costs from these train operators in the event of a qualifying change of law that increases Network Rail's costs (above that anticipated at the time

¹⁴⁸ Office of Rail Regulation, Sustainable development and environmental duties, April 2007. This may be accessed at www.rail-reg.gov.uk/server/show/ConWebDoc.8651.

of the most recent periodic review) and where we determine that these should be borne by the operator instead of Network Rail.

- 22.16 Our update on the framework for setting outputs and access charges in February 2008 stated that we considered that the change of law provisions in Schedule 7 of track access contracts were no longer necessary as Network Rail could bear the uncertainty within the other protections provided through our determination.
- 22.17 In our April 2008 consultation on changes to the possessions compensation regime we stated that in the light of the proposed changes to the treatment of competent authority possessions we were giving further consideration to whether the change of law provisions should be removed. This consideration was associated with the proposals that compensation for competent authority possessions should be paid through arrangements contained in the network code – leaving it to Network Rail to recover associated costs directly from competent authorities rather than each access party recovering their own costs, as is currently the case. Network Rail would only be obliged to compensate train operators for the effects of disruptive possessions resulting from network change attributable to a competent authority direction or change in law where, and to the extent that, Network Rail recovers compensation from the competent authority or some other governmental body, and then share the compensation recovered amongst the relevant parties. In cases where no compensation is able to be recovered, then losses would lie where they fall.
- 22.18 In April 2008 we considered whether the change of law provisions would provide a mechanism for government to provide funding to Network Rail via franchised TOCs (which have a pass through mechanism in their franchises) for a competent authority network change. We have reviewed the drafting of the change of law provisions and have identified that it specifically excludes compensation related to parts F and G of the network code. Without amendment, the change of law provisions would therefore not provide a mechanism for government to provide competent authority funding to Network Rail.
- 22.19 We therefore confirm that the change of law provisions should be removed from track access contracts.

Scope of 'access charges reviews capable of coming into effect before 1 April 2014'

- 22.20 We consulted on legal drafting for Schedule 7, consistent with our draft determinations, on 18 July 2008. We included in that the exceptional circumstances and adjusted interest cover ratio (AICR) re-openers that describe conditions which allow for access charges reviews that could come into effect before 1 April 2014. These provisions were included in both passenger and freight charging schedules. One freight operator highlighted the uncertainty that this introduced both to actual and prospective freight customers and investors.

- 22.21 We have reviewed our position in the light of these comments and have determined that these re-openers should only be included in franchised passenger operators track access contracts.
- 22.22 Access charge reviews carried out and made effective during a control period for these reasons are exceptional and such reviews are likely to relate to a need to change the overall level of revenue requirement and/or outputs. Franchised passenger train operators have provisions in their franchise contracts that allow such changes to impact directly on funders rather than impacting on the individual train operators. It is also unlikely that the variable track access charges or open access passenger/freight incentive and compensation regimes would be a key issue or priority in such a review.
- 22.23 We recognise that this means that if we were to judge it necessary to change variable track access charges or incentive regimes for franchised passenger operators, this could lead to a temporary disconnect between these and equivalent charges in open access passenger and freight operators contracts. Any decision however on the conclusions of such a review would need to be made balancing our statutory duties and deciding whether it would be appropriate to create such a disconnect. We would also need to consider the legal position at that time.
- 22.24 The general periodic review re-opener that provides for an access charges review that can only be effective from 1 April 2014 remains in franchised passenger, open access passenger and freight operators' track access contracts.

Looking ahead to CP5

- 22.25 We consider that the CP4 access charges decisions mark a generally incremental, but nevertheless important, improvement in the overall structure of charges. For example, we now have:
- greater robustness in estimating the variable usage charges;
 - the inclusion of the cost impact of lateral forces in the allocation of variable usage charges between vehicle types; and
 - more accurate allocation of fixed costs between franchised passenger train operators.
- 22.26 Improving the understanding of cost causation is an ongoing area of work, as is the consideration of changes to the structure of charges to ensure that our charging objectives are met. As we have said above, we will be giving further consideration to environmental, scarcity and reservation charges in CP4, along with further consideration of route based charging.
- 22.27 By the time we come to undertake the next periodic review (which we expect to make a determination during 2013) we would expect significant further development of the infrastructure cost model.

23. Other single till income

Introduction

23.1 This chapter sets out our assessment of Network Rail's likely income from sources other than access charges in CP4. We need to assess the level of this income because it reduces the amount of funding Network Rail will require from access charges.

Background and approach

23.2 Other single till income is dominated by income from property, as shown in table 23.1 which presents Network Rail's forecasts from the SBP. Accordingly property income has been the main focus of our analysis.

Table 23.1: SBP forecast of other single till income in CP4 (Great Britain)

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total |
|--|------------|------------|------------|------------|------------|--------------|
| Property rental | 190 | 188 | 187 | 190 | 187 | 943 |
| Property sales | 26 | 25 | 34 | 18 | 24 | 128 |
| Depots | 46 | 46 | 46 | 46 | 46 | 231 |
| Other | 2 | 2 | 2 | 2 | 2 | 12 |
| Total non charge related income | 265 | 262 | 269 | 257 | 259 | 1,313 |

Rounded to the nearest million.

Property income in the SBP

23.3 Our initial view, published in our assessment of the SBP in February 2008, was that the forecasts for property income were robust overall but appeared to be conservative in two areas:

- the SBP had forecast that rental income from managed station retail units would increase by 0.5-1% per annum, which appeared low given a projected 3% per annum rise in footfall; and
- the SBP forecast of rental income from Network Rail's other property outperformed a weighted average benchmark index (the "IPD" index¹⁴⁹) by 0.5% per annum, which DTZ Piedad said appeared modest.

¹⁴⁹ The IPD index is an industry-standard yardstick of property investment performance.

- 23.4 We also had concerns over the treatment of station development income, with anticipated but uncertain income from developments at Euston and Victoria not included by Network Rail in the SBP calculation of its revenue requirement.

SBP update

- 23.5 Network Rail chose not to update its property forecasts for its SBP update in April 2008. However, in response to the concerns we expressed in our assessment Network Rail provided us with (as part of its SBP update) a confidential document justifying retail income growth assumptions. In this document, Network Rail went some way to justify its forecast growth in retail income, through presenting the historic level of passenger numbers and sales growth and outlining the other factors considered in forecasting rental income.
- 23.6 Network Rail also submitted a letter repeating its proposal that the income from developments at Euston and Victoria stations should not be assumed in determining its revenue requirement for CP4. This letter gave more detail as to the nature and timing of the proposed developments, and the increased risk to them. It argued that the timetable for delivery of benefits is at risk from delay to the consultation and planning consents processes, and that the overall forecast costs and benefits of the schemes are likely to change.
- 23.7 In arriving at our draft determinations we reviewed the assumptions behind Network Rail's property income forecasts and compared the results with recent levels and trends.
- 23.8 Network Rail's property forecasts and the methodology underlying them were reviewed by its own consultants, Lambert Smith Hampton. We asked DTZ Pida to conduct a peer review of this work to obtain an independent view as to the robustness of the assumptions made and resultant forecasts. Our own analysis focussed on comparing the CP4 income forecasts with the level and trend of income during CP3, and reviewing the factors Network Rail assumed would drive income in the future.

Response to our draft determinations

- 23.9 In its response to our draft determinations, Network Rail argued that its April 2008 update forecast was now at risk, and asked its consultants (Lambert Smith Hampton) to reassess their forecast of rental income to take into account the less favourable outlook for the economy as a whole.
- 23.10 Network Rail also reassessed the level of income expected from property sales. Lambert Smith Hampton's advice was that 2008 and 2009 were not the right time to initiate new development schemes, but provided an opportunity for Network Rail to work up plans to coincide with their forecast improvement in the market from 2010. Network Rail's response to this advice was to more than halve income expected from sales in the first two years of CP4 from the level forecast in the SBP update.

- 23.11 Network Rail also restated the argument that its forecast of income from developments at Euston and Victoria stations should be excluded from the revenue requirement calculation. In addition to the risks concerning planning consents, it also highlighted increased commercial risks owing to the worsening property development market conditions.
- 23.12 In responding to our draft determinations Network Rail has revisited them and revised them downwards. Table 23.2 shows the updated projection of property income. Property rental income is revised down by 4% relative to the SBP forecast, to £909m over the control period. We have assumed that the profile of rents is flat since Network Rail provided no revised profile. Sales income forecasts were reduced by 25% to £95m over CP4.

Table 23.2: Updated Network Rail forecast of property income since our draft determinations

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total |
|---------------------|---------|---------|---------|---------|---------|-------|
| Property rental | 182 | 182 | 182 | 182 | 182 | 909 |
| Property sales | 9 | 9 | 34 | 18 | 24 | 95 |

Our determination on property income

- 23.13 We consider that Network Rail has made a strong case that economic conditions have worsened and that these will affect the level of income it can expect from property. We therefore accept Network Rail's revised forecast for property rental income as set out in table 23.2.
- 23.14 While we also accept that the market conditions mean that it will be more efficient for Network Rail to delay some property sales, we consider that this income derived from its property portfolio should be postponed rather than lost. We have therefore deferred the reduction in sales forecast (£17m and £16m in each of 2009/10 and 2010/11) to the last two years of CP4, rather than assuming this potential income is lost as Network Rail has done.
- 23.15 We have reconsidered our draft determinations in respect of income from developments at Euston and Victoria in the light of Network Rail's revised property market forecasts. While we consider that it is important that an incentive to realise the value of these station developments is retained, we accept that the worsening outlook for the London property market together with the size of the expected cash income from these schemes means the risks are considerably increased. Therefore, while we continue to include the forecast income from these schemes in our revenue requirement calculation, should the value not be realised in CP4 we will compensate Network Rail for this shortfall in income in its CP5 revenues. In order to retain a specific incentive to progress these schemes, this compensation would not include the financing cost of the income shortfall.

Treatment of property income in revenue requirement calculation

- 23.16 The SBP and SBP update assumed that a significant proportion of the value of property sales would be realised not in cash but rather in enhancements taken in lieu of cash ('hypothecated gains'). For example, in exchange for land to develop commercial premises, a developer might enhance the station by installing lifts at a station.
- 23.17 The regulatory treatment of hypothecated gains in PR08 is important because Network Rail's decision to take significant benefits in the form of hypothecated gains could potentially reduce other single till income in CP4 if the company could have received a cash value instead. (This would increase Network Rail's net revenue requirement recovered through access charges.)
- 23.18 During CP3 we introduced a policy of allowing hypothecated gains below a value of £5m per scheme and £50m per annum to be added to the RAB (hence producing an income stream for Network Rail) in order to incentivise Network Rail to accept enhancements where these would be more valuable than the cash alternative. Hypothecated gains of more than the £5m cap can be added to the RAB if funders agree. We have recently consulted on whether this policy is appropriate or whether we should make changes.
- 23.19 For PR08, Network Rail has projected hypothecated gains of £255m (or £109m excluding Euston and Victoria) for the control period as a whole, exceeding the maximum annual values. Our focus when deciding on the treatment of these projected gains has been to ensure that there is no possibility of customers and funders paying twice. First, if there is an alternative cash value to the hypothecated gain, forgoing this cash would lead to a lower single till income and higher access charges. Second, if projected hypothecated gains are then added to the RAB, Network Rail would receive additional income through the allowed rate of return.
- 23.20 We have considered whether to count at least part of the forecast hypothecated gains benefits as income, as if they were cash from sales, in order to remove any possibility of over funding in CP4 if Network Rail subsequently decided to take cash instead of enhancements in return for property. Since our draft determinations Network Rail has explained that there is expected to be no alternative cash opportunity from the forecast hypothecated gains in CP4 because the developments are in the main above stations. This means that, without prior development of the station, there is no development site for sale.
- 23.21 We have considered Network Rail's explanation and believe it to be reasonable. Given that there is no cash alternative to the forecast gains, Network Rail needs no additional incentive to choose to take the more valuable assets over cash. Although the hypothecated gains will benefit customers, they and funders have not requested them in the periodic review, and we do not believe that it would be reasonable to expect them to pay through a RAB addition. We will not assume that there is an alternative cash value to hypothecated gains which would otherwise be included in single till

income, but neither will we add the SBP forecast hypothecated gains to the RAB.

23.22 If during CP4 the SBP forecast level of hypothecated gains is exceeded (that is if Network Rail accepts hypothecated gains totalling more than £255m including Euston and Victoria) then we will consider further gains for addition to the RAB on a case-by-case basis according to our published policy.

Depots and other income

23.23 Network Rail's forecast assumes that income from depots will remain at the same level as the last two years of CP3, £46m per annum. We accept Network Rail's assumption that lease income from existing depot facilities will not change significantly in CP4.

23.24 We considered whether significant extra income was likely to arise from new or enhanced depot facilities in CP4. The ownership of any additional depot facilities required to achieve HLOS outputs is not yet certain, but we estimate that the likely lease cost of these facilities would be less than £10m per annum. We have therefore taken account of this cost in our assessment of the affordability of the HLOS, but we do not think it is appropriate to include this income in our single till calculation because of the significant uncertainty over ownership of these facilities.

23.25 Network Rail also receives a small amount of other income from various other sources. We have assumed that Network Rail's forecast of stable levels through CP4 is reasonable. Since the draft determinations we have discussed the treatment of Network Rail's income from the Channel Tunnel Rail Link (CTRL) with Network Rail and decided to include forecast net income of £5m per annum in other single till income as an estimate of the cash benefit to Network Rail Infrastructure Limited of Network Rail CTRL

Summary

23.26 Table 23.3 summarises our assessment of projected other single till income in CP4.

Table 23.3: Assessment of other single till income in CP4 (Great Britain)

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total |
|---------------------|------------|------------|------------|------------|------------|--------------|
| Property rental | 182 | 182 | 182 | 182 | 182 | 909 |
| Property sales | 9 | 9 | 34 | 62 | 72 | 186 |
| Depots | 46 | 46 | 46 | 46 | 46 | 231 |
| Other | 7 | 7 | 7 | 7 | 7 | 35 |
| Total income | 244 | 244 | 269 | 298 | 307 | 1,363 |

Rounded to the nearest million.

PART E: CONTRACTUAL AND FINANCIAL INCENTIVES

24. Contractual and financial incentives

Overview

- 24.1 In PR08 we have undertaken a thorough review both of the incentives facing Network Rail and of the alignment of incentives between industry players, the public interest and our long-term vision for the industry.¹⁵⁰ As a result, we have sought to strengthen and better align these incentives in a number of areas.
- 24.2 We want to ensure that Network Rail's management faces strong incentives to deliver on all of its wide-ranging obligations along with the efficiency savings that we are requiring and, indeed, go on and deliver outputs above and beyond the level that we have established in this determination.
- 24.3 We have already discussed in chapter 14, a key strengthening of corporate financial incentives through the proposed restriction on using the government guarantee to raise additional debt. But incentives come in many different forms. For the management of Network Rail, the personal challenge associated with meeting its objective of becoming world class and the impact on individual reputations of success and failure provides in itself a very real incentive to perform well. This incentive is made all the stronger by the intense public scrutiny that is applied to cost control and performance throughout the railway and the transparency with which we report Network Rail's progress.
- 24.4 We believe that it is important to ensure that there are clear rewards and penalties associated with the achievement of the targets and non-achievement respectively. In a company limited by guarantee (CLG), however, it is reasonable to ask whether financial incentives will necessarily be as effective as in a shareholder owned company, particularly incentives significantly to outperform regulatory targets. We believe that financial incentives still have a powerful role to play in motivating Network Rail's management and can impact on the relationship between Network Rail and its customers. We believe they work in the following ways:
- outperformance of our determination allows the company to make a higher surplus, providing a buffer against future shocks to the business or money to be reinvested in the network, thereby enhancing the reputations of the company and senior management;
 - achievement and outperformance of outputs and financial targets benefits management through bonuses received under the management incentive plan; and

¹⁵⁰ *Periodic Review 2008: Enhancing Incentives for Continuous Improvements in Performance*, Office of Rail Regulation, July 2006. This may be accessed at www.rail-reg.gov.uk/upload/pdf/298.pdf.

- they can provide additional incentives on train operators to work with Network Rail to improve performance and reduce cost.

24.5 Therefore, incentive regimes with associated financial rewards and penalties, set by us, can have a very direct impact on behaviour. Part E of this document explains the contractual and financial incentives that we are introducing or strengthening to complement the wide-ranging incentives and pressures on Network Rail, working with its industry partners, to deliver, and outperform, the outputs that it is being funded for through this periodic review. We set out our determination on the contractual incentives that are contained in Schedules 4 and 8 of train operator track access contracts, which cover, respectively, the possessions regime and the performance regime. We also set out our determination on financial incentives for CP4, covering the volume incentive, efficiency benefit sharing and 'fine-tuning' of HLOS delivery.

24.6 To reinforce the incentives facing management, we expect Network Rail to adjust the incentive plan which is used to determine the remuneration that the company's senior managers receive in light of the determination that we have reached in this periodic review. Condition 28 of the company's network licence requires that Network Rail should have regard to the targets set by us when formulating this plan.

25. Schedule 8 – performance regime

Introduction

25.1 This chapter sets out our determination on the changes that we are making to the performance regime contained in schedule 8 of passenger and freight operator track access contracts. The structure of the passenger performance regime will remain unchanged, with the main changes being to update the benchmark levels of Network Rail's and each franchised passenger train operator's performance and the train operator payment rates. More significant changes are being proposed for the freight operators' performance regimes in order to simplify them and to ensure a consistent approach across all freight operators so that competition between them is not distorted. Changes include standardised benchmarks and payment rates applicable to all freight train operators and normalised for traffic growth.

Background

- 25.2 With vertical separation between infrastructure management and train operations, it is important to align the interests of the infrastructure manager with the train operators in relation to seeking to minimise delays to train services. Passenger train operators are concerned about the performance of their services because of the adverse impact on their customers of poor reliability, which leads to lower passenger numbers and revenues over time. 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 (potentially after cumulative poor performance) on revenue through the loss of customers.
- 25.3 The schedule 8 performance regime in track access contracts of both passenger and freight train operators is one element of a wide range of factors that encourage Network Rail and train operators continuously to improve performance.
- 25.4 It is also widely recognised as the best available approach to provide a basis for compensation to train operators for the impact of lateness and cancellations on their revenues. This is particularly important in minimising any risk premium that franchised passenger train operators would otherwise factor into franchise bids to reflect the possibility of Network Rail providing poor levels of performance.

Draft determinations on changes to the passenger performance regime

Introduction

- 25.5 The changes set out in our draft determinations to the passenger performance regime were informed by the work of an industry group¹⁵¹ and the responses to a wider industry consultation in April 2007¹⁵² that sought views on the proposals developed by that group.
- 25.6 The structure of the regime and significant elements of it were reviewed in our 2005 performance regime review. Changes made at that review were implemented from 1 April 2006. The industry working group's recommendation was to retain the existing structure and that the key priority for PR08 was to review those aspects that had not been reviewed in 2005 (except in one case where the determinations made at the 2005 review expire at the start of CP4 unless updated).
- 25.7 The wider consultation revealed broad support for the industry group's proposals. We are satisfied that they will further the twin objectives of the regime of adding to the incentives of Network Rail and train operators to improve performance and providing adequate compensation to train operators in the event of poor performance. We have therefore determined that we should make the changes as supported by the industry working group as detailed below. The changes are intended to:
- ensure that benchmark levels of performance for CP4 are realistic but challenging to all parties and that the Network Rail benchmark reflects the overall performance improvements that we are requiring it to make during CP4;
 - ensure that the payments made by train operators, when they delay other train operators, reflect as accurately as possible the effects on the revenue of the affected operator;
 - change the threshold at which sustained poor performance is defined so that it is a more relevant protection for train operators; and
 - improve the process by which changes can be made to the performance regime during a control period when certain conditions have been met.

Network Rail benchmark

- 25.8 The performance regime is a benchmarked regime. That is, there is an allowance for some level of delays to occur for which no compensation will be paid. The Network Rail benchmark is set (normally at a periodic review) at a

¹⁵¹ The group comprised representatives of Network Rail, train operators, ATOC, DfT and Transport Scotland.

¹⁵² *PR08: changes to the passenger performance regime (Schedule 8)*, Office of Rail Regulation, London, April 2007. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/pr08-perfreg-let-200407.pdf>.

realistically achievable but challenging level. Where both Network Rail and train operators perform at their respective benchmark levels no payments are made.

25.9 Our changes update the Network Rail benchmark to take account of:

- actual performance between December 2005 and December 2007 (the recalibration period);
- committed performance by Network Rail to train operators between the end of the above period and 1 April 2009; and then
- reductions year on year in CP4 reflecting Network Rail's improvement trajectory.¹⁵³

Train operator benchmark

25.10 The train operator benchmark is also set (normally at a periodic review) at an achievable but challenging level.

25.11 The change we are making is to update the train operator benchmark to take account of actual performance between December 2005 and December 2007, with no improvement trajectory across CP4. Train operators already face significant financial incentives to improve performance because they feel the effect directly in terms of the impact on their revenues. We don't believe that setting an improvement trajectory for train operators in Schedule 8 would materially enhance the incentives which the train operators already face, whilst it would increase the risk to them, which we assume would be factored into future franchise bids.

Train operator payment rate

25.12 The train operator payment rate sets the basis for train operator payments that, via Network Rail, compensate other train operators for the impact that the former has on the latter's train service performance and hence revenue.

25.13 The change we are making is to update the train operator payment rate to reflect:

- the latest pattern of impacts of each train operator's performance on other train operators; and
- the removal by many train operators of passenger charter arrangements. In the past, the train operator payment rate has included an element that provides for compensation to other train operators in relation to these passenger charter provisions.

¹⁵³ While the final performance trajectory for each train operator, consistent with our determination of the high level performance outputs for Network Rail, will only be known when the company publishes its 2009 delivery plan, an approximation using the trajectory included in its SBP update will be used for the performance regime Network Rail benchmark.

- 25.14 Some train operators said that two further elements of the performance regime should have been updated with the recalibration work. These were:
- update the Network Rail payment rates (last updated in the 2005 review) for the difference between the movement of the retail price index (reflected in track access contracts) and actual revenue; and
 - review the monitoring point weightings to make sure that these still reflect as accurately as possible the actual revenue affected by lateness/cancellations at specific points on the network for services within a service group.

25.15 As there was not unanimity among train operators that these should be part of the work, we discussed with ATOC the costs and benefits of incorporating these elements into the review of the regime. On the basis of those discussions, we decided that we would not include these elements. The Network Rail payment rates were revised in the 2005 performance regime review and therefore have only been in place a short time. While the monitoring point weightings have not been reviewed since the periodic review 2000, if these are materially different from reality there is nothing to stop train operators proposing to change them. We are not aware of any case of this happening.

Sustained poor performance (spp) threshold

25.16 The spp threshold was established in our 2005 passenger performance regime review. Where performance is worse than this threshold, train operators can claim additional compensation in the form of relevant losses. This replaced a broadly equivalent provision in part L of the network code no longer available to franchised passenger operators.

25.17 The threshold levels for CP3 were set as shown in table 25.1.

Table 25.1: Threshold levels for spp in CP3

| Year | spp threshold |
|---------|--|
| 2006-07 | 25% worse than benchmark performance over at least 12 months |
| 2007-08 | 22.5% worse than benchmark over at least 12 months |
| 2008-09 | 20% worse than benchmark over at least 12 months |

25.18 The intention is that the threshold should represent the level of poor performance where compensation under the standard schedule 8 arrangements is materially less than what is needed to reflect the actual impact on the train operator.

25.19 In the discussions of the industry working group, there was agreement that it was difficult to find evidence to determine what the appropriate threshold level should be. One suggestion was to change the threshold to the level of the

worst performance actually experienced in the last few years by any of the train operators (this was Network Rail's performance in relation to First Great Western). Our draft determination was to set the threshold at this level (which was less than 5%)

25.20 While this would make it more likely for the threshold to be breached than currently, there is no guaranteed additional compensation. Train operators would still need to show that additional losses, over and above those compensated through the schedule 8 formula, had been incurred.

Expert determination

25.21 We also reviewed the expert determination provisions in paragraph 17 of schedule 8. This provides for a change to be proposed to schedule 8 during a control period and, where Network Rail and the train operator do not agree on the change, for expert determination, which is then placed before ORR for approval in the form of a section 22 amendment to the track access contract.

25.22 Our draft determinations were to make the following changes so that the provisions are more effective:

- clarify and provide additional detail about the initial proposal from the train operator to Network Rail, and ensure that it includes sufficient supporting information;
- include timescales for the expert's review of evidence;
- set out that the expert should refer to our latest criteria or policy statement and meet with us in informing decisions.

25.23 The industry group also considered whether ORR should undertake the expert role in some or all cases.

Work since the draft determinations

25.24 Since the draft determinations, ATOC, Network Rail and ORR has managed the re-calibration of the Network Rail and train operator benchmarks, and train operator payment rates for CP4, reflecting the changes described above. We commissioned consultants Arup to undertake the work. Franchised passenger operators were consulted on the methodology and data to be used on 9 July 2008.

25.25 On 13 August, we held an industry seminar in which Arup gave further detail on its methodology and we discussed the further modification of the Network Rail benchmark to reflect JPIP commitments and apply the trajectory reflecting Network Rail's SBP update proposals (consistent with the trajectory for use in Network Rail's passenger delay output).

25.26 The output data was circulated to franchised passenger operators on 21 October 2008. The recalibration process is described in the Arup final report

being published alongside these determinations¹⁵⁴. However, the consultation on the specific numbers will continue for the 4 weeks up to 19 November 2008 with us available to respond to questions as necessary.

25.27 We recognised in our draft determinations that any recalibration exercise will inevitably be unable to reflect changes that take place after the work is completed, e.g. the December 2008 timetable changes. In such cases this will mean that specific train operators and Network Rail will need to do separate recalibrations to reflect these later timetable changes. We have sought in the current general recalibration to facilitate such specific recalibrations by:

- being transparent with train operators and Network Rail as to the assumptions of this recalibration work;
- requiring the recalibration modelling to be flexible to enable it to support changes and ensuring that Network Rail has full access to the model to enable it to reflect changes through specific recalibrations; and
- as in previous reviews, enable changes of this nature made through section 22s during the period between the review notice being served and 1 April 2009 to take precedence over the changes made through the review notice.

25.28 On 18 July 2008, we consulted on the legal drafting for the passenger schedule 8. As most of the work focuses on changing the numbers in the regime the drafting focused instead on the paragraph 17 'expert determination provisions'.

Responses

25.29 Network Rail in particular raised some concerns about the proposal to reduce the level of the sustained poor performance threshold to the degree proposed in the draft determinations. The proposal would have led to a threshold less than 5% worse than benchmark. Network Rail's concern was particularly the risk of thresholds being triggered where little or no compensation would be payable (because schedule 8 payments would have been sufficient), leading to an increase in the industry transaction costs without sufficient countervailing benefits.

Our determination

25.30 Our determination on the passenger performance regime confirms our draft determinations, namely that we will:

- update Network Rail and train operator benchmarks and train operator payment rates;
- adjust downwards the spp threshold (but by a smaller amount than in our draft determinations); and

¹⁵⁴ *PR08 passenger performance regime, recalibration, final report*, Ove Arup & Partners, 30 October 2008.

This may be accessed at www.rail-reg.gov.uk/upload/pdf/pr08-aruppprr-301008.pdf

- refine the performance regime change process (paragraph 17 of schedule 8).

25.31 As our consultants have worked through an extensive due diligence exercise we expect that the recalibrated data currently being reviewed by franchised passenger train operators will be the final data. However, we are prepared to answer queries during the 4 week consultation period and if necessary will discuss and resolve any specific technical issues that arise. We are confident that the approach used is technically sound and therefore expect such issues to be few and resolvable well before the start of the PR08 implementation process.

25.32 In addition to publishing the final report, Arup is providing to Network Rail the supporting data and models to aid with future operator specific re-calibrations.

25.33 Our determination for the spp threshold reflects the concerns identified in response to our draft determinations and further discussions with industry parties. In particular, we discussed with First Great Western whether the level of poor performance it experienced (the basis for the spp threshold in the draft determinations) is likely to have meant that the standard schedule 8 rates materially under-compensated the company. On the basis of these discussions, there appears to be no strong evidence that schedule 8 compensation was materially insufficient to compensate First Great Western for the effects of poor performance. This would suggest that the spp threshold should be set at a higher level than in our draft determinations, otherwise transaction costs could be increased without sufficient offsetting benefits.

25.34 Our judgement is that setting an spp threshold 10% above benchmark would strike an appropriate balance between offering adequate financial protection for train operators in the event of sustained poor performance whilst unlikely to be triggered frequently and therefore ensuring that unnecessary transaction costs are not incurred. This remains significantly below the 20% threshold currently in place.

25.35 We are making some changes to the performance regime change process (paragraph 17) based on the feedback from consultees. We will:

- include defined timescales (by which the party receiving the request must respond);
- provide for ORR to have an initial role deciding whether to examine the issue itself or whether it should be referred to an expert. We intend to set out more about the basis for our decision as to whether an expert would be used in such a case and our processes, including timescales in our criteria and procedures document.¹⁵⁵

¹⁵⁵ Criteria and procedures for the approval of passenger track access contracts: fourth edition, Office of Rail Regulation, May 2006. This may be accessed at: http://www.rail-reg.gov.uk/upload/pdf/288-pass_candp4ed.pdf

Draft determinations on changes to the freight performance regime

Introduction

25.36 An industry group led the work in setting objectives for the review of freight operator performance regimes and in developing proposed changes that reflect those objectives. While the overall structure of the regime will be retained, the changes that we have decided should be made, based on the proposals from the industry group, are more fundamental than the changes being made to the passenger operators' regime.

25.37 The industry group proposed changes which are aimed at:

- standardising the regime between freight operators so as to remove any competitive advantage to particular operators from the structure of the regime;
- simplifying the regime as far as possible;
- allowing the regime to adjust automatically to changes in traffic volume or transfer of traffic flows between operators; and
- setting the level of compensation to reflect better the average impact on freight operators' costs and revenue loss.

25.38 While the industry group developed the scope (which involved representation from all freight operators) we consulted formally on the proposed changes in August 2007.¹⁵⁶

Network Rail benchmark

25.39 Our draft determinations set out that the current operator specific Network Rail benchmarks should be replaced with a single 'standardised' benchmark level across all freight operators. This is a key part of meeting the industry group objective of standardising the regime and removing any potential competitive advantage from the structure of the regime. This benchmark level would be updated to be realistic but challenging in CP4. The benchmark level would be in minutes delay per 100 train miles so as to be normalised between operators running different total mileages.

25.40 At the time of our draft determinations, the benchmark was to be based on Network Rail's performance in the recalibration period, December 2005 – December 2007, and then adjusted appropriately to get to April 2009. Network Rail's performance improvement trajectory would then be applied through CP4 (based on the numbers in Appendix 14 of its SBP update). This improvement trajectory is consistent with the freight delay output that we are setting for Network Rail.

¹⁵⁶ *Review of freight performance regimes*, Office of Rail Regulation, 31 August 2007. This may be accessed at http://www.rail-reg.gov.uk/upload/pdf/pr08-fgt_perfreq_rev_let_310807.pdf.

Network Rail payment rate

25.41 The Network Rail payment rate is to be common across all freight operators reflecting the best estimate of the average impact on freight operators of lateness and cancellations.

Freight operator benchmark

25.42 The freight operator benchmark will be common across all freight operators based on average freight performance over the recalibration period. No improvement trajectory has been applied to the freight operator benchmark for the same reasons that improvement trajectories are not applied in respect of passenger operators' benchmarks.

25.43 The freight operator benchmark will also be normalised for other train operators' growth in services. This is needed to ensure that Network Rail does not recover the performance costs of higher service levels through both the capacity charge paid by those operators introducing the additional services and again from freight train operators' performance regime payments.

Freight operator payment rate

25.44 The freight operator payment rate will be common across all freight operators based on the average estimated revenue impact of causing delays other train operators.

Cancellation arrangements

25.45 When Network Rail cancels a freight train, train operators will generally incur costs, for example costs related to moving the train, and any additional staffing and vehicle costs.

25.46 On the basis of evidence put forward by freight operators, the costs of cancellations are, on average, greater than current levels of compensation. Enhanced compensation arrangements should be introduced in respect of cancellations. Our draft determinations were that the arrangements should be as follows:

- performance up to a specified threshold of cancellations (based on previous Network Rail performance) = £1,500 per cancellation;
- performance beyond the specified threshold = £4,000 per cancellation.

Incident cap access charge supplement (acs)

25.47 Freight operators generally have an incident cap in their performance regimes. This caps their performance regime liabilities for lateness and cancellations caused to other train operators resulting from a single incident. The freight operators pay Network Rail an access charge supplement (acs) to reflect the risk that the incident cap places on Network Rail. Performance payments to third party train 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 breached.

- 25.48 The acs has been calculated by Network Rail based on a methodology that estimates its level of risk at different levels of incident cap using several years' data. Network Rail estimates, based on historic data, how many times and by what degree freight operators will breach the particular incident cap level and also includes a contingency to cover for events not witnessed in the period covered by the data (currently the contingency uplift is 20%).
- 25.49 Given that Network Rail has more than twice the data it had when establishing the incident cap acs originally, we have assumed that the contingency element of the acs should be reduced to 10%. Freight operators should be able to choose their favoured incident cap level each year in the knowledge that their acs has been calculated using a consistent methodology.

Annual cap on performance regime liabilities

- 25.50 Each freight operator and Network Rail will continue to have the right to have a reciprocal annual cap on liabilities and this will need to be set in the context of the revised regime. As per our current criteria, this should not be set at a level that is likely to be hit on a frequent basis, for in such cases the performance regime payments can turn into a fixed sum meaning that there is no longer a continuous incentive on both parties to seek to improve performance.

Responses and further work

- 25.51 On 18 July 2008, we consulted on proposed drafting for the freight performance regime along with most of the numbers (payment rates and benchmarks) that had been established. The revised drafting and final numbers were sent to freight operators and Network Rail on 24 October 2008.
- 25.52 Freight operators were invited to propose and seek to agree new reciprocal annual caps on performance regime liabilities with Network Rail by 21 November 2008. At the start of December 2008, we will review the caps put forward (either agreed or not) and determine the final levels to be applied which might include rolling over the current cap where no feasible alternative exists.
- 25.53 In general, responses received to the draft determinations were supportive of the principles of the revised regime but respondents wanted to see all the numbers and assess the specific impact of the new regime on their particular businesses. Once the numbers had been provided to freight operators, some were concerned at the potential increase in liabilities compared with the current arrangements.
- 25.54 Network Rail argued that the enhanced cancellations regime did not leave it financially neutral. The key to this is the difference between the current rates for cancellations (around £900) and the proposed rate of £1,500 (for cancellations below a defined threshold) in the proposed regime.

25.55 An important issue that was identified was that the proposed recalibration period included a considerable amount of poor Network Rail performance in relation to freight traffic. This was partly, but not wholly, due to severe weather conditions. To base the Network Rail benchmark on these levels would be to build in a recent decline in performance.

Our determination on the freight performance regime

25.56 Our determination largely confirms our draft determinations in this area. We consider that the new standardised regime will enable train operators to compete for business without being either advantaged or disadvantaged by different performance regime structures and the enhanced cancellations compensation better reflects the actual impact of a cancellation on an average freight train service.

25.57 However, we have revisited a number of areas in our draft determinations following the consultation responses we received.

Network Rail benchmark

25.58 We agree with freight operators that it would not be appropriate for Network Rail's opening benchmark to be based on a recalibration period which included a deterioration in Network Rail's performance. An alternative approach was discussed with the industry and applied. Essentially this based the Network Rail opening benchmark on the starting levels of performance included in Network Rail's SBP update. This is also consistent with the broad pattern of local output commitments for freight operators, established under part L of the network code.

Payment rates

25.59 Much of the work carried out since our draft determinations has examined the payments that would be implied by the new performance regime based on current and recent actual performance. This work has identified that some small operators in particular could face significantly higher payments than under the existing regime. This could present a barrier to entry for small operators or potentially make existing small operations unviable, although the impact is offset in part by the reduction in access charges this review will deliver.

25.60 We therefore examined the following possibilities to address this:

- deferral of implementation of the regime;
- differential payment rates at different levels of performance; and/or
- application of Network Rail and train operator caps on liability.

25.61 We do not believe that deferring implementation of the regime would be in the overall best interests of the rail freight industry. It appears to us to be disproportionate to defer all the benefits the new regime will bring in order to

solve one particular problem. We believe that there is a more focussed way of addressing this problem, as presented below.

25.62 We believe that a combination of differential payments rates at different levels of performance and an appropriate annual cap agreed between freight operators and Network Rail, would be sufficient to reduce financial risk to an appropriate level and enable a smooth transition from freight operator specific regimes to a standardised freight performance regime.

25.63 In order to make the new regime less risky, particularly to small and new operators, while still reflecting the financial benefits of improved performance, bonus payments made when performance is better than benchmark will be set at a lower rate than the compensation payments made when performance is worse than benchmark. We examined two options for bonus payments (for both Network Rail and train operator payment rates):

- 50% of compensation payments; or
- zero.

25.64 While zero bonus payments would, in some respects, offer the most protection to operators, they would:

- remove the financial incentive that the regime provides for Network Rail and train operators to strive to improve beyond benchmark performance; and
- cause insufficient cost recovery for the regime to be financially neutral at benchmark levels of performance; this is because in some periods during the year, performance will be better than benchmark (resulting in bonus payments) and at other times performance will be worse than benchmark (resulting in compensation payments) – payments are neutral at benchmark levels of performance only where bonus payments from good periods of performance within a year are equal to compensation in the year's bad periods of performance.

25.65 We will therefore set bonus payments at 50% of the level of compensation payments. This will avoid both of the problems associated with zero bonus payments whilst still offering financial protection to freight operators. Although there would remain the possibility of insufficient cost recovery, the effects will be less than with a zero bonus payment rate. By applying differential payment rates above and below benchmark performance levels to both train operators and Network Rail, the possibility of insufficient cost recovery will be further reduced.

Annual caps on liability under the regime

25.66 The selection of the reciprocal annual caps (known in the track access contract as the Network Rail and train operator cap), is one that we agreed in discussions with the industry working group should remain specific to the particular operator. It is an important protection, particularly for freight operators, providing certainty about the maximum liabilities that they could

face under the performance regime. Generally, caps should not be set so low as to disincentivise continuous improvements in performance. But we recognise that in order to offer real protection to train operators and not deter new small scale entry, they will need to be set at a level which is proportionate to the scale of operations. The cap would then change as the size of operations changed.

25.67 We are currently awaiting proposals from train operators and Network Rail as to the levels of reciprocal annual cap they wish to have. We expect agreement to be reached by the end of November 2008 so that they can be included in the CP4 arrangements. Where the parties disagree we will review the submissions from both parties before making a judgement on the appropriate cap. Where no submission is made to us we shall assume the continuation of the current reciprocal cap arrangements.

Cancellations arrangements

25.68 Given the enhanced cancellation arrangements, Network Rail could be faced with making higher compensation payments when it cancels trains than it does currently. However, we have allowed Network Rail an income stream over CP4 which should cover expected increases in compensation if Network Rail operates efficiently.

25.69 As part of its SBP update, Network Rail included a £12 million cost per annum in case we did not implement a new financially neutral freight performance regime as part of PR08. In our draft determinations we reduced this cost to £6 million per annum as we had already made significant progress with the freight performance regime work. We will retain the £6 million allowance in our determination in order to compensate Network Rail for this non-financially neutral element of the regime.

26. Schedule 4 – possessions regime

Introduction

26.1 The structure of this chapter reflects the fact that we published much of our determination on the possessions regime when we published the C8 notice to change the possessions compensation arrangements in part G of the network code in August 2008. For ease of reference this chapter summarises the key elements of our determination on changes that are to be made to the way that compensation is paid to train operators when their normal use of the network is restricted by Network Rail, mainly to undertake engineering work. The changes are based on industry recommendations and take into account subsequent comments made in consultation responses. The changes are aimed at: providing a consistent approach to compensating train operators for the effects of possessions, based on the degree of disruption suffered; compensation levels which more accurately reflect the cost and revenue losses train operators suffer; and reducing transaction costs. This chapter also sets out our conclusions in respect of access charge supplements.

Background

26.2 Compensation for possessions is currently paid through schedule 4 of track access contracts and for network change, through part G of the network code. Schedule 4 is intended to incentivise Network Rail to plan engineering work early (by providing discounts for early notification) and efficiently (by ensuring that Network Rail takes into account both the impact on its own costs and the costs of train operators when developing a possessions strategy).

26.3 It became apparent from discussions with Network Rail and train operators that the current compensation regimes for possessions were not working as effectively as they should. We therefore remitted the industry in January 2007, through the industry steering group, to review the compensation arrangements for possessions¹⁵⁷. In response to our request the industry first put forward proposals for changes to schedule 4 of passenger operators' track access contracts and part G of the network code (for both passenger and freight operators). Recommendations for changes to freight operators' schedule 4 were then made in July 2008.

26.4 On 8 April 2008, based on the industry's proposals, we consulted on the changes that we intended to make to schedule 4 of passenger operators' track access contracts and part G of the network code (for both passenger and freight operators).¹⁵⁸ On 11 July 2008 we consulted on changes to freight

¹⁵⁷ Our letter and remit for the industry is given in *Train operator compensation for possessions*, Office of Rail Regulation, January 2007. This may be accessed at www.rail-reg.gov.uk/upload/pdf/pr08-toc_comp.pdf.

¹⁵⁸ *Periodic Review 2008: Train Operator Compensation from Possessions – consultation on changes to the compensation regime for passenger operators and Part G of the Network*

operators' schedule 4. On 18 August 2008 we set out our conclusions on both passenger and freight operators' schedule 4 and part G of the network code, together with a C8 notice making the required changes to part G¹⁵⁹. Our conclusions in respect of the revised arrangements, including how we have considered consultation responses, can be found in that document and that document is incorporated into this determination. For ease of reference though, this chapter provides a summary of our determination on these issues. First we set out the current arrangements for possessions compensation and the key elements of the industry's proposals.

Current compensation arrangements

26.5 Train operators receive compensation for possessions and amended timetables through the following arrangements:

- Under schedule 4, in return for the payment of an access charge supplement, franchised passenger operators receive formula based compensation for revenue losses (but not costs) from planned possessions and, for significant disruption (generally longer than a weekend) or for possessions related to a major project (and in each case not related to network change), receive compensation for certain categories of costs (but not any additional revenue loss). Schedule 8 provides formula based compensation for revenue losses from unplanned possessions (including possession overruns).
- Some open access passenger operators have signed up to different parts of the schedule 4 provisions set out above, whilst others have no schedule 4 provisions at all.
- For freight operators, schedules 4 and 8 provide compensation for service variations and cancellations in respect of short notice/unplanned/overrunning possessions notified after T-12 (i.e. twelve weeks before the date of the timetable in question).
- Under part G of the network code, for possessions associated with network change, most passenger and freight operators can claim for full revenue losses (over and above that receivable under the schedule 4 formula) and for costs, direct losses and expenses (including loss of revenue), net of any benefits.

Code for all operators, Office of Rail Regulation, April 2008. This may be accessed at www.rail-reg.gov.uk/upload/pdf/pr08-poss_comp_pass_090408.pdf.

¹⁵⁹ *Periodic Review 2008: Final conclusions - Compensation for Possessions*, Office of Rail Regulation, August 2008. This may be accessed at www.rail-reg.gov.uk/upload/pdf/comp4poss_180808.pdf

Passenger regime

Our determination

26.6 Our determination on the passenger regime set out a new tiered structure of compensation in schedule 4 for CP4. For franchised passenger operators, in return for the payment of an access charge supplement, schedule 4 will provide formulaic cost and revenue compensation for all possessions, but with additional compensation available depending on the level and impact of disruption. As a consequence, part G compensation for possessions will be withdrawn. In summary the characteristics of each of the proposed tiers are:

- type 3 possessions: single possession greater than 120 hours (includes public holidays), will receive formulaic compensation as default but with the possibility of actual revenue losses and costs (subject to a materiality threshold);
- type 2 possessions: single possession greater than 60 hours, but equal to or less than 120 hours, (excludes public holidays), will receive formulaic compensation as default but with the possibility of actual costs (subject to a materiality threshold and in respect of categories of direct costs only) mirroring existing Significant Restrictions of Use arrangements; and
- type 1 possessions: all other possessions will receive formulaic based revenue and cost compensation.

26.7 In addition to this, compensation will be available for “sustained planned disruption” on a similar basis to type 3 possessions. This would be triggered when:

- the revenue loss compensation;
 - over 3 consecutive periods is greater than 20% of defined service group revenue; or
 - over 7 consecutive periods is greater than 15% of defined service group revenue; or
- the difference between formulaic cost compensation and reasonably incurred costs is greater than £0.5m over 3 consecutive periods or £1m over 7 consecutive periods (apart from Chiltern, Merseyrail, C2C, London Overground and open access operators where values of £0.25m and £0.5m respectively will be used to reflect the limited ability of smaller operators to absorb exceptional costs).

26.8 Open access passenger operators will be able to claim compensation for type 3 possessions and sustained planned disruption (i.e. compensation for significant disruption), but will need to pay an access charge supplement (like franchised operators) to be able to claim compensation for type 1 and type 2 possessions.

26.9 One of the main developments is the introduction of a cost formula to compensate for bus and train mileage costs resulting from possessions, consisting of:

- rail replacement bus costs – based on a new estimated bus miles (EBM) parameter which takes into account the number of trains operating, the mileage affected and the actual impact on the service; and
- net effect on costs of changes in train mileage – taking into account track access charges, fuel costs, etc.

26.10 There is also an increase to the notification discount factors (increasing the amount of revenue compensation) to reflect better the way passengers perceive and respond to disruption to train services (see tables 26.1 and 26.2 below):

Table 26.1: Revised notification factors for service groups with delay multiplier of 2.5

| | By First Working Timetable | By Informed Traveller Timetable | By Actual Timetable |
|--|----------------------------|---------------------------------|---------------------|
| Existing notification discount factors | 40% of MRE payable | 60% of MRE payable | 80% of MRE payable |
| New notification factors | 55% of MRE payable | 70% of MRE payable | 85% of MRE payable |

Note: MRE is marginal revenue effect

Table 26.2: Service groups with delay multiplier 5.1/6.5

| | By First Working Timetable | By Informed Traveller Timetable | By Actual Timetable |
|--|----------------------------|---------------------------------|------------------------|
| Existing notification discount factors | 19%/15% of MRE payable | 50%/48% of MRE payable | 80%/80% of MRE payable |
| New notification discount factors | 45% of MRE payable | 65% of MRE payable | 85% of MRE payable |

26.11 We have also included cost compensation from any unplanned extension of a possession (i.e. possession overrun) as well as a planned possession.

26.12 Compensation for competent authority possessions which do not result from network change will be paid through the schedule 4 regime – leaving it to Network Rail to recover associated costs directly from competent authorities; and Network Rail will only be obliged to compensate train operators for the effects of disruptive possessions resulting from network change attributable to a competent authority direction or change of law where, and to the extent that, Network Rail recovers compensation from the competent authority or any other governmental body.

26.13 We consider that where there are bespoke compensation arrangements related to specific works on the West Coast Main Line (WCML) that had already been agreed for the next control period, these should remain in place.

Access charge supplements

26.14 We stated in our final conclusions on possessions compensation that we would revise the access charge supplements to be consistent with our determination on expenditure and network availability. In its response to our draft determinations and after our final conclusions on possessions compensation, Network Rail suggested that access charge supplements should also be amended as follows:

- uplifted to reflect the impact on possessions compensation (through the introduction of emergency timetables) of the increased frequency of extreme weather which Network Rail states is likely to occur in the future;
- uplifted to reflect real revenue growth, to the extent to which TOCs will be able to claim actual revenue loss through schedule 4; and
- amended to reflect only the maintenance and renewals elements of the proposed PDI-P target (possessions disruption index for passengers) - the original supplement reflected the total PDI-P target which also included enhancements.

26.15 We have considered each of these changes and have concluded that:

- we should not include an uplift for the assumed increased frequency of extreme weather as we consider that this is already reflected in the £5m allowance we have made for emergency timetables;
- we should amend the access charge supplements to reflect the impact of expected real revenue growth for passenger train operators since this is the basis on which compensation will be paid. This increases the allowance for negotiated revenue compensation from 1.9% to 2.3%;
- we should amend the access charge supplements to reflect maintenance and renewal PDI-P only and to reflect our determinations on expenditure.

26.16 The overall impact of these changes is to increase total access charge supplements in each year, the difference being in excess of £3m in the final year of CP4. The final access charge supplements are shown in Table 26.3.

Table 26.3: Access charge supplements for franchised passenger operators.

| £m 2006-07 prices | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|------------------------------|--------------|--------------|--------------|--------------|--------------|
| Arriva Trains Wales | 1.1 | 1.0 | 1.0 | 0.8 | 0.8 |
| Arriva Cross Country | 11.4 | 10.1 | 10.3 | 8.2 | 7.8 |
| c2c | 2.0 | 1.8 | 1.8 | 1.4 | 1.4 |
| Chiltern | 2.2 | 2.0 | 2.0 | 1.6 | 1.5 |
| East Midlands | 6.2 | 5.5 | 5.6 | 4.5 | 4.2 |
| First Capital Connect | 6.2 | 5.5 | 5.6 | 4.5 | 4.3 |
| First Great Western | 32.4 | 28.8 | 29.3 | 23.4 | 22.1 |
| First ScotRail | 5.2 | 4.6 | 4.7 | 3.7 | 3.5 |
| First Trans Pennine Express | 1.8 | 1.6 | 1.6 | 1.3 | 1.2 |
| Gatwick Express* | 2.6 | 2.3 | 2.3 | 1.8 | 1.7 |
| Heathrow Connect | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| London Midland | 1.9 | 1.7 | 1.7 | 1.4 | 1.3 |
| London Overground | 0.4 | 0.4 | 0.4 | 0.3 | 0.3 |
| South Eastern | 3.1 | 2.8 | 2.8 | 2.3 | 2.1 |
| Merseyrail | 2.2 | 2.0 | 2.0 | 1.6 | 1.5 |
| Northern | 2.0 | 1.8 | 1.8 | 1.5 | 1.4 |
| National Express East Coast | 30.7 | 27.2 | 27.7 | 22.1 | 21.0 |
| National Express East Anglia | 7.1 | 6.3 | 6.4 | 5.1 | 4.8 |
| Southern | 6.8 | 6.0 | 6.1 | 4.9 | 4.6 |
| South West Trains | 14.8 | 13.2 | 13.4 | 10.7 | 10.1 |
| Virgin West Coast | 29.5 | 26.2 | 26.7 | 21.3 | 20.2 |
| Total | 169.7 | 150.7 | 153.4 | 122.5 | 115.9 |

Note: Gatwick Express is now part of the Southern franchise.

Freight regime

Current regime

26.17 Under schedules 4 and 8 of track access contracts, freight operators receive compensation for late notice possessions (after T-12) for a reason attributable to Network Rail and where the variation meets one or more of a list of criteria. These criteria are set out in schedule 4 and are intended to cover circumstances, such as the use of a longer diversionary route or a delayed departure time, which are likely to cause the operator significant additional costs. Freight operators also receive compensation for cancellations notified after T-12. Our criteria and procedures for the approval of track access contracts specifies that we would currently expect the service variation sum and cancellation sum to be approximately £400 and £900 respectively (in

2006-07 prices). Freight operators are able to obtain higher compensation in return for the payment of an access charge supplement.

- 26.18 Under part G of the network code, for possessions associated with network change, freight operators can claim for full revenue losses (over and above that receivable under the schedule 4 formula) and for costs, direct losses and expenses (including loss of revenue), net of any benefits.

Our determination

- 26.19 Our determination sets out three new tiers of compensation within schedule 4 for extreme planned disruption notified before T-12. Each tier of compensation reflects the impact that disruption has on freight services. Flat rate liquidated damages compensation will be paid for the first two tiers, with the possibility of additional actual costs/losses available for the most disruptive possessions. In addition, compensation currently available under schedule 4 for late notice cancellations and service variations will be harmonised across freight operators and increased to ensure adequate compensation through the new regime.

- 26.20 In return for the enhanced provisions, freight operators would no longer be able to claim compensation for possessions under part G of the network code. The structure of the new regime is described in Table 26.4. In addition, freight operators would be able to claim actual cost compensation for late notice cancellations or service variations that meet the relevant triggers for category 3 disruption. We do not consider that there should be a de-minimus threshold for access to compensation.

- 26.21 Compensation is also available for on the day disruption, paid through schedule 8. The new schedule 8 provisions will provide for compensation of £1,500/£4,000 per cancellation depending on whether Network Rail performance is better or worse than threshold.

- 26.22 We have also included a new provision to allow the compensation sums and related provisions to be revisited after a year of operation of the new regime if they are not providing broadly the level of compensation envisaged.

- 26.23 Our criteria are that the compensation sums and criteria will need to be revised where the total of:

- any compensation that Network Rail is liable to pay to freight operators under schedule 4 in respect of the financial year 2009-10 relating to possessions notified in all material aspects prior to the relevant possession notice date;
- any additional compensation that Network Rail is liable to pay to freight operators under schedule 4 for the financial year 2009-10 as a consequence of the increase in the late notice cancellation sum from £942 to £1,308 (2006-07 prices); and
- any additional compensation that Network Rail is liable to pay to freight operators under schedule 4 for the financial year 2009-10 as a

consequence of extending the coverage of category 3 (actual cost) compensation to late notice cancellations and service variations which satisfy the appropriate criteria is 50% greater or less than £9m (in 2007-08 prices, £8.63m in 2006-07 prices) (being the level of total compensation assumed at the date of these conclusions) after taking into account the difference in the level of disruption to freight operators by possessions on the Network and the change in the level of freight train mileage.

- 26.24 The provision requires Network Rail, as it will have access to information for each operator, to make a reference to us and we would expect Network Rail to make a reference in respect of all operators whose contracts incorporated this provision at the same time unless there was a valid reason for it not doing so. We made it clear that although this is a modification provision contained in a bilateral contract we would consult all affected operators on any proposed modifications because we accept that this is an issue which affects all operators and in which they have a legitimate interest.
- 26.25 As with the passenger regime we are content to preserve existing bespoke compensation arrangements that extend beyond 1 April 2009 that have already been agreed between parties.

Part G

- 26.26 The main effect of the changes being made to part G of the network code is to exclude part G compensation being payable by Network Rail to train operators in respect of any costs, direct losses or expenses incurred by train operators as a consequence of any restriction of use in connection with the implementation of a proposed network change.
- 26.27 The treatment of competent authority compensation are also being amended.

Table 26.4: Final structure of freight possessions compensation regime (2006-07 prices)

| Possession notified before T-12 | Possession notified after T-12 |
|---|---|
| <p>Category 1 compensation – £360 per service</p> <ul style="list-style-type: none"> • Additional end to end journey distance greater than 10 miles; or • Planned departure time from Origin differs by more than 60 minutes; <p>or</p> <ul style="list-style-type: none"> • Planned arrival time at Destination differs by more than 60 minutes; <p>or</p> <ul style="list-style-type: none"> • More demanding length or weight restrictions imposed. | <p>Service variation - £493 per service</p> <ul style="list-style-type: none"> • 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 a 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 Spot Bid |
| <p>Category 2 compensation - £959 per service</p> <ul style="list-style-type: none"> • 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. | <p>Late notice cancellation - £1,295 per service</p> <ul style="list-style-type: none"> • The service is cancelled |
| <p>Category 3 compensation – possibly of actual costs/losses in addition to liquidated damages</p> <ul style="list-style-type: none"> • Access from Origin or to Destination is blocked (inc. 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. | <p>Category 3 compensation – possibly of actual costs/losses in addition to liquidated damages</p> <ul style="list-style-type: none"> • Access from Origin or to Destination is blocked (inc. 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. |

Note: Origin and Destination as per the definitions in Clause 1 of the freight track access contract.

27. Financial incentives

Introduction

27.1 In this chapter we set out our determination on financial incentives for CP4, covering the volume incentive, efficiency benefit sharing and 'fine-tuning' of HLOS delivery.

Background

27.2 As set out previously, our aim is to establish a regulatory framework that reinforces the incentives on Network Rail to perform well each of its wide ranging roles, to forge effective partnerships with passenger (both franchised and open access) and freight train operating companies as well as other industry parties to improve whole industry outcomes, and to allow for the appropriate balance between its various objectives to be achieved.

27.3 Our review of the incentives currently facing Network Rail and its industry partners highlighted misalignments in incentives between industry players and the public interest. In particular, we believe that:

- Network Rail currently faces relatively weak incentives to grow and develop the network, even where this would result in revenue growth;
- franchised TOCs face weak financial incentives to encourage Network Rail to reduce its costs; and
- franchised TOCs' incentives and freedom to optimise network usage are limited.

27.4 In our update on the framework for setting outputs and access charges in February 2008, and confirmed in our draft determinations, we said that we intended to:

- continue to provide a volume incentive, to encourage Network Rail to respond to greater than anticipated demand growth, but to make the payments more direct rather than the current method of providing a RAB addition, for which Network Rail is remunerated over 30 years;
- provide an efficiency benefit share mechanism to incentivise TOCs and FOCs to play a greater role in encouraging Network Rail to improve its efficiency; and
- enable the industry to fine-tune the inputs to deliver the HLOSs in light of emerging information.

- 27.5 Following extensive engagement with the industry, we set out the way in which these incentives would be implemented. All three incentive mechanisms have received wide industry support.
- 27.6 We set out the payment rates for the relevant incentives in our draft determinations.

Volume incentive

Draft determinations analysis

- 27.7 The DfT HLOS sets out end of CP4 capacity requirements based on expected passenger demand growth. The Transport Scotland HLOS assumes passenger demand growth of 3% per annum in passenger kilometres, plus additional specific route based growth. Neither HLOS provides freight forecasts. However, the freight route utilisation strategy (RUS) provides demand forecasts for freight, which have been adopted by the industry.
- 27.8 Network Rail is being funded to deliver this capacity, and it will include a range of projects to provide the capacity for the expected demand growth in its CP4 delivery plan.
- 27.9 The delivery of the capacity related schemes set out in Network Rail's CP4 delivery plan (or as amended subject to change control), which must achieve the HLOS capacity specification, will form part of the reasonable requirements of customers and funders, which Network Rail will be obliged to deliver (subject to the RFF process described in chapter 14). The company should therefore face strong financial and reputational incentives to accommodate the demand growth envisaged in its regulatory settlement.
- 27.10 Actual demand growth may well be higher than envisaged. Indeed, some stakeholders have expressed the view that this is likely to be the case.
- 27.11 However, the structure of charges means that Network Rail faces weak financial incentives to meet such demand. This is because the running of an additional train results in additional revenues for Network Rail equal to the relevant variable charge. This variable charge is designed to cover the long-run efficient cost of the additional wear and tear to the infrastructure imposed by the additional train. To the extent that the actual wear and tear cost incurred by Network Rail is above the long-run efficient cost, Network Rail may actually be financially disincentivised to accommodate additional demand.
- 27.12 We therefore believe that there is a rationale for continuing to provide Network Rail with a volume incentive; and that this should incentivise the company to meet unanticipated increases in demand, largely we anticipate through non-capex intensive solutions. But we want to make

the incentive more direct and hence more powerful by remunerating Network Rail over a much shorter period than currently.

27.13 Therefore, as we set out in our draft determinations, we intend to implement a strengthened and updated version of the existing volume incentive. This will provide Network Rail with additional revenues dependent on its ability to accommodate increases in passenger and freight volume metrics, subject to delivering HLOS capacity outputs. In particular:

- **The baseline:** Network Rail will receive additional revenues for accommodating demand over and above that envisaged in the HLOSs and the freight RUS, and therefore in its SBP. Payment rates will not be made for ESI coal or spent nuclear fuel as we have identified that these markets are effectively captive to rail¹⁶⁰ and Network Rail will already benefit financially from receiving a freight only line charge. The mechanism will remain 'upside only', i.e. failure to deliver capacity to meet levels of growth forecast in the SBP (subject to the change control mechanisms) should be addressed through other parts of the regulatory framework, in particular through the enforcement of Network Rail's licence, as set out in chapter 31.
- **Volume indicators:** We will retain the existing metrics. Network Rail will therefore receive additional revenue if passenger train miles, passenger farebox revenue, freight train miles and/or freight gross tonne miles are higher than envisaged in the SBP (and by government in the case of farebox revenues). We have reviewed carefully the appropriateness of these metrics. Though some stakeholders have expressed the view that the farebox revenue metric should be dropped, we believe that its retention is important in promoting effective partnerships between TOCs and Network Rail.
- **Test of HLOS delivery:** There is not a one-to-one correspondence between the volume indicators set out above and the delivery of the HLOS capacity outputs. It is therefore possible that the volume indicators are at levels at or above those set out in the SBP (or envisaged by government, e.g. for farebox revenue) but that Network Rail is not deemed to have delivered its capacity outputs. Network Rail should not receive additional revenues under the volume incentive where this is the case. Any payments will therefore be subject to Network Rail having delivered its capacity related schemes.
- **Incentive rates:** The passenger incentive rates were introduced at the October 2000 access charges review (which combined were equivalent to 1 penny per passenger mile). They were based on

¹⁶⁰ See annex D of *Consultation on caps on freight track access charges*, Office of Rail Regulation, December 2006. This may be accessed at www.rail-reg.gov.uk/upload/pdf/310.pdf.

25% of the estimated social value of additional passenger miles plus 25% of additional farebox revenue. Freight incentive rates were set in our freight charging review final conclusions in October 2001 and were calculated to be equivalent to the passenger rates. In ACR2003 the incentive payment rates were rebased to 2002/3 prices and to ensure that train mile and farebox components provided equal amounts. A similar approach was followed for the freight payment rates.

We have substantially revised the payment rates so that they reflect current economic values of passenger and freight traffic. For passenger traffic, we use a value of 5.2 pence per passenger mile (2006-07 prices and 2009 values).¹⁶¹

The existing payment rates convert the economic benefits of additional rail passengers into a benefit per train mile using relative growth rates i.e. the economic benefit is calculated from the forecast increase in passenger miles, which is then divided by the forecast growth in train miles to give an economic benefit per train mile. This means that the resulting economic benefit per train mile encompasses the economic benefits generated not only from running additional rail services but also from background growth, better reliability and other factors not directly related to the performance of Network Rail. We consider that this could lead to Network Rail receiving greater financial benefits than warranted by the economic value of additional rail services. We have therefore recalculated the economic value of additional passenger trains based on the true economic benefit derived by operating additional services. We have retained a payment rate for additional TOC revenue so that Network Rail continues to be incentivised to assist TOCs to increase rail revenue and patronage. Consistent with previous rates, the volume incentive is based on 25% of the economic value shared equally between the train mileage and passenger revenue rates.

We have also revised the freight payment rates so that they are based on the economic value of additional freight traffic. Economic values are based on DfT guidance¹⁶². As with passenger rates, the volume incentive is based on 25% of the economic value shared equally between the train mileage and gross tonne mileage rates.

The rates are set out in table 27.1 below. There will be no geographic differentiation.

Table 27.1: Incentive payment rates – draft determinations

¹⁶¹ The economic value of passenger traffic is derived from WEBTAG Unit 3.13.2. This may be accessed at www.webtag.org.uk/webdocuments/3_Expert/13_Rail/3.13.2.htm.

¹⁶² *Sensitive Lorry Miles*, Strategic Rail Authority, May 2003. This may be accessed at www.dft.gov.uk/pgr/freight/railfreight/slmp/sensitivelorrymilesevaluatio3217.

| 2006-07 prices | Value | Baseline annual growth |
|-----------------------------------|-------|------------------------|
| Passenger | | |
| Per passenger train mile | 70p | 0.8% |
| % of additional revenue | 1.4% | 4.7% (real) |
| Freight | | |
| Per freight train mile | 102p | 2.3% |
| Per freight 1000 gross tonne mile | 92p | 1.6% |

Despite the reduction in passenger rates from those currently in place, the payment rates for both passenger and freight traffic will lead to Network Rail receiving income well in excess of the average additional costs of accommodating extra traffic (the passenger rate, for example, still exceeds the average variable charge) and therefore, in principle, this incentive ought to be powerful.

Baseline growth rates for passenger revenue have been taken from the DfT HLOS.¹⁶³ Network Rail is responsible for the industry plan to deliver the HLOS and so Network Rail forecasts have been used for passenger train miles. The HLOS does not specify freight growth forecasts and so Network Rail forecasts have been used. All Network Rail forecasts have been taken from the infrastructure cost model (ICM).

- Form of payment:** Our draft determinations said that the payment will be made to Network Rail as a lump sum cash payment at the beginning of CP5. This should strengthen the power of the incentive versus the current RAB-based approach.¹⁶⁴ The payment in the next control period (rather than annual payments in CP4) fits with both the definition of capacity outputs in the HLOSs / freight RUS and the wish to provide government with budgetary certainty during CP4.
- Level of payment:** To ensure that Network Rail's incentives are not distorted by the periodic review we intend that Network Rail should benefit from growth for a period of five years regardless of when that growth occurs. The payment will therefore be equal to five times the incremental growth in each year multiplied by the relevant incentive growth rate.

¹⁶³ See table 12.1 of *Delivering a sustainable railway*, Department for Transport, July 2007. This document may be accessed at www.dft.gov.uk/about/strategy/whitepapers/whitepapercm7176/whitepapersustainablerailway1. Values have been converted from nominal into real using our inflation assumptions.

¹⁶⁴ See chapter 19 of *Access Charges Review 2003: Final Conclusions*, Office of the Rail Regulator, December 2003. This may be accessed at www.rail-reg.gov.uk/upload/pdf/184.pdf.

27.14 The volume incentive will provide Network Rail with a potential pot of money that it can use at its own discretion to invest in the network. This should provide incentives on Network Rail's managers to accommodate additional demand due to the reputational benefits that could be expected from, for example, driving / being associated with a successful company and/or generating savings that can be used to improve the network.

Responses to our draft determinations

27.15 Network Rail welcomed the retention of the volume incentive but highlighted two main concerns with the proposed changes to the regime:

- there appeared to be an inconsistency between the proposed approach to pay the volume incentive as a lump sum at the start of CP5 described above and the proposed approach to non-capex additions to the RAB (as described in chapter 15) which suggests a gradual release of funds over CP5; and
- the baseline for growth is set at the expected level of traffic in the HLOS and freight RUS, with incentive payments occurring only for growth above this level. Network Rail has suggested that growth could be less than forecast in the HLOS and freight RUS and so decisions could be made on the assumption that there is no volume incentive.

27.16 Network Rail, ATOC and EWS suggested that the move to a cash payment rather than RAB addition might not affect incentives as much as intended, for example Network Rail suggested that it could invest against the volume incentive payment under both approaches.

27.17 ATOC raised a concern over the level of the payment and the proposed baseline. ATOC stated that payments to Network Rail could be quite small.

27.18 RFG suggested that the value of the rail freight volume incentive should be revised to reflect DfT's latest estimate of sensitive lorry miles.

Our determination

27.19 We have reviewed the timing of the payment of volume incentive and the potential inconsistency highlighted by Network Rail. On reflection, we would be concerned if making a lump sum payment at the start of CP5 impacted on affordability. We have therefore concluded that the volume incentive should only be paid in cash in the first year of the next control period if this had no impact on affordability. We do not consider that we should provide an annual addition to the RAB, as suggested by EWS, as this would lead to uncertainty about the level of payments which would need to be funded by government in CP4.

- 27.20 We have considered whether the volume incentive should be paid for growth below that forecast in the HLOS and freight RUS. We are content that Network Rail is funded and required to deliver capacity to meet the growth in the HLOS and hence has a strong incentive to do so. We therefore do not consider that an additional volume incentive payment is required for Network Rail to meet this growth.
- 27.21 We have reviewed the proposed payment rates and revised them slightly to reflect some elements of price rebasing. We are content that the rates reflect the latest published DfT values for sensitive lorry miles.
- 27.22 We are content that the volume incentive rates should be sufficient to incentivise Network Rail to accommodate traffic growth. We also note that many stakeholders, including ATOC, have suggested that growth could be much higher than forecast in the HLOS. If growth was double that assumed in the baseline then Network Rail would receive a volume incentive payment for CP4 of around £200m. We consider that this should be sufficient to incentivise Network Rail to accommodate additional growth.

Table 27.2: Incentive payment rates – determination

| 2006-07 prices | Value | Baseline annual growth |
|-----------------------------------|-------|------------------------|
| Passenger | | |
| Per passenger train mile | 69p | 0.8% |
| % of additional revenue | 1.5% | 4.7% (real) |
| Freight | | |
| Per freight train mile | 111p | 2.3% |
| Per freight 1000 gross tonne mile | 100p | 1.6% |

Efficiency benefit sharing mechanism

- 27.23 As discussed in our July 2006 consultation document, a consequence of the current franchising regime is that franchised TOCs are largely insulated from changes in Network Rail's cost efficiency within the life of a franchise. They therefore face little direct financial incentive to encourage Network Rail to improve either its expenditure decisions or its efficiency, though we recognise that there are examples of TOCs engaging on these issues.
- 27.24 Our draft determinations confirmed, following earlier consultation, that we would implement a mechanism from the start of CP4 whereby both TOCs and FOCs would share in Network Rail's outperformance of its regulatory efficiency assumptions where they demonstrably assist in that outperformance.

- 27.25 Providing this strong incentive for direct train operator engagement with Network Rail is in the long term interests of Network Rail's customers and funders. Whilst customers would benefit immediately from any payouts, funders will benefit in the longer term (i.e. from 2014 onwards) due to Network Rail's lower cost base and hence funding requirement.
- 27.26 The development of this mechanism was widely supported by the industry although both governments have had concerns over its specific design. Government support for implementing the mechanism as intended would be desirable, given that for it to have full effect for franchised train operators it requires government to waive its rights to claw back revenue received train operators, under the "clause 18.1"/schedule 9 (no net loss, no net gain) provisions in the franchise agreements. As we discuss further below, government is currently not prepared to waive its rights (at least as far as franchised train operators are concerned). Before we discuss the consultation responses we set out below the detail on the proposed mechanism.

Background

27.27 We always felt that, ideally, the detailed 'ownership' and design of the mechanism should be industry led. We therefore engaged with stakeholders extensively and asked them to agree a mechanism that balances appropriately the objectives of ensuring the mechanism is both:

- targeted on areas where train operators can bring genuine discipline to Network Rail's decision making, so that benefit shares are a legitimate reward for the effort that operators make to reduce Network Rail costs; and
- straightforward, with minimal transaction costs, and easily understood.

27.28 We set out most of the details of the intended mechanism in our February 2008 document and provided further clarification and detail in our draft determinations.

The type of efficiencies to be shared

27.29 Network Rail can potentially outperform its regulatory determination on a number of fronts, and should be encouraged to do so. Operators have the ability to assist and encourage Network Rail in this in a variety of ways, and the efficiency benefit share mechanism should ideally reflect this.

27.30 As set out in February 2008, the industry proposed to us that Network Rail should share a broad definition of outperformance and identified examples of how operators could assist Network Rail in identifying opportunities to outperform in each area.

27.31 We intend to adopt this approach. Under the mechanism, Network Rail will share outperformance on all operating, maintenance and renewals expenditure and a number of revenue elements (variable track access charges associated with additional traffic, retail and property rental income and schedule 4).

27.32 We believe that it is important that operators share only in the types of outperformance that they are able to influence and therefore that payment shares represent a legitimate reward. We will therefore review the appropriateness of this once the mechanism has been in operation for two years.

Measuring efficiencies

27.33 It is important that all parties have confidence that the measurement of outperformance used to calculate any efficiency shares is robust.

27.34 We will review Network Rail's performance against our determination each year, and this will form the basis of our assessment of the amount that Network Rail is to share under the efficiency benefit share mechanism. From the beginning of CP4, we will set out annually our decision on the outperformance to be shared under the benefit share mechanism. This will reflect our assessment of Network Rail's cumulative outperformance of our determination in the relevant areas in the control period up to the point of the assessment.

27.35 Our framework for assessing Network Rail's outperformance involves determining whether the company has delivered its required outputs. Where it has not done this, our assessment will involve assessing the extent to which the underspend is related to the failure to deliver the required outputs. It is possible that there will therefore be no efficiency benefit share payments allowed where Network Rail has not delivered required outputs.

The level of disaggregation

27.36 The mechanism will operate at the national level in the first instance, with separate schemes for England & Wales and Scotland.

27.37 Nevertheless, we would anticipate significant operator input being at the local level, for example through the local route investment review groups and local station groups. The specific administrative arrangements for the industry to decide.

27.38 We do not, however, want to rule out a more targeted (e.g. route based) benefit sharing mechanism in future when accurate local level data is available to support it. We will keep this under review.

The sharing rule

27.39 Under the mechanism, Network Rail will share 25% of relevant outperformance with all train operators. This percentage:

- represents a judgment that joint working arrangements should mean that a non-trivial proportion of cost saving initiatives implemented by Network Rail originate ultimately from train operator input, and
- should provide operators with reasonably strong financial incentives to engage with Network Rail in reducing costs while not undermining Network Rail's incentive to strive for continuous cost efficiencies.

27.40 In the interests of simplicity and minimising the potential for perverse incentives, the operator share will then be divided between operators in proportion to the variable track access charges paid. 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.

Timing of payments

27.41 For the benefit sharing mechanism to provide a real incentive to operators, we believe it is important that payments are made on an annual basis.

27.42 Operators need to realise the benefits of their engagement with Network Rail relatively quickly for the financial incentive to be meaningful. Making payments at the end of each control period, for example, would mean that the financial incentives on operators, particularly franchised TOCs, would be diluted in the early part of the control period, severely so for franchisees whose contracts end before the end of the control period.

27.43 We recognise that an annual payment mechanism does leave some risk with Network Rail in that early outperformance of efficiency targets that results in benefit share payments being made to operators may be offset by underperformance later in the control period. However, we believe that Network Rail should be able to manage this risk effectively.

27.44 Our assessment of Network Rail's efficiency performance is currently published in September each year. In CP4 we expect to produce our annual efficiency assessment on a similar timescale. This will allow any benefit share payments to operators to be paid in the November following publication of our assessment of Network Rail's efficiency for the financial year to which the payments relate.

Form of payments

27.45 Any benefit shares will be payable to operators in cash. We believe this will provide a strong incentive to operators and is administratively straightforward. We consider cash payments to be particularly important given that the total amounts of money involved in the scheme are likely to be relatively small for any particular operator in any

particular year. The cash payment basis of the mechanism is the chief concern raised by government, which we discuss further below.

Implementation

27.46 We included this mechanism in schedule 7 of track access contracts that we consulted upon in July 2008. We made the point in our draft determinations that for the incentive to be effective, it would be crucial that DfT and Transport Scotland do not claw back all the benefits received by train operators under the terms of franchise agreements.

Reviewing the mechanism

27.47 Once the mechanism has been in place for two years we will review its effectiveness and whether there is merit in altering its scope or detailed design.

Responses to our draft determinations

27.48 Network Rail and train operators gave broad support for our proposed mechanism. However, as highlighted above, DfT and Transport Scotland have both stated that whilst they both support our work to align incentives they are currently unwilling to waive the “clause 18.1”/schedule 9 (no net loss, no net gain) provisions in the franchise agreements. They do not consider that cash payments to train operators would currently represent appropriate use of industry funds. Both governments have said that they would support an alternative mechanism whereby payments would not be made in cash to train operators but instead go into a ring-fenced fund for reinvestment in the industry, at the discretion of train operators.

Our determination

27.49 We recognise that the governments have concerns about making cash payments to train operators who are, in part, supported by public funding. However we remain firmly of the view that cash payments provide the strongest possible incentive to train operators to engage with Network Rail to identify and implement efficiency initiatives. In turn this will provide greater benefits to both customers and funders over the longer term through Network Rail’s lower cost base and the corresponding funding requirement.

27.50 We are going to implement the mechanism as we have set out above and will discuss further with the two governments their concerns ahead of the first round of potential payments under the mechanism (following 2009-10). In the meantime, we hope that all operators, including franchised passenger operators will engage fully with Network Rail.

27.51 Open access passenger and freight operators are not subject to the no net loss, no net gain provisions stand to benefit immediately from the mechanism.

- 27.52 We have asked the industry to set out in more detail the procedures it will adopt to ensure commitment and minimise the risk of free-riding (i.e. some operators benefiting from the mechanism without making a proportionate input to the engagement process with Network Rail). We believe that further clarity on these procedures as well as real demonstration by the industry of partnership working and the identification of actual opportunities to improve efficiency will demonstrate the benefits of the mechanism.
- 27.53 Our efficiency benefit share mechanism does not cover outperformance in respect of enhancement projects. We understand that Network Rail and train operators both support developing an approach for this outside the periodic review process and separate to the mechanism set out here. We support Network Rail and operators developing this and we will provide support to implementing their joint proposal as appropriate.

Fine tuning the delivery of the HLOSs

- 27.54 In our advice to ministers in February 2007, we said that there would be merit in enabling the industry to 'fine-tune' the regulatory determination for Network Rail if emerging information suggests that another party could deliver HLOS outputs more efficiently. Our proposals were widely supported by industry, and we have since engaged with stakeholders to explore the practicalities in more depth. The approach to fine-tuning is discussed in chapter 4.

PART F: AFFORDABILITY OF THE HLOSs

28. Affordability of the HLOSs

Introduction

- 28.1 We made our announcements on the initial assessment of HLOS affordability on 20 December 2007^{165,166} and we provided further information in February 2008¹⁶⁷ and in our draft determinations.
- 28.2 This chapter sets out our assessment of why we have now concluded that both the England & Wales and Scotland HLOSs can be delivered for the public funds (SoFAs) available.
- 28.3 The chapter is structured as follows:
- background information on how we determined affordability;
 - an overview of DfT's financial forecasts, on which it based its HLOS, and our analysis of these forecasts;
 - an overview of Transport Scotland's financial forecasts, on which it based its HLOS, and our analysis of these forecasts;
 - the results of our affordability assessment in our draft determinations and issues raised by consultation responses;
 - a summary of how much revenue we believe Network Rail is likely to require to deliver the HLOSs; and
 - a summary of the final results of the affordability assessment.

Background and approach

- 28.4 In our advice to ministers we said that we must decide if the HLOSs can be delivered for the public funds available. In reaching this decision we said that we would collate all the relevant information and undertake our own analysis as necessary.¹⁶⁸ Broadly, our affordability calculation is based on:

¹⁶⁵ *Periodic review 2008 - likely affordability of your high level output specification, letter to DfT*, Office of Rail Regulation, 20 December 2007. This may be accessed at www.rail-reg.gov.uk/upload/pdf/pr08-hlosdif-DfT-201207.pdf.

¹⁶⁶ *Periodic review 2008 - likely affordability of your high level output specification, letter to Transport Scotland*, Office of Rail Regulation, 20 December 2007. This may be accessed at www.rail-reg.gov.uk/upload/pdf/pr08-hlosdif-TS-201207.pdf.

¹⁶⁷ *Update on the framework for setting access charges and strategic business plan assessment*, Office of Rail Regulation, February 2008. This may be accessed at www.rail-reg.gov.uk/upload/pdf/351.pdf.

¹⁶⁸ *Advice to Ministers and framework for setting access charges*, Office of Rail Regulation, February 2007. This may be accessed at www.rail-reg.gov.uk/upload/pdf/316.pdf.

- the information on franchise support costs that DfT and Transport Scotland have provided to us;
- an analysis of the risks associated with the forecasts; and
- our calculation of Network Rail's revenue requirement.

28.5 The main calls on the funds available are:

- base franchise subsidy: this is calculated as the cost of passenger services plus access charge payments to Network Rail by TOCs minus franchise revenue, before the impact of each HLOS is taken into account. Some DfT franchises are also subject to revenue sharing agreements;
- incremental franchise subsidy: this is the extra subsidy payment to franchises required to deliver each HLOS. This mainly covers additional rolling stock lease charges and related costs such as depot and stabling costs; and
- Network Rail's revenue requirement: for the purposes of assessing the affordability of the HLOSs we subtract from the gross revenue requirement the income Network Rail receives from all other sources other than access charges paid by franchised passenger train operators, or government grants in lieu of access charges.

28.6 An important influence on the calculation is how enhancement projects are assumed to be funded. DfT and Transport Scotland assumed a mix of RAB funded and 'pay as you go' (PAYG) funding in their SoFAs. In the case of RAB funding, expenditure on renewals and enhancements is capitalised (i.e. added to the RAB). It is then remunerated over time through the amortisation allowance and the allowed return. For PAYG funding each pound of capital expenditure is reflected in full in the calculation of access charges in the year it is incurred. As long as Network Rail borrows money to finance a share of its capital expenditure, which the company will do in CP4, it means that Network Rail requires less revenue for RAB funding than for a PAYG approach to funding over the short term. We have generally assumed all enhancement projects are RAB funded, although capital expenditure funded through the ring fenced investment fund is paid for on a PAYG basis.

28.7 We also need to ensure that there is consistency between the calculations carried out by government and ourselves. A significant part of the costs facing a franchised operator are the access charges paid to Network Rail. In producing their franchise subsidy forecasts DfT and Transport Scotland included estimates of these costs. In calculating Network Rail's revenue requirement for the HLOS affordability assessments we have calculated new implied access charges and hence we adjust for this in our overall assessment.

DfT's financial forecasts

28.8 DfT provided an analysis of its forecast financial position in its 'Delivering a Sustainable Railway' white paper.¹⁶⁹ DfT also provided us with detailed, commercially confidential data underpinning its financial forecasts, including:

- forecast base (before changes expected as a result of the HLOS) revenue and costs (and hence subsidies to be paid by DfT or premiums received) for each of the franchised operators;
- a risk analysis, including the forecast impact of revenue sharing arrangements for those franchise operators which have them; and
- forecast incremental franchise costs, mainly assumptions on the number of extra rolling stock vehicles required to deliver the HLOS and their leasing costs.

28.9 DfT also provided us with its underlying policy assumptions, including its assumptions on fares, where the policy on regulated fares is unchanged (broadly an RPI + 1% increase each year) and unregulated fares are assumed to rise in line with regulated fares for forecasting purposes.

28.10 Since our draft determinations DfT has confirmed that it does not wish to make any changes to its forecasts.

Our analysis of DfT's forecasts

28.11 We considered how best to assess the information provided by DfT. In principle we could have produced our own forecasts of franchise finances, but we do not believe that duplicating DfT's work is appropriate. However we do need to be assured that the forecasts provided are reasonable.

28.12 We decided to assess the base franchise forecasts against a number of criteria and then give more focus to the incremental costs, as these costs relate to key industry wide issues, for example how extra capacity should be delivered and how much it should cost.

28.13 We asked Network Rail, as part of its SBP, to set out its view on the number of extra rolling stock vehicles required to deliver the HLOS, on the basis of discussions with the industry, so that we would have an industry forecast which we could then cost.

Base franchise revenues and costs

28.14 We reviewed the information provided by DfT and assessed against our criteria of consistency, completeness and reasonableness. In terms

¹⁶⁹ *Delivering a Sustainable Railway*, DfT, July 2007. This may be accessed at www.dft.gov.uk/about/strategy/whitepapers/whitepapercm7176/whitepapersustainablerailway1.

of consistency we considered whether the forecasts used consistent internal assumptions and whether these were consistent with assumptions made elsewhere in the affordability analysis. We checked completeness in terms of whether all material items were included in the calculation and carried out checks of computational accuracy.

- 28.15 The most important aspect of the process in terms of applying our judgement was the application of a 'reasonableness' test to the forecasts. We excluded some aspects of the forecasts from this test, mainly the policy assumptions on fares. DfT sets regulated fares and hence we used the DfT assumptions. Changes in unregulated fares partly follow regulated fares but are subject to decisions by individual operators.
- 28.16 Overall, we did not see any basis for changing the DfT assumptions on base franchise revenues and costs.

Franchise revenues

- 28.17 Franchise revenues are forecast to increase by 8% per annum over CP4, which is below recent trend forecasts, but still constitutes rapid growth. The forecast revenue increases are fundamental to the affordability calculations because they inject an extra £1.6bn of annual revenue by the end of CP4 and allow a large increase in the proportion of railway costs covered by the farepayer rather than the taxpayer. But the forecasts are below those assumed by some franchise bids and hence some risk adjustment has been applied.
- 28.18 It is impossible to say with certainty whether rapid revenue growth will continue, particularly given recent economic forecasts. Revenues would be affected by a prolonged economic slowdown. However, we consider that the forecasts are reasonable and are consistent with DfT's HLOS passenger demand growth assumptions.

Franchise costs

- 28.19 We considered the different components of franchise costs: staff, other operating costs and rolling stock lease charges. This determination is setting out the level of access charges payable to Network Rail by franchisees, hence the only issue was to net out any double counting given that estimates for these were included in the franchise costs.
- 28.20 The staff and other operating costs forecasts are consistent with the forecasts of the NMF (an industry forecasting model jointly developed by DfT, Transport Scotland, ORR, Network Rail and RSSB) and appear to be reasonable. However it could be argued that the assumed small cost increases during a period of forecast significant demand growth could be challenging. We took this into account in our overall analysis (see below).

28.21 Rolling stock lease costs are a function of rolling stock numbers and lease charges per vehicle and are largely governed by existing contracts or known changes. We believe the forecasts are reasonable.

Incremental impacts

28.22 When DfT submitted its HLOS in July 2007, it estimated that at least 1300 new vehicles would be required to deliver the extra capacity. In its SBP Network Rail estimated 1519. DfT published a Rolling-Stock Plan in January 2008. This stated that “The emerging indicative number of vehicles is set out in Appendix B. The additional trains may be new vehicles or vehicles cascaded from other services.” As Appendix B of its document combined new vehicles and cascades we did not use it as the basis for our draft determinations.

28.23 In July 2008 DfT published an HLOS plan update, describing the implementation process for rolling stock changes for each TOC. The indicative numbers shown were based on the January plan.

28.24 The main reason for differences between the DfT July 2007 estimate and Network Rail’s estimate centres on the operational implications of introducing longer trains, in terms of over what part of the day longer trains will need to be run to deliver a workable timetable.

28.25 Any additional depots and stabling costs will also be a call on the SoFA. DfT had only carried out limited analysis of depot and stabling requirements at the time of the white paper and Network Rail did not include any volume/cost estimates in its SBP. We asked Network Rail to consider depots/stabling requirements in its April SBP update and it produced an analysis based on 1519 new vehicles being required (in line with its earlier estimates on rolling stock).

28.26 Network Rail’s analysis was necessarily based on a number of assumptions given the fact that few firm decisions have been taken on plans for new rolling stock. The implications of the Crossrail stabling strategy were not taken into account. Network Rail focused on south-east England where depots and stabling capacity constraints are likely to be most severe, but it also reviewed other key routes. In broad terms it concluded that new depots and stabling facilities would be needed and significant alterations would be needed to existing or proposed facilities. It estimated that the P80 costs would be around £300m, where P80 means that there is only a 20% chance that the cost estimate will be exceeded. We reviewed these estimates, accepting the uncertainty around the analysis at this stage.

28.27 Overall we concluded that Network Rail’s analysis was credible and would also be very useful in helping DfT develop its views. We take the view that the costs are somewhat overestimated and we have included £230m in our affordability calculations, as set out below.

Other issues

28.28 We noted that DfT had not assumed any additional franchise revenues from the enhancement programme. Our own estimates suggested extra revenue would be generated, although this is sensitive to assumptions on the timing of capacity increases.

Summary

28.29 In summary, our analysis of the DfT base franchise revenue and cost forecasts is that:

- the forecasts are dependent on a continuation of strong revenue growth and effective cost control by the TOCs. As such, there is a risk the outturn position will be worse than forecast. However we note that DfT has made explicit provision for downside risk in its forecasts, including possible risks to franchise revenues. We have therefore used DfT's base franchise revenue calculations in our forecast; and
- although there must be some risk that the franchise costs will be higher, when we considered the whole financial picture (e.g. the assumption on no net revenue benefits from enhancement projects), the subsidy forecasts are not unreasonable. We have therefore used DfT's base franchise cost calculations in our forecast.

28.30 For incremental franchise costs we first need to establish likely additional rolling stock requirements. DfT is currently in commercial negotiations with a number of TOCs and their negotiations will cover not only new vehicles but also cascades. DfT's best estimate of the number of new vehicles required remains 1300, but the actual number will reflect the outcomes of negotiations and further detailed work. The eventual allocation of rolling stock across the country will affect depot and stabling requirements. We cannot anticipate the outcome of these negotiations.

28.31 We believe that it is prudent to adopt the Network Rail view on additional rolling stock numbers and we have also generally adopted its view on depots and stabling requirements, subject to the assumed lower capital cost described above. Network Rail's work was based on discussions with TOCs, but is not an attempt to forecast the outcome of any commercial negotiations. We have converted this analysis of new vehicles and depot/stabling construction costs into an estimate of the impact on HLOS affordability.

28.32 As the rolling stock and depots/stabling costs involve capital expenditure we need to convert these to annual charges for our affordability calculation. Given the uncertainty involved in how these initiatives will actually be funded, we made some simple assumptions. We assumed average values for annual rolling stock lease charges and assumed that depots and stabling costs would be paid for through

a return and amortisation charge, as if RAB funded. In reality, funding may be through more sophisticated commercial deals, but we have no basis on which to forecast the impact of these.

Transport Scotland's financial forecasts

- 28.33 In July 2007 Transport Scotland provided us with commercially confidential financial forecasts covering base and incremental (due to the HLOS) costs for both Network Rail and the Scotrail franchise. These were in the form of:
- its 'rail business plan', a comprehensive summary of Scottish rail finances, including Network Rail revenue requirements, costs of major projects and franchise subsidy (including incremental rolling stock and other franchise costs); and
 - a base-year 'profit and loss' statement for the franchise demonstrating the relationship between the franchise support in the rail business plan, payments expected from the franchise to Network Rail, and franchise operating costs and revenues.
- 28.34 In April 2008 Transport Scotland updated its forecasts to reflect new information, including the recently extended Scotrail franchise and information on its major projects.
- 28.35 Since our draft determinations Transport Scotland has confirmed that it does not wish to make any further changes to its forecasts.

Our analysis of Transport Scotland's financial forecasts

- 28.36 The franchise financial picture is simpler in Scotland than in England & Wales, with Scotrail the only call on Transport Scotland's franchise support. As in the case of England & Wales, we reviewed the revised franchise costs supplied by Transport Scotland against our criteria of consistency, completeness and reasonableness, focusing on the revised forecasts.
- 28.37 We compared the franchise subsidy forecast assumed in the rail business plan with the base year franchise economics, in order to satisfy ourselves that the forecast subsidy was reasonable. We concluded that, based on likely extrapolation of current franchise costs and revenues, the franchise support forecast looked reasonable, and we have used Transport Scotland's base franchise subsidy forecast in our calculations.
- 28.38 We reviewed the incremental franchise costs which were based on an assumption that new vehicles would be needed in CP4.
- 28.39 We concluded that the forecasts were reasonable and have used them in our affordability assessment.

Our draft determinations on affordability and consultation responses

- 28.40 In our draft determinations we concluded that both the England & Wales and Scotland HLOSs were affordable. Our affordability assessment showed that, for England & Wales, there was a surplus for the control period of £1.3bn (that is, the SoFA for CP5 exceeded the cost of delivering the Secretary of State's specification by this amount). The corresponding figure for Scotland was a surplus of £78m. The England & Wales HLOS was affordable for the control period as a whole and there were no deficits. The Scotland HLOS was affordable for the control period as a whole although there were surpluses in the first two years and deficits in the three subsequent years.
- 28.41 Following the draft determinations, Transport Scotland wrote to us proposing that, since the draft determinations were affordable for the control period as a whole, it would like adjustments to be made to Network Rail's revenue requirements in specific years.
- 28.42 We also explained in our draft determinations that we had carried out a sensitivity test of the impact of higher than previously expected inflation and concluded that the England and Wales surplus may fall to £800m.
- 28.43 In its consultation response the DfT said that inflation may be higher than we had modelled in our sensitivity test and this could significantly reduce the surplus.

Determination of Network Rail's revenue requirement

- 28.44 We have updated our affordability calculations to reflect our determination on Network Rail's revenue requirement.
- 28.45 As described in the previous parts of this document, Network Rail's revenue requirement includes the schemes which deliver the England & Wales HLOS capacity and performance specifications and the further schemes we have included in this determination as described in chapter 9. In the case of Scotland, Network Rail's revenue requirement does not include any of the Tier 3 outputs beyond development funding. The Scotland HLOS Tier 3 represents further outputs that Scottish Ministers may wish to implement.
- 28.46 For the purposes of the affordability calculation we need to take account of third party income, which is income that Network Rail receives from sources other than TOCs' access charges (or government grants in lieu of access charges).
- 28.47 Tables 28.1 and 28.2 summarise the calculations of the revenue requirements in England & Wales and Scotland necessary to deliver the HLOSs.

Table 28.1: Network Rail's CP4 revenue requirement to deliver the HLOS – England & Wales

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total |
|--|--------------|--------------|--------------|--------------|--------------|---------------|
| Gross revenue requirement | 4,764 | 4,805 | 4,836 | 4,817 | 4,806 | 24,028 |
| Less schedule 4 and 8 expenditure | (159) | (142) | (144) | (115) | (109) | (669) |
| Less third party income | (262) | (264) | (290) | (320) | (333) | (1,469) |
| Revenue requirement to deliver the HLOS | 4,343 | 4,400 | 4,402 | 4,382 | 4,364 | 21,890 |

Table 28.2: Network Rail's CP4 revenue requirement to deliver the HLOS – Scotland

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total |
|--|------------|------------|------------|------------|------------|--------------|
| Gross revenue requirement | 536 | 544 | 545 | 540 | 534 | 2,699 |
| Less schedule 4 and 8 expenditure | (10) | (9) | (9) | (7) | (7) | (43) |
| Less third party income | (21) | (21) | (22) | (22) | (21) | (108) |
| Revenue requirement to deliver the HLOS | 505 | 513 | 514 | 511 | 506 | 2,549 |

Results of our affordability assessment

28.48 Tables 28.3 and 28.4 summarise the figures used in our calculations. We have made assessments for England & Wales and Scotland as follows:

- starting from the SoFA we subtracted the forecast base franchise support payments;
- we then subtracted the incremental franchise support payments required to deliver the HLOSs;
- to calculate the funds available to Network Rail we then added back the payments assumed (in DfT and Transport Scotland SoFA calculations) to be made by franchised operators to Network Rail; and

- the resulting total was then compared to our calculation of Network Rail's revenue requirement to deliver the HLOS, in order to calculate a 'surplus' or 'deficit' of funds.

Table 28.3: Results of the affordability calculation for CP4 – England & Wales

| £m (2006-07 prices) | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | Total |
|--|--------------|--------------|--------------|--------------|--------------|---------------|
| SoFA | 2,888 | 2,700 | 2,706 | 2,567 | 2,444 | 13,305 |
| Less base franchise support payments | (1,288) | (1,036) | (727) | (501) | (220) | (3,772) |
| Less incremental franchise support payments* | (208) | (224) | (262) | (256) | (253) | (1,199) |
| Add back franchise payments to Network Rail (as assumed in the SoFA) | 2,864 | 2,880 | 2,888 | 2,891 | 2,895 | 14,418 |
| Funds available for Network Rail | 4,256 | 4,320 | 4,605 | 4,703 | 4,866 | 22,749 |
| Less Network Rail revenue requirement to deliver the HLOS** | 4,343 | 4,400 | 4,402 | 4,382 | 4,364 | 21,890 |
| Surplus/(deficit) | (87) | (80) | 203 | 321 | 502 | 859 |

Notes: * Includes our estimate of additional depots and stabling costs (which are assumed to be capitalised) and rolling stock. ** Gross revenue requirement less income from sources other than franchised train operator access charges or network grant (e.g. property income and access charges paid by freight operators).

Table 28.4: Results of the affordability calculation for CP4 – Scotland

| £m (2006-07 prices) | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | Total |
|---|------------|------------|------------|------------|------------|--------------|
| SoFA | 759 | 826 | 676 | 668 | 673 | 3,600 |
| Less base franchise support payments | (317) | (330) | (325) | (333) | (340) | (1,635) |
| Less incremental franchise support payments | (4) | (11) | (34) | (27) | (27) | (103) |

| | | | | | | |
|--|------------|------------|-------------|-------------|-------------|--------------|
| Add back franchise payments to Network Rail (as assumed in the SoFA) | 150 | 150 | 150 | 150 | 150 | 750 |
| Funds available for Network Rail | 588 | 645 | 467 | 458 | 456 | 2,612 |
| Less Network Rail revenue requirement to deliver the HLOS* | 505 | 513 | 514 | 511 | 506 | 2,549 |
| Surplus/(deficit) | 83 | 132 | (47) | (53) | (50) | 64 |

Note: * Gross revenue requirement less income from sources other than franchised train operator access charges or network grant (e.g. property income and access charges paid by freight operators).

28.49 The final calculations show that both HLOSs are affordable for the control period as a whole, but that there is a small deficit in the first two years for DfT and for the last three years for Transport Scotland. We have taken into account Transport Scotland's request to change the revenue Network Rail receives in specific years by reprofiling network grant as described in Chapter 20.

28.50 Both DfT and Transport Scotland are aware of the annual deficits and that these are outweighed by surpluses in other years.

28.51 The changes in the affordability outturn for each year since the draft determinations reflect the net effect of a wide-range of issues, including the impact of adding deferred expenditure from CP3, changes to the efficiency profiles, an increase in the allowed rate of return, and increases in expenditure allowances in some areas.

28.52 Changes to assumptions on future inflation also affect the position. With the recent events in the financial markets, and the uncertainty over their impact on the wider economy, there have been revisions to projected RPI, particularly for 2009-10.

28.53 In conclusion, our role is to decide if overall the HLOSs are affordable. After a careful review of the position in the light of our duties we have concluded that the overall CP4 position is the critical consideration. We therefore conclude that both the HLOSs are affordable.

Testing affordability in England & Wales with an alternative inflation forecast

28.54 As noted above, both DfT and Transport Scotland face financial risk if the level of inflation differs from that assumed at the time they provided their SoFAs. DfT published a nominal price SoFA but with an accompanying inflation forecast, while Transport Scotland published its SoFA in real 2006-07 prices. In converting DfT's nominal SoFA into real terms for our affordability assessment we have used the same assumptions that DfT used (2.75% per annum).

28.55 We have taken into account the forecasts of higher inflation for 2008-09, and then the forecast fall from 2009-10 onwards. We have assumed that inflation returns to the long run trend originally assumed by DfT from 2010-11.

Table 28.5: Inflation forecasts (RPI) for CP4

| % | 2007-08 | 2008-09 | CP4 | | | | |
|---------------------|---------|---------|---------|---------|---------|---------|---------|
| | | | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
| DfT HLOS assumption | 3.50 | 2.75 | 2.75 | 2.75 | 2.75 | 2.75 | 2.75 |
| Our assumption | 4.28* | 4.70 | 2.30 | 2.75 | 2.75 | 2.75 | 2.75 |

Note: *Actual (November 2006 to November 2007 RPI).

28.56 In England & Wales, applying our assumptions on inflation reduces the surplus funds available from £859m to around £400m. On this basis, we conclude that the affordability assessment is robust to our updated inflation forecast for CP4.

28.57 Applying an equivalent sensitivity test to the figures for Scotland (assuming a similar expectation of inflation to England & Wales at the time of HLOS publication) reduces the Scottish surplus from £64m to £23m. Therefore in Scotland too we conclude that the affordability assumption is robust to the current inflation forecast.

**PART G:
IMPLEMENTATION & HOLDING
NETWORK RAIL TO ACCOUNT**

29. Implementation

Introduction

- 29.1 This chapter sets out how we implement our PR08 determinations into track and station access contracts. This follows the process set out in Schedule 4A of the Railways Act 1993.
- 29.2 The chapter provides an overview of:
- how the statutory implementation process works;
 - which agreements are within the scope of these changes following the arrangements specified in the review initiation notice (served on 28 February 2007); and
 - the process for identifying relevant changes to contracts to give effect to these determinations.
- 29.3 It also sets out the other aspects of the regulatory (i.e. Network Rail's network licence) and contractual framework (i.e. part G of the network code) that are being changed through different mechanisms but as part of the review.

Access charges review notices

- 29.4 PR08 is an access charges review under Schedule 4A to the Railways Act 1993. The start of the formal phase was triggered when we issued the review initiation notices on 28 February 2007.¹⁷⁰ It affects both track and station access agreements.
- 29.5 This document sets out our determination, and reasons for reaching it. The determination will be incorporated into each review notice.
- 29.6 The implementation process requires us to issue a series of notices:
- the review notices;
 - the notices of agreement; and
 - the review implementation notices.
- 29.7 A review notice initiates the implementation phase of an access charges review and must:
- state our conclusions and the reasons why we have reached those conclusions which will be done by incorporating this determination by reference;

¹⁷⁰ *Review initiation notice*, Office of Rail Regulation, February 2007. This may be accessed at www.rail-reg.gov.uk/upload/pdf/PR08_note-of-proposal.pdf.

- specify the changes which we propose to make to any access agreements for or in connection with giving effect to those conclusions; and
 - state the date on which we propose that each of those changes should come into operation.
- 29.8 Consistent with previous review notices it will also include a provision providing that if we approve amendments to an access agreement after we have served the review notice then those later amendments will have priority if there is a conflict with the changes specified in our review notice.
- 29.9 We intend to issue the review notices on 18 December 2008.
- 29.10 We will specify a period of not less than six weeks from the date of publication of a review notice in which Network Rail¹⁷¹ has an opportunity to object to any of the proposed changes. If we receive such an objection, we may issue a new review notice or make a reference to the Competition Commission. Should we issue a new review notice, this stage of the process begins again, with Network Rail having a further period of not less than six weeks to make any objections to the new notice.
- 29.11 If we receive no relevant objections, a notice of agreement must be published and served on beneficiaries who may, if they wish, give notice of termination of their access agreements. Any such notice must be given within 28 days of receiving the notice of agreement.
- 29.12 If no termination notice is given, a review implementation notice will be published. It must state that our determination is to be implemented as proposed in the review notice, and set out again the relevant changes to access agreements and the date on which the changes take effect. Through this process, the changes are implemented directly into the track and station access contracts specified in the review notice.
- 29.13 1 April 2009 is our intended date of implementation of the PR08 determination. We will send separate review notices containing revised schedules 4, 7 and 8 of the track access contract to each affected beneficiary and these will include operator-specific information (e.g. payment rates and benchmarks in schedule 8 – the performance regime), as well as any appropriate bespoke arrangements.

Our timetable

29.14 Our intended timetable is shown in table 29.1.¹⁷²

¹⁷¹ As well as any party whom we consider ought to be given a copy of the review notice and has 'an estate in, or right over, the railway facility or network installation to which the access agreement relates'.

¹⁷² This timetable assumes no objections from Network Rail.

Table 29.1: Key dates for the implementation process¹⁷³

| Milestone | Date |
|---------------------------------------|------------------|
| Issue review notice | 18 December 2008 |
| Deadline for objections | 5 February 2009 |
| Issue notice of agreement | 9 February 2009 |
| Issue review implementation notice | 11 March 2009 |
| Implementation of PR08 determinations | 1 April 2009 |

Changes to access contracts

- 29.15 The review will lead to changes to various aspects of the access agreements and the network code for passenger, freight and station operators and station users.
- 29.16 Following the publication of our draft determinations, on 18 July 2008 we consulted in respect of changes to schedules 7 and 8 to give effect to our determination. We have considered all of these consultation responses carefully and we have made refinements, where we consider that these consultation responses have required them.
- 29.17 We are considering whether any changes to the drafting to give effect to this determination should be the subject of further focussed consultation (for example, we shared a revised schedule 8 with freight operators on 24 October 2008).
- 29.18 As we explain in chapter 26, the changes to schedule 4 which will be included in the review notice have been taken forward separately. Associated changes to part G of the network code will come into effect at the same time but these will be made via the C8 process in the network code.
- 29.19 We recognise that, as at previous reviews, specific agreements have some bespoke features rather than all following the template model contract schedules 4, 7 and 8. This will again require a set of modified changes specific to particular agreements. We are working with Network Rail to ensure that we have identified these bespoke arrangements and will liaise with affected operators if necessary. If any operator has a specific query or concern on this we are happy to discuss this with them in the next few weeks.

¹⁷³ Assuming no reference to the Competition Commission or revisions to the review notice.

Licence modifications

- 29.20 As we explain in Chapter 4, we are also proposing a suite of changes to Network Rail's network licence.
- 29.21 We will conclude our thinking on these modifications in December 2008 and will then undertake the statutory consultation required so that changes can come into effect for 1 April 2009. We expect that prior to concluding our thinking that we will need to engage with relevant stakeholders about certain modifications and will consider the most appropriate way to do so.

Dealing with a Competition Commission referral and "rollover"

- 29.22 On 23 April 2008 we issued a consultation letter to the industry which proposed that Network Rail and each franchised passenger train operator should enter into a supplemental agreement to amend their existing track access agreement.^{174, 175} The amendment provided for the contents of any review notice served by us when implementing PR08 to have effect in franchised passenger train operators' track access agreement from the implementation date (1 April 2009) regardless of whether the implementation process is then delayed, as a result of Network Rail exercising its statutory right to object to the notice. We have published a general approval wording to allow the changes to the track access agreements to be implemented¹⁷⁶.
- 29.23 This change to track access agreements does not affect either Network Rail's or train operators' ability to make submissions to the Competition Commission in the event of a reference. We have discussed this with the Competition Commission to make sure they support our approach.
- 29.24 Our approach means that the CP4 arrangements contained in this determination would be introduced, as opposed to the alternative option of rolling forward based on current arrangements. We do not believe that the alternative of simply rolling over the existing access charges beyond 1 April 2009 would be suitable because:

¹⁷⁴ *Periodic Review 2008 implementation*, Office of Rail Regulation, April 2008. This may be accessed at www.rail-reg.gov.uk/upload/pdf/pr08-implementationlet-230408.pdf.

¹⁷⁵ Network Rail and each affected train operator have a track access contract approved by us. Section 22 of the Railways Act 1993 provides for any agreed amendments to be submitted to us for approval (otherwise these are void). We are proposing to provide text that will form an agreed amendment for general approval and anticipate this then being agreed simultaneously by Network Rail and each of the franchised passenger train operators.

¹⁷⁶ The general approval wording may be accessed at www.rail-reg.gov.uk/server/show/nav.180

- charges in CP3 were profiled, and there is no reason to suppose that the charges payable for the final year relate logically to the appropriate revenue which Network Rail should receive from 1 April 2009 onwards; and
- charges set for CP3 relate to the delivery of outputs specified in the Access Charges Review 2003. Network Rail should be committed to the new outputs for CP4, and we believe that implementation of the review conclusions should, in principle, proceed whilst the Competition Commission conducts its investigation in parallel.

29.25 If PR08 is not implemented on 1 April 2009 because Network Rail objects to our review notice there would be 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.

29.26 As the vast majority of provisions that time expire are found in franchised passenger operator track access agreements, we only proposed that the changes be made in these contracts and not in those of freight or open access passenger operators. Both governments have indicated that this would be covered by 'clause 18.1'.¹⁷⁷ However, certain freight operators indicated that they would also be interested in entering into similar arrangements.

¹⁷⁷ Under 'clause 18.1' of their franchise contracts (Schedule 9.1 in the new model agreement), franchised passenger train operators are held financially neutral to changes in the level and structure of access charges resulting from access charges reviews.

30. Holding Network Rail to account

Introduction

- 30.1 This determination, in the context of the network licence, establishes a range of obligations on Network Rail.
- 30.2 One of our main responsibilities following completion of the review will be to provide assurance to Network Rail's customer and funders by monitoring how well Network Rail meets those obligations and, if necessary, by taking action to enforce them.
- 30.3 The continuing development and maturing both of the privatised rail industry and of Network Rail as an organisation would itself call for us to review our approach to monitoring as we approach a new control period. This need is made greater by the significant change in the nature of the obligations Network Rail is being asked to take on. Alongside further improvements which will take the core parameters of safety and performance to their highest levels on record there will be a major programme of enhancement works to increase network capacity and capability.
- 30.4 A further key objective of our monitoring is to enable us to provide objective assessments of Network Rail's achievement and performance to its members, funders, operators, rail users and other stakeholders.

Monitoring

- 30.5 Our monitoring will focus primarily on the following issues:
- whether the industry is on course to deliver the HLOS safety requirement;
 - whether Network Rail is delivering the other top level regulated outputs;
 - whether Network Rail is on course to deliver the programme of works to support delivery of the HLOS capacity specifications, and the other enhancements being funded under this determination;
 - whether Network Rail is managing its assets in line with the policies and activity programmes on which this determination is based;
 - whether Network Rail is achieving the expected efficiencies in operating, maintenance, renewal and enhancement; and
 - whether Network Rail is operating within the financial boundaries set by our determination.
- 30.6 We will carry out a certain amount of monitoring of delivery of other local (disaggregated) customer reasonable requirements (CRRs) but

this will not extend to every CRR defined by the CP4 delivery plan. We will expect operators and other stakeholders to draw matters to our notice if they wish them to receive regulatory attention.

- 30.7 We will seek to minimise the regulatory burden on Network Rail by using the information they already employ for their own purposes wherever possible. We will not monitor more frequently than necessary, and we will monitor different measures with different frequencies.
- 30.8 We will seek to make more use of regional data where appropriate to understand variations across the network. Such benchmarking provides a powerful methodology for understanding and tackling performance issues.
- 30.9 We will continue to use independent reporters to audit and provide expert commentary on the information we receive from Network Rail. The current reporter contracts expire in 2009 and we are reviewing the terms of reference before we tender for reporters for CP4 to ensure that these cover the critical areas going forward in sufficient depth.

Safety

- 30.10 We expect to monitor progress with the reduction in safety risk annually, and we are working with the industry to agree how this can best be done. Full runs of the RSSB's Safety Risk Model, which is the definitive source of risk against which the HLOS specification is to be delivered, will be carried out at the start and end of CP4 and at one intermediate point, currently planned for September 2011.

Other top level regulated outputs

- 30.11 We will monitor delivery of the top-level train performance and network availability requirements regularly to ensure that Network Rail is on course to deliver against the year-by-year trajectories. In both cases we will also monitor lower-level diagnostic indicators, including the new suite of possessions KPIs which the industry has been developing, so that we understand the reasons for trends in the top level figures.
- 30.12 We will monitor average station condition annually through Network Rail's annual return, as this measure changes only slowly.

Capacity and other enhancements

- 30.13 We have had extensive discussions with Network Rail and others to establish how the many enhancement projects funded through this determination are best described in the CP4 delivery plan so that it is made quite clear what Network Rail is committed to deliver and what the key milestones are in each case. The delivery plan will set these out and will provide a key framework for monitoring progress and delivery.

- 30.14 We will put robust monitoring arrangements in place, including use of independent reporters, to provide assurance on progress with enhancement schemes as they proceed so that any emerging problems can be identified and addressed at an early stage.
- 30.15 We are beginning to monitor this area before the start of CP4. Network Rail faces a considerable challenge in 2009-10 to develop its overall delivery capabilities, to achieve the planned levels of renewals and to reach the relevant milestones in its enhancement programme, and it must enter CP4 well placed to succeed.

Asset management and sustainability

- 30.16 As Network Rail's asset management regime matures it is reasonable to expect it to be able to plan its future workload with increasing precision and robustness. This determination is essentially based (with the exception of certain civil engineering activity) on Network Rail's own projected activity volumes. These, in turn, are based on its defined asset policies, and are those it currently believes are necessary to manage the network on a sustainable long-term basis.
- 30.17 We will monitor Network Rail's asset management using a dashboard of condition and performance indicators including targets that Network Rail will include in its CP4 delivery plan. We will also monitor the levels of renewals activity and compare them with the levels on which this determination is based. More details of the indicators and trajectories were presented in chapter 4.
- 30.18 If asset condition falls materially below the trajectories in the delivery plan we will call on Network Rail to demonstrate clearly that it is nonetheless complying with its asset management licence obligations. We will use our discretion in investigating variances between actual and planned activity volumes; if we see significant cumulative variances emerging we will expect Network Rail to be able to provide a full explanation and to demonstrate clearly to us that it is managing the assets efficiently on a sustainable basis and acting in compliance with its network licence.

Finance and efficiency

- 30.19 We will continue to monitor Network Rail's achievement of greater efficiencies in operating expenditure, maintenance and renewals. We will assess the company's performance formally on an annual basis. This will involve assessing progress both in achieving unit cost and scope efficiencies and in rolling out the unit cost reporting framework.
- 30.20 The change in our approach to adding capital expenditure to the RAB (see chapter (15)) will require a change in our monitoring of renewals. In particular, in CP4 we will, at the end of each financial year, make an assessment of the extent to which any overspend on renewals has

been incurred efficiently. This will determine whether all of that expenditure will be added to the RAB.

- 30.21 The changes to the financial framework for Network Rail will also require a change in our monitoring of its financial position. In particular, Network Rail will be required to publish and to provide to us actual and projected annual key financial ratios for the whole control period (see chapter 17).

Enforcement

- 30.22 If Network Rail is failing, or is likely to fail, to meet one or more of its obligations derived from this determination we will consider whether to take enforcement action.
- 30.23 In its response to our draft determinations, Network Rail sought clarification about our approach if it should be failing to meet a local (disaggregated) output commitment in its delivery plan. We confirm that in this event we will take into account whether the process of disaggregation has made due allowance for the greater degree of uncertainty associated with local output projections.
- 30.24 This is most relevant to train performance commitments. If the disaggregated commitments in the delivery plan were to sum exactly to a top-level regulatory obligation we would expect to permit a degree of tolerance around the disaggregated numbers before considering regulatory intervention.
- 30.25 A full description of our enforcement policy which explains the circumstances under which we would take action, and the nature of the action we can take, is available on our website.¹⁷⁸

Monitoring publications

- 30.26 We will continue to publish full assessments of Network Rail's performance annually, and shorter focussed assessments quarterly. We will review the form and content of our publications from time to time to ensure that they are achieving our objective of communicating these matters effectively.

¹⁷⁸ *Economic enforcement policy and penalties statement*, Office of Rail Regulation, April 2006. This may be accessed at www.rail-reg.gov.uk/upload/pdf/287a.pdf.

Annex A: List of respondents to our draft determinations

1. We had 115 responses to our draft determinations document that we published on 5 June 2008.
2. Responses were received from:
 - Arriva
 - ATOC
 - CBI
 - Centro
 - Chiltern Railways
 - Devon County Council
 - DfT
 - EWS
 - First Capital Connect
 - First Great Western
 - First Group
 - Freight Transport Association
 - Freightliner
 - Govia
 - Greater Manchester PTE
 - HSBC Rail
 - London Travelwatch
 - Merseytravel
 - West Yorkshire PTE
 - National Express
 - Network Rail
 - Northern Rail
 - Passenger Focus
 - PTEG
 - Railway Industry Association
 - Rail Freight Group
 - RMT
 - Stagecoach Group
 - SW Regional Assembly
 - Transport for London
 - Transport Scotland
 - TSSA
 - UIC
 - Virgin Trains
 - Wandsworth Council
 - Welsh Assembly Government
 - West of England Partnership
3. We also received a number of responses that focussed on specific enhancement schemes.

General enhancements

- Campaign for better transport
- East London Line group
- East Sussex County Council
- Merseyrail
- North West Regional Development Agency
- SE England Regional Transport Board
- South Yorkshire PTE

- Travelwatch South West
- West Anglia Routes Group

Gatwick Airport

- Board of airline representatives (UK)
- Cadia
- Gatcom
- Gatwick Airport Ltd
- Gatwick Diamond
- Mid-Sussex District Council
- Mole Valley District Council
- Reigate & Banstead Borough Council

- West Midlands Rail Forum
- Worcester City Council

- SEEDA
- Surrey County Council
- Sussex Enterprise
- Tandridge District Council
- Virgin Atlantic
- West Sussex County Council
- West Sussex Economic Partnership

Nottingham Station/East Midlands

- Derby City Council
- East Midlands Regional Assembly
- Peterborough-Ely-Norwich Rail Users
- Harborough Rail Users
- Nottingham City Council

- Nottinghamshire County Council
- Parliamentary all-party Midland Main Line group
- Transport & Travel Research Ltd
- Travelwatch East Midlands

Swindon – Kemble

- Bishop of Gloucester
- Blaenau Gwent County Borough Council
- Cainscross Parish Council
- Churchdown Parish Council
- Clare Short MP
- Coaley Junction Action Committee
- Cotswold District Council
- County of Herefordshire District Council
- EWS
- Forest of Dean District Council

- Geoffrey Clifton-Brown MP
- Gloucester City Council
- Gloucestershire County Council
- Gloucestershire First
- Gloucestershire Rural Advisory Panel
- Leonard Stanley Parish Council
- Mark Harper MP
- Martin Horwood MP
- Max Comfort
- Monmouthshire County Council
- North Wiltshire District Council
- First Great Western

- Doug Naysmith MP
- Cardiff Council
- Parmjit Dhanda MP
- Purton Parish Council
- Quedgeley Parish Council
- Rodborough Parish Council
- Somerford Keynes Parish Council
- South East Wales Transport Alliance
- Stephen Williams MP
- Stroud District Council
- Stroud Town Council
- Swindon Borough Council
- Tewkesbury Borough Council
- Warwickshire County Council
- Wiltshire County Council

4. All have been published on the ORR website.¹⁷⁹
5. In addition to the responses we have listed here, we received a number of other letters in support of various enhancement schemes. They have all been considered but as they were not formal responses to our draft determinations they are not included in this list or published on our website.

¹⁷⁹ Consultation responses may be accessed at www.rail-reg.gov.uk/server/show/ConWebDoc.9196

Annex B: Specific objectives for PR08

Our specific objectives for the Periodic Review 2008 (PR08) are:

- To set Network Rail's access charges such that they are:
 - So far as practicable, cost reflective and therefore provide good signals to users and funders; and
 - Neither higher nor lower than they need to be to enable the high-level outputs to be delivered on an efficient and sustainable basis, and to provide value for money.
- To set Network Rail's outputs:
 - With improved definition (e.g. capability, availability, reliability), to focus Network Rail planning/management, and to facilitate measurement of outcomes;
 - So that they are targeted on what users and funders want from the railway and, wherever practicable, are based on final outputs rather than inputs; and
 - On a forward-looking basis, with a trajectory set in the short, medium and long term, to an appropriate level of disaggregation that challenges Network Rail to better understand the drivers of good performance in all time frames.
- To improve incentives, to:
 - Deliver continuous improvement in operations and maintenance and renewal/enhancement procurement efficiency;
 - Optimise cost/quality trade-offs, based on evidence of what railway users value;
 - Balance outputs in different time frames (e.g. performance in the short and longer term);
 - Challenge Network Rail to improve its knowledge/understanding of assets, especially its ability to predict the impact of changing patterns of usage and ways of working to optimise the extent/cost of accommodating forecast/emerging demand;
 - Develop Network Rail's planning framework and asset knowledge; and
 - Promote continuous improvement in health and safety.

Annex C: Copy of notice for Network Rail's CP4 delivery plan

30 October 2008

Ms Hazel Walker
Group Company Secretary
Network Rail Infrastructure Limited
Kings Place
90 York Way
London
N1 9AG

Dear Hazel,

Notice for the Network Rail 2009 business plan; the delivery plan for CP4

1. This notice discharges our obligation under condition 7.4.2(b) of Network Rail's licence following consultation with Network Rail. We expect our review of Network Rail's network licence to mean that a revised version will come into effect on 1 April 2009. If that occurs, from that date any reference in this notice to a condition of the current licence shall be read by reference to its equivalent successor in the revised network licence.

Purpose of the delivery plan

2. The main purposes of the CP4 delivery plan are these:
- To set out what Network Rail must deliver over the five year period 2009-14 so that train operators, funders and stakeholders have clarity on Network Rail's planned outputs. Committed outputs, which must comply with the requirements of our PR08 determination ("determination"), are fixed for the five year period unless amended through the relevant change control process (as described in chapter 4 of our determination). The plan may also contain details of Network Rail's objectives in other areas and aspirational objectives, which the company is free to change (although it should record where it has made changes); and
 - To set out Network Rail's planned initiatives, activity volumes and expenditure to deliver the outputs, over the five year period, with milestones where relevant. These should be updated each year where material changes have occurred.
3. The plan will provide a basis against which we will monitor whether Network Rail is on course to deliver its output commitments.



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Structure and timing

4. The plan is to be in two parts. Part 1 is to include full details of planned outputs, and milestones for enhancement projects. Part 2 is to include planned initiatives, activity volumes, expenditure and other milestones. Route plans for Network Rail's 26 strategic routes should also be published.
5. Both parts of the plan must be consistent with our determination.
6. Network Rail, having consulted its customers and funders, must provide part 1 of the plan by 27 February 2009 and part 2 by 31 March 2009. Both parts should, where relevant, have separate sections for Scotland. By 31 March 2009 both parts of the plan must be placed on Network Rail's website.
7. Network Rail must record on its website any changes made to part 1 of the plan through the change control process (as described in chapter 4 of our determination), with a clear audit trail showing how the change was agreed or decided. It must include any annual update of part 2 on its website.

Information to be included in the CP4 delivery plan: part 1

8. The delivery plan must clearly set out the outputs which Network Rail will deliver including:
 - (i) safety: the High Level Output Specification (HLOS) targets for passengers and workers (which Network Rail will contribute to meeting, as described in part 2);
 - (ii) reliability of train performance: trajectories both for the top-level metrics where our determination sets specific requirements and for individual passenger and freight operators where we require Network Rail to define them after discussion with the operators;
 - (iii) enhancement schemes: details of clear outputs, with delivery dates, for Network Rail's enhancement schemes. These include all schemes required to comply with our determination and any other major planned schemes. If outputs to be delivered by the application of specific ring-fenced funds are not fully defined when the plan is published, it must describe the process by which they will be defined. Network Rail must demonstrate that the plan will, making reasonable assumptions about rolling stock provision, deliver the capacity specifications in Tables A4 and A5 of the England & Wales HLOS. Milestones for enhancement projects should be included at a sufficient level

of detail for us to monitor whether the outputs are likely to be delivered in the planned timescales. Planned expenditure profiles should be included for all enhancement projects;

- (iv) network capability: confirmation that Network Rail will maintain network capability in compliance with our determination;
- (v) network availability: trajectories compliant with our determination;
- (vi) station condition: confirmation that Network Rail will maintain station condition in compliance with our determination; and
- (vii) depots: the trajectory for depot condition required by our determination but which is left to Network Rail to define.

9. The Plan may contain objectives in other areas, including aspirational objectives at Network Rail's discretion.

10. If Network Rail receives additional funding to deliver further outputs during CP4, either through the investment framework or through other funding routes, the plan should be amended to reflect these additional commitments.

Information to be included in the CP4 delivery plan: part 2

11. The plan must describe the planned initiatives, activity volumes and expenditure to deliver the outputs described in part 1.

12. Specifically Network Rail must show:

- the actions it will take to ensure that where it will undertake major or novel initiatives, which have a potential impact on safety, in order to deliver improvements in capacity, performance or efficiency, it has fully identified the safety risks involved and can develop and apply appropriate risk control measures;
- details of the plans to roll out the 'seven day railway' concept on priority routes and how these contribute to attaining the network availability trajectories;
- for plans to deliver the station condition requirements, planned expenditure by station facility owner and strategic route, for both national stations improvement programme (NSIP) expenditure and total expenditure;

- the approach taken to address EU interoperability requirements in working up enhancement schemes; and
- for asset serviceability and sustainability: the condition trajectories and volume renewal plans Network Rail sets for the principal asset groups including (but not limited to) those listed in Table 4.7 of our determination.

13. The plan must also contain:

- Network Rail's assumptions about future demand for both passenger and freight services;
- forecast expenditure on operating, maintaining, renewing and enhancing the network by category and by year. We expect this to be at a similar level of detail to that in the strategic business plan, with operating expenditure disaggregated to identify material items. Equivalent income data should be included. Where relevant (mainly for maintenance and renewals) we expect categories to align with those in the Infrastructure Cost Model;
- disaggregated information on enhancements, renewal volumes and expenditure on a strategic route basis to provide a comparison between routes and show how activity plans affect outputs at route level.
- Network Rail's plans to improve efficiency in the business, including plans to reduce unit costs.

14. It must describe the initiatives Network Rail is taking and will take to ensure it has the capability to deliver the plan, with particular focus on the capital programme, in a form and with sufficient detail to allow us to monitor progress.

15. It must contain specific objectives and targets to improve Network Rail's environmental performance and details on how they will be delivered.


16. It must be in a format which will enable ORR, train operators and funders to compare like for like over time.

17. At the time of this notice we are discussing with Network Rail the extent to which the further financial data we require is commercially sensitive and hence could be published. We will write separately with our requirements in due course, which will form part of this notice.

18. The plan, including our requirements for financial data, will set the parameters against which we will agree the form and content of the annual return.

Yours sincerely

Michael Lee


Michael Lee

Annex D: Train performance

Introduction

1. In chapter 4 we described the train performance targets which we are setting for the next control period. In this annex we set out our assessment of Network Rail's plans to improve performance and explain our determination.
2. In each section (where appropriate) we have described the analysis we undertook for the draft determination, summarised consultation responses, and then set out our final decision.
3. Three measures of performance are being considered.
 - PPM (Public Performance Measure): the percentage of trains arriving at their destination within 10 minutes of the time shown on the published timetable for long distance services and within 5 minutes for regional services and London and south-east services. Full or partial cancellations are treated as trains not arriving on time;
 - Significant lateness: a train is significantly late if it arrives 30 or more minutes later than the published timetable or is partly or fully cancelled; and
 - Network Rail delay minutes: the amount of delay suffered by trains which is attributed to Network Rail under industry delay attribution rules.

Network Rail's plans to improve performance

4. We said in our February assessment of Network Rail's Strategic Business Plan proposals to improve performance that: '...overall we do not believe that the plans provide a clear, consistent and robust approach to delivering the targets.'
5. In its April update, Network Rail produced a comprehensive revision of this analysis. This was a significant improvement, based on further close working with train operators, which we very much welcome. In addition to the published plan, Network Rail provided us with supporting evidence.
6. As the April update supersedes the strategic business plan proposal the remainder of this chapter deals mainly with the April material.
7. Network Rail's performance improvement plans are based on:
 - establishing the likely levels of performance at the start of CP4;
 - assessing the performance benefits from its core initiatives e.g. its operations, maintenance and renewals expenditure and planned management initiatives;

- assessing the risks to performance improvements;
 - calculating possible contributions to improved performance from other enhancement expenditure;
 - considering train operators' contributions to enhanced performance;
 - comparing the forecast improvement from all these factors and identifying any shortfall to the HLOS targets; and
 - proposing further measures to close the gap.
8. Network Rail also considered whether the impact of the measures to reach the HLOS PPM targets will also deliver the significant lateness targets for England & Wales, and adjusted its proposed approach to ensure that both PPM and significant lateness targets were met.
9. The approach to improving performance and the impact on PPM is summarised in table D.1, and the impact on significant lateness is shown in table D.2.

Table D.1: Network Rail's plans to deliver PPM targets

| | England & Wales | England & Wales by sector | | | Scotland |
|--|-----------------|---------------------------|--------------|---------------|--------------|
| | | LSE | Regional | Long distance | |
| Performance at start of CP4 | 90.6% | 91.3% | 90.1% | 87.6% | 90.6% |
| Contributions from core initiatives | | | | | |
| Process improvements | 0.24% | 0.21% | 0.26% | 0.32% | 0.26% |
| Maintenance and renewals | 0.29% | 0.25% | 0.29% | 0.65% | 0.10% |
| Timetabling improvements | 0.59% | 0.51% | 0.61% | 1.08% | 0.24% |
| 'Stop it' initiatives | 0.13% | 0.14% | 0.08% | 0.19% | 0.30% |
| 'Control it' initiatives | 0.33% | 0.32% | 0.31% | 0.51% | 0.25% |
| Sub-total | 1.58% | 1.44% | 1.55% | 2.74% | 91.75 |
| Impact of risks | -0.86% | -1.08 | -0.52% | -0.57% | -0.20% |
| TOC contribution | 0.54% | 0.47% | 0.65% | 0.69% | 0.35% |
| Contributions from enhancements | 0.14% | 0.20% | 0.03% | 0.13% | 0.10% |
| Sub-total | -0.17% | -0.40% | 0.16% | 0.24% | 0.25% |

| | | | | | |
|---|----------------------|--------|--------|--------|------|
| End CP4 with no further measures (baseline) | 92.01% | 92.31% | 91.79% | 90.61% | 92% |
| HLOS target | 92.6% ¹⁸⁰ | 93.0% | 92% | 92% | 92% |
| Gap | | 0.69% | 0.21% | 1.39% | 0.0% |

Table D.2: Network Rail’s plans to deliver England & Wales significant lateness targets (% of trains significantly late)

| | LSE | Regional | Long distance |
|-------------|------|----------|---------------|
| 2006-07 | 2.62 | 3.07 | 5.99 |
| 2013-14 | 2.10 | 2.4 | 4.5 |
| HLOS target | 2.07 | 2.24 | 3.83 |
| ‘Gap’ | 0.03 | 0.16 | 0.74 |

10. We reviewed each stage of Network Rail’s approach, with assistance from Winder Phillips Associates¹⁸¹. We first consider the plans for England & Wales, followed by those for Scotland.

England & Wales – starting point

11. The starting point for CP4 is based on projections from the 2008/09 Joint Performance Improvement Plans (JPIPs) which forecast England & Wales PPM to be 90.6% with LSE at 91.3%, regional at 90.1% and long distance at 87.6%. The long distance forecast is furthest from the HLOS target, requiring a 4.4% improvement. The significant lateness target is measured against a 2006-07 base. Again, the long-distance sector is furthest from the target. Few consultees mentioned the CP4 starting point. Although the JPIP projection is regularly reviewed, we believe Network Rail’s analysis remains valid.

Core initiatives

12. Network Rail plans to improve performance during CP4 through a number of core ‘good business’ initiatives:
- process changes, for example joint ‘attention to detail’ initiatives with TOCs;
 - fewer asset failures as a result of maintenance and renewals expenditure;

¹⁸⁰ For illustration. The HLOS targets are sector based.

¹⁸¹ *Review of Network Rail’s performance improvement plans*, Winder Phillips Associates, May 2008. This can be accessed at www.rail-reg.gov.uk/upload/pdf/pr08-winphil-270508.pdf

- improvements in timetabling: using new computer systems to develop error free timetables and changes to poorly performing timetables;
 - 'stop it' initiatives to prevent the initial causes of delay. These include better targeted patrolling and fitting more remote condition monitoring equipment on the network; and
 - 'control it' initiatives to mitigate the impact of incidents, including better quality assistance to signallers and the use of GSM-R.
13. It is important that Network Rail maximises the benefit from these core initiatives to minimise the need for further expenditure on performance to meet the HLOS requirements. We believe that its analysis is generally sound, but Winder Phillips identified two areas (general infrastructure performance and the particular impact of signalling related incidents) where Network Rail's own analysis of performance benefits shows higher figures than it used in its overall final assessment. The difference was 0.12% in PPM.

Risks to improved performance

14. Network Rail considered risks to performance, but concluded that many of these can be fully mitigated. It has identified and quantified three risks that it believes will have a material impact that cannot be fully mitigated:
- passenger and freight growth – including the impact of running more and longer trains and increases in station dwell time;
 - the Thameslink project, including the risks created by infrastructure constraints during construction and increased service complexity; and
 - the generally high volume of engineering work – which will reduce network flexibility during the construction phase of projects.
15. We recognise that these areas of risk are genuine. Nonetheless, with further performance gains being hard won it is disappointing that, even after taking mitigation action, these factors are expected to reduce PPM by a total of 0.9% compared with its level at the end of CP3.
16. We built this adjustment into our draft determinations, but we stressed that Network Rail must continue to seek ways to reduce the impact of these factors.
17. Some consultees expressed concerns about the potential impacts on performance from enhancements engineering work, although no specific proposals were made to change the risk adjustment. We therefore accept Network Rail's numbers.

Performance gains from other enhancements

18. Network Rail is being funded for a substantial programme of enhancements. It is important that any performance benefits from these schemes are taken into account in the analysis.

19. Network Rail maintains that many projects will be performance neutral or that the benefits will be so close to the end of CP4 that they will not contribute materially to the final year PPM figure.
20. The projects shown in table D.3 were identified as having a PPM benefit.

Table D.3: Enhancement projects contributing to performance improvements

| Project | Impact on performance |
|---|--|
| Bletchley/Milton Keynes | Increased line speed, platforming at Milton Keynes |
| Reading | More through platforms |
| Gatwick Airport | Better layout reducing conflicts |
| Alexandra Palace | 3 rd track reducing conflicts |
| Hitchin | New flyover |
| York Holgate | 2 nd track on southern approach |
| Shaftholme | Humber freight traffic off ECML |
| Barry-Cardiff | Improved capacity |
| Kings Cross | Additional platforms |
| Platform lengthening, Increased power supplies | Mitigates some of risks from longer dwell times |

21. The SBP update showed a 0.14% PPM improvement from these schemes (an increase compared to the SBP). In the draft determinations, we considered whether other enhancement schemes should also produce a performance improvement, but concluded that Network Rail's list is reasonable and that the projected PPM impact is also reasonable.
22. In its response Network Rail said that our draft determinations had made amendments to 'a number of enhancement schemes that we had assumed would deliver performance benefits', for example Gatwick Airport and said 'the reduction in scope of these schemes removes up to 0.04% improvement in PPM from our plan'. We have reviewed the further information provided by Network Rail and agree that increased funding provision should be made for the scheme at Gatwick. We have also reviewed the information provided by Network Rail on the case for funding works at Nottingham to help deliver the required performance improvements, and again we have accepted the case.

Operator contributions to improved performance

23. Network Rail has assumed that TOC-on-self delays continue to fall through CP4. It projects a 10% reduction leading directly to a 0.35% improvement in national PPM and, through consequent reduction in TOC-on-TOC delays, to a further 0.14% improvement.

24. An additional 0.05% increase in national PPM is projected as a result of a 12.5% reduction in FOC-on-self delays.
25. Overall, reductions in operators' delays are expected to deliver a 0.54% improvement in PPM. Although these figures have not yet been fully underwritten by all operators, we believe that Network Rail's assumptions are reasonable. No major concerns were raised in consultation.

Calculating the gap

26. In the draft determinations, we added together all these impacts. There remained a gap to the HLOS figures for each sector in both PPM and significant lateness, as shown in table D.4.

Table D.4: Draft determinations analysis of gap between Network Rail baseline and HLOS PPM target

| | England & Wales | London and South East | Regional | Long distance |
|--------------------------|-----------------|-----------------------|----------|---------------|
| Network Rail view of gap | 0.59% | 0.69% | 0.21% | 1.39% |
| Our view of gap | 0.47% | 0.59% | 0.03% | 1.31% |

27. Winder Phillips noted some discrepancies between the detailed data Network Rail supplied on significant lateness and the SBP update tables. We used the detailed data in our analysis as this was the basis for Network Rail's value for money analysis. The detailed models showed a smaller gap, mainly affecting the long-distance sector.

Network Rail's proposals to close the gap

28. Network Rail proposed a number of measures to close the gaps, as shown in table D.5.

Table D.5: Possible measures to close the performance gaps

| Measure | Description |
|------------------------|--|
| Autumn Management | Improved methods of managing autumn/leaf-fall |
| Reduced bridge strikes | Bridge protection/warning systems at more locations |
| Security | Security teams at high risk sites to prevent vandalism/theft |
| MOMs | More Mobile Operations Managers at key locations to respond to incidents more quickly and reduce delay per |

| | |
|---------------------------|---|
| | incident |
| Hot Spares | Provision of standby train sets to mitigate delays at key locations |
| Track renewal | Accelerated track renewals to deliver improved performance |
| Fencing | Improved fencing at key sites to protect against vandalism |
| RCM Track Circuits/Points | The use of remote condition monitoring equipment on critical track circuits and points to prevent failures |
| Thunderbirds | Provision of additional emergency locos on key routes to quickly clear failed trains |
| NFRIP | Fitment of on train monitoring equipment as part of an overall programme of improving the reliability of TOC train fleets |
| UPS | Fitting uninterrupted power supplies |
| Level Crossings | Use of attendants to prevent road accidents at high risk sites |

29. It provided a value for money assessment of each proposal, in terms of performance benefit per pound spent. It had modelled this based on:
- type of delay;
 - proportion of incident sites where the scheme will be applied;
 - targeting (whether the scheme applies to the whole country or only certain routes and whether it is possible to focus on the worst sites);
 - how certain it is of the cause /effect; and
 - scheme costs.
30. It considered a number of possible ways of combining these measures into different baskets, producing a preferred basket as shown in table D.6. Network Rail stressed that the actual measures undertaken would be varied and refined over time in the light of experience and benefits generated.

Table D.6: Example of Network Rail’s proposed further measures to improve performance

| Initiative | Cost £m (2006-07 prices) |
|--------------------------|-----------------------------|
| Reducing bridge strikes | 4.4 |
| Improved fencing | 4.5 |
| ‘Hot spares’ | 6.0 |
| Better autumn management | 7.0 |

| | |
|--|--------------|
| More mobile operations managers | 60.0 |
| Fitting train condition monitoring equipment (NFRIP) | 106.2 |
| Remote condition monitoring of network | 11.2 |
| Security | 22.7 |
| Track | 28.2 |
| Total cost | 250.2 |

31. We assessed the scope of each initiative and its proposed cost. Winder Phillips noted that the plans were logical, but that some of the proposals, particularly those for NFRIP, are at a very early stage of development.
32. In our draft determinations we said our analysis of Network Rail's value for money model suggested that there is an alternative basket of measures costing around £200m which would deliver the same PPM benefits.
33. As we also believed that the gap between the baseline projection and the HLOS targets was less than that calculated by Network Rail, fewer measures would be required to reach the targets. Our calculations suggested a total cost of around £180m on a like for like basis.
34. We also noted that Network Rail did not allow for any efficiency savings in its calculations. Other than the NFRIP projects the measures are essentially maintenance and renewals and we believed we should allow for an efficiency factor as we have for other such activity. The NFRIP proposals themselves are at an early stage of development and should be capable of further refinement which would increase their 'efficiency' in the sense of the performance benefit per pound invested.
35. Overall we assumed that the scope for efficiencies is slightly lower than for basic maintenance and renewals, recognising that the work might not be exactly comparable. We therefore said in the draft determinations that the incremental funding for performance should be £160m.
36. We are therefore providing for £160m of incremental expenditure, of which £96m (60%) is assumed to be capital expenditure.
37. Network Rail's analysis also showed that PPM for two TOCs would still be below 90% at the end of the CP4 (National Express East Coast PPM is projected to reach 89.9% and First Great Western to reach 89.6%). Network Rail proposed two specific projects to meet the HLOS 'levelling up' requirement (see chapter 9):
 - further East Coast Main Line overhead line works (beyond those included in the core renewals proposal); and
 - doubling of the North Cotswolds line between Oxford and Worcester.
38. As described in chapter 9, we believe that both of these proposals should proceed primarily on the basis of their financial and economic business cases.

39. In its consultation response Network Rail contested the reduction in expenditure. It said that while it accepted that there was a mix of projects that could create a 'basket' costing £200m, this did not take sufficient account of risk. It said £250m represented the lowest value at which the mix of potential baskets provided sufficient confidence that it could deliver the performance metric.
40. We recognise that there is a risk associated with the baskets, but it is very unlikely that there are no offsetting opportunities as Network Rail has said that many of its proposals are at an early stage of development. We note the flexibility Network Rail will have to spend the funding provision as it sees fit. Network Rail has not provided any compelling new evidence to convince us of the need to change our funding provision for the performance fund.

Scotland

41. Network Rail followed the same analytical process when considering how to meet the 92% PPM HLOS target for ScotRail services.
42. The analysis is simpler for Scotland because:
 - there is only one operator to consider;
 - the target is for PPM only and does not include significant lateness; and
 - no gap was identified which required further funding.
43. Network Rail's proposals are reasonable and deliver the HLOS target. No major issues were raised by the consultation responses.

Further regulated outputs

44. In chapter 3 we explained the regulatory outputs we are setting for performance. In addition to the HLOS targets for 2013-14, we are setting trajectories for PPM and significant lateness, and separate Network Rail delay minute trajectories for passenger and freight services.
45. We reviewed the trajectories proposed by Network Rail. Our main aim is to ensure it is reasonable and consistent with other parts of the determination. We find that the proposed targets are reasonable. Further details are provided in the Winder Phillips report.
46. We note that Network Rail's consultation response pointed out that it had made a small mistake in the calculation of the trajectory for cancellations and significant lateness. The final tables for the targets are shown in chapter 4.

Annex E: Funding for enhancement schemes in CP4

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 being funded to meet a specification and has discretion over exactly which projects it commits to.
2. Although we have estimated the costs of delivering individual projects when determining how much revenue Network Rail needs in total, Network Rail is free to budget for individual schemes as it sees fit. The only exceptions are:
 - where government has made funding provision for a general area of spend without specifying the outputs (e.g. the strategic freight network in England & Wales or the small projects fund in Scotland). In these cases Network Rail will only be funded for spending up to the caps shown in table E1.
 - schemes subject to bespoke arrangements. The Thameslink project is covered by a protocol with a target price arrangement and the Airdrie-Bathgate project is subject to a fixed price agreement. The Scotland Tier 3 development fund is expenditure capped as shown.

Overview of schemes in England and Wales

3. The table shows six categories of schemes in England and Wales:
 - **HLOS baseline schemes:** Network Rail is funded to deliver the defined schemes.
 - **HLOS specified schemes and funds defined in the HLOS:** Network Rail is funded to deliver the defined schemes. The three funds required by the HLOS (NRDF, NSIP and SFN) are subject to expenditure caps.
 - **Schemes to deliver both the HLOS passenger kms specification and the London capacity specification on the East Coast route:** These deliver against requirements in tables A3 and A5 of the HLOS published in July 2007. Network Rail is being funded to deliver these defined schemes.
 - **Schemes required to deliver the HLOS capacity specifications for London and other urban areas:** These schemes, in conjunction with those covered above, deliver the requirements of tables A4 and A5 of the HLOS. We have determined the efficient level of funding Network Rail needs to deliver these specifications but Network Rail must finally decide which schemes are taken forward (provided it delivers the capacity specification) and must set out its decisions in its CP4 delivery plan.

- **HLOS Performance funding:** Network Rail is provided with this additional funding to deliver the PPM improvements and reductions in significant lateness required by the HLOS.
- **Other schemes:** schemes which are needed to give full effect to the HLOS in its statutory and regulatory context, and which meet the criteria set out in chapter 9 (for example, that projects are value for money). These include schemes, for example, which Network Rail had proposed for journey time improvements. Network Rail is being funded to deliver these defined schemes.

Overview of schemes in Scotland

4. This table has schemes in two categories:
- **HLOS:** Network Rail is funded for these schemes specified in the Scotland HLOS.
 - **Other schemes:** schemes which are needed to give full effect to the HLOS in its statutory and regulatory context, and which meet the criteria set out in chapter 9. Only one scheme is being funded in this category.

Table E.1: Funded enhancement schemes (£m 2006-07 prices)

| Route | Scheme name | Funding details |
|---|---|----------------------|
| England and Wales | | |
| HLOS baseline schemes | | |
| | Access for all | Capped at 220 |
| | King's Cross | |
| | West Coast: Stafford/ Colwich remodelling | |
| | West Coast: Bletchley/ Milton Keynes | |
| | West Coast power supply upgrade | |
| | Assessed total funding provision | 1093 |
| HLOS Specified schemes and funds | | |
| | Thameslink | Target price 2753 |
| | Intercity express programme | |
| | Network Rail discretionary fund | Capped at 234 |
| | National station improvement programme | Capped at 156 |
| | Strategic freight network | Capped at 208 |
| | Reading area redevelopment | |

| Route | Scheme name | Funding details |
|---|--|-----------------|
| | Birmingham New Street gateway project | |
| | Assessed total funding provision | 4187 |
| Schemes to deliver both the HLOS passenger kms specification and the London capacity specification on the East Coast route | | |
| 8 | Alexandra Palace to Finsbury Park 3 rd Up Line project | |
| 8 | Hitchin Grade separation | |
| 8 | East Coast main line level crossing closures | |
| 8 | York Holgate junction 4 th line | |
| 8 | Peterborough Station re-development and additional island platform | |
| 8 | Shaftholme Junction re-modelling | |
| 8 | Capacity relief (joint line via Spalding) | |
| 8 | Finsbury Park – Alexandra Palace down improvements | |
| | Assessed total funding provision | 509 |
| Schemes to deliver HLOS capacity specifications for London and other urban areas | | |
| | Route 1: Kent | |
| 1 | 12 car operations Sidcup and Bexleyheath routes | |
| 1 | Power supply enhancements | |
| 1 | 12-car operations: Dartford-Rochester including Gravesend | |
| 1 | 12-car operations: Greenwich and Woolwich routes | |
| 1 | 12-car operations: Hayes and Sevenoaks (stopping) services | |
| 1 | New Cross Enhancement to power supply | |
| 1 | 8-car operations: Victoria Eastern to Bellingham | |
| 1 | 8-car operations: Swanley-Ashford-Canterbury West-Ramsgate | |
| 1 | 12-car operations: Swanley-Rochester | |
| | Route 2: Brighton main line and Sussex | |
| 2 | Power supply enhancements | |
| 2 | Gatwick Airport remodelling and passenger capacity | |

| Route | Scheme name | Funding details |
|-------|---|-----------------|
| 2 | East Croydon passenger capacity scheme | |
| 2 | Suburban area 10-car operations to Victoria and London Bridge | |
| | Route 3: South West main line | |
| 3 | Power supply enhancements | |
| 3 | Waterloo International Terminal conversion | |
| 3 | Clapham Junction station capacity & platform lengthening | |
| 3 | 10 Car South West suburban railway | |
| 3 | Reading southern platforms | |
| | Route 5: West Anglia | |
| 5 | West Anglia outer services 12-car trains | |
| 5 | Power supply enhancements | |
| 5 | Seven Sisters small works | |
| | Route 6: North London line and Thameside | |
| 6 | Power supply enhancements | |
| 6 | Tilbury Loop platform extensions | |
| | Route 7: Great Eastern | |
| 7 | Power supply enhancements | |
| 7 | Chadwell Heath turnback | |
| | Route 8: East coast main line | |
| 8 | Platform lengthening (First Capital Connect services) | |
| 8 | Moorgate branch improvements | |
| | Route 10: North Trans-Pennine, North and West Yorkshire | |
| 10 | Capacity improvements (Leeds area) | |
| | Route 11: South Trans-Pennine, South Yorkshire and Lincolnshire | |
| 11 | South Yorkshire - platform lengthening | |
| 11 | Stabling for Northern (South Yorkshire) | |
| | Route 13: Great Western main line | |
| 13 | Maidenhead and Twyford (relief lines) | |
| | Route 16: Chilterns | |

| Route | Scheme name | Funding details |
|---|--|-----------------|
| 16 | Chiltern platform lengthening | |
| | Route 17: West Midlands | |
| 17 | Platform lengthening (West Midlands) | |
| | Route 19: Midland Main Line and East Midlands | |
| 19 | East Midlands platform extensions | |
| | Route 20: North West urban | |
| 20 | Capacity improvements (Manchester area) | |
| | Assessed total funding provision | 718 |
| HLOS performance funding | | |
| | Assessed total funding provision | 160 |
| Other schemes meeting our criteria | | |
| 6 | North London Line capacity enhancement | |
| 13 | Cardiff capacity (Barry - Cardiff Queen Street corridor) | |
| 17 | Redditch branch enhancement | |
| 17 | Extension of cross city services to Bromsgrove | |
| 8 | East Coast Mainline overhead line enhancement | |
| 13 | Cotswold Line re-doubling options | |
| 13 | Westerleigh - Barnt Green line speed upgrade | |
| 16 | Wrexham-London Marylebone journey time improvements | |
| 19 | Midland line St Pancras-Sheffield line speed improvements | |
| 19 | East Midlands resignalling - Nottingham Station Area | |
| | Trans Pennine Express line speed improvements | |
| | Projects to support move towards a seven day railway | |
| | Development fund for CP5 schemes | |
| | GSM-R freight only branches | |
| | Station security: prevention of vehicle incursions at stations | |
| | DC lines regenerative braking | |
| | Safety and environment plan carry over | Capped at 110 |
| | Assessed total funding provision | 681 |

| Route | Scheme name | Funding details |
|---|----------------------------|------------------------|
| Total England and Wales assessed funding provision | | 7348 |
| | | |
| | | |
| Scotland | | |
| Scotland HLOS projects | | |
| Scot | Airdrie - Bathgate | Fixed price 191 |
| Scot | Glasgow Airport rail link | |
| Scot | Borders railway | |
| Scot | Glasgow to Kilmarnock | |
| Scot | Tier 3 project development | Capped at 13 |
| Scot | Small projects fund | Capped at 20 |
| Other schemes | | |
| Scot | GSM-R | |
| Total Scotland assessed funding provision | | 390 |

Annex F: Network grant calculations

1. The level of grant is subject to two key tests:
 - **the investment test:** annual capital support (in the form of direct grants in this case) must not exceed the level of capital investment (defined as renewals and enhancement expenditure in this case); and
 - **the market body test:** annual income from sales (fixed and variable track access charges and other single till income) must cover at least 50% of production costs (operations and maintenance expenditure, plus depreciation as recorded in Network Rail's financial accounts).
2. The investment test must be met in England & Wales and Scotland individually, whilst the market body test must be met on a total Network level.
3. Given that the actual level of expenditure in CP4 is uncertain, we have increased the threshold for the market body test to 55% when calculating the maximum grant payments.
4. The data for renewals, enhancements, maintenance and opex are the values we have judged are necessary for Network Rail in CP4. Statutory depreciation is on the same basis as Network Rail calculates for its accounts.
5. The calculations for the investment test for England & Wales and Scotland and the market body test for the total network are set out in tables F.1 to F.3.
6. As discussed in chapter 28, Transport Scotland has requested to reprofile grant payments from the first two years in CP4 into the last 3 years in CP4. Actual grant payments in CP4 from Transport Scotland will therefore differ from our determination. Network Rail will receive capitalised financing costs from Transport Scotland associated with the deferral, which is included in the reprofiled amounts. The resulting grant payments for Scotland are shown in table F.4.

Table F.1: Calculation of network grants in England & Wales (investment test)

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|---------------------------------------|--------------|--------------|--------------|--------------|--------------|
| Investment test | | | | | |
| Network grant | 3,049 | 3,067 | 3,090 | 3,032 | 2,782 |
| Renewals | 2,383 | 2,060 | 1,812 | 1,651 | 1,567 |
| Enhancements | 1,370 | 1,857 | 1,399 | 1,381 | 1,215 |
| Renewals & enhancements | 3,754 | 3,917 | 3,210 | 3,032 | 2,782 |
| Investment test (maximum 100%) | 81% | 78% | 96% | 100% | 100% |

Table F.2: Calculation of network grants in Scotland (investment test)

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|--|------------|------------|-------------|-------------|-------------|
| Investment test | | | | | |
| Network grant (before reprofiling, see table F.4) | 355 | 359 | 351 | 236 | 198 |
| Renewals | 309 | 297 | 262 | 228 | 191 |
| Enhancements | 165 | 121 | 89 | 8 | 7 |
| Renewals & enhancements | 474 | 418 | 351 | 236 | 198 |
| Investment test (maximum 100%) | 75% | 86% | 100% | 100% | 100% |

Table F.3: Calculation of network grants for total network (market body test)

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|---|----------------|----------------|----------------|----------------|----------------|
| Fixed and variable track access charges | 1,351 | 1,375 | 1,367 | 1,485 | 1,744 |
| Other single till income | 545 | 547 | 574 | 603 | 616 |
| Annual income from sales | 1,896 | 1,923 | 1,940 | 2,089 | 2,360 |
| Opex and maintenance | 2,143 | 2,099 | 2,035 | 1,976 | 1,912 |
| Depreciation on a statutory accounts basis | 1,305 | 1,397 | 1,476 | 1,532 | 1,577 |
| Production costs | 3,448 | 3,496 | 3,511 | 3,508 | 3,489 |
| Market body test (minimum level 50%) plus headroom of 5% | 55% | 55% | 55% | 60% | 68% |

Table F.4: Our determination of network grant payments in CP4

| £m (2006-07 prices) | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | Total |
|--|----------------|----------------|----------------|----------------|----------------|---------------|
| England & Wales grant payments in CP4 | 3,049 | 3,067 | 3,090 | 3,032 | 2,782 | 15,020 |
| Scotland grant payments (without reprofiling) | 355 | 359 | 351 | 236 | 198 | 1,500 |
| Scotland reprofiling | (25) | (35) | 15 | 20 | 33 | 8 |
| Scotland grant payments in CP4 | 330 | 324 | 366 | 256 | 231 | 1,508 |