

**Periodic review 2008:**

**Draft determinations**

**June 2008**



OFFICE OF RAIL REGULATION



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# Foreword

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## 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.

But our evidence highlights that there remains significant room for further improvement. These improvements will need to be made 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. And this will need to be achieved alongside continued improvement in 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 they 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 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. We have undertaken detailed and thorough reviews and challenge of Network Rail's plans and carried out further extensive work ourselves to inform our determinations for the next five-year control period – 1 April 2009 to 31 March 2014.

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

Network Rail has committed 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 2009-14. However the evidence we have collected and the analysis we have undertaken in the periodic review has convinced us that, in order to become world-class, Network Rail must make bigger and faster improvements than it has proposed. Our draft determinations therefore both challenge and incentivise 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. 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 world-class company.

The key requirements of our draft determinations 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 a range of 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 above these levels.

## 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.

## Reduced levels of disruption to passengers and freight

Network Rail will be required to plan, manage and execute its large engineering programme to ensure

that the railway is open for as much of the time as possible and the level of disruption to passengers and freight is reduced. In our determinations we are providing funding for Network Rail to start to implement the 'seven-day railway' concept, which will deliver more radical improvements in network availability. New measures of network availability for passenger and freight services have been developed but we are yet to confirm the precise requirements.

## 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. However we do not consider it would be realistic to expect the company to achieve the full potential by 2014. In setting access charges, we have assumed that Network Rail will achieve two thirds of what we consider to be a reasonably cautious view of the current efficiency gap between it and other infrastructure managers. This equates to a 21% reduction in operating, maintenance and renewals expenditure in 2009-14. We consider that for a company aspiring to world-class status this is achievable. Network Rail had proposed 13% savings in its strategic business plan. We also expect the company to make significant increases in the efficiency with which it delivers its enhancement programme.

Our approach recognises that business transformation programmes take time, as well as providing Network Rail with stronger incentives to outperform our assumptions. Providing this strong incentive is in the best interests of customers and funders, who will benefit from outperformance from 2014 onwards.

To enhance the achievement of efficiency in 2009-14, we are introducing a mechanism whereby train operators will share a percentage of Network Rail's cost savings if it outperforms our determinations. 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 determinations we have assumed that Network Rail's expenditure over the control period on operating, maintaining, renewing and enhancing the railway network will be £27.8bn. This is £3.4bn (11%) less than the £31.1bn the company proposed.

The allowed rate of return on Network Rail's regulatory asset base (RAB) that we are setting for

2009-14 is 4.7%.<sup>1</sup> The allowed return 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 very 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 £10bn) which is not supported by the government guarantee. This will enhance the financial discipline on and within the company, as its financial and operational performance will come under much greater scrutiny from ratings agencies and actual and prospective lenders. The cost and availability of finance will be directly linked to the company's performance, thereby creating stronger incentives to operate efficiently. We are satisfied that the benefits of stronger corporate financial incentives 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 £26.5bn. This is £2.6bn (9%) less than the £29.1bn Network Rail asked for. This 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 30%, which will have the added advantage of improving their competitive position against other modes of transport.

Our reductions to Network Rail's proposals on its required income have enabled us to conclude that the high level outputs specified by the Secretary of State and Scottish Ministers can be afforded with the public funds that they are making available to support the mainline railways.

## 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 it faces mean that it needs to ensure that it has sufficient capability. We support Network Rail's intention to bring together its many detailed initiatives into an

overarching capability development programme with high level leadership.

We will monitor Network Rail's progress in delivering all of its work and the improvements required. If it is failing or appears likely to fail, we will not hesitate to take action to require the company to address its shortcomings. We are consulting on changes to the company's network licence to enhance and clarify its accountability to us.

Our draft determinations represent a positive outcome for passengers, freight customers and taxpayers. Network Rail, working with its industry partners, can and should deliver a better outcome at lower cost. If Network Rail and its partners meet the challenges we are setting down, the railway industry will be in a strong 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. Network Rail must grasp the opportunities it faces.

Your views on these draft determinations are important. We are consulting until 4 September 2008 and would like your views on our proposals before we confirm our final determinations, which we will publish on 30 October 2008.

**Bill Emery**  
chief executive

**5 June 2008**

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

# Summary

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## 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 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 pay to Network Rail in lieu of access charges.
3. In this document we set out our draft determinations for the outputs and access charges for consultation. We also explain the judgements we have made on Network Rail's costs and 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 they outperform our determinations.
4. Our determinations represent 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.
5. 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. In addition, further 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.
6. 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 not unduly difficult for the company to finance its activities.
7. Network Rail has committed 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.
8. We consider that the outputs can be delivered at significantly lower cost than Network Rail has projected and we have factored challenging, but achievable, assumptions for efficiency improvement into our calculations of access charges. 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.
9. The efficiency improvements we have factored into our calculations of access charges provide the opportunity for Network Rail, working with its industry partners, to outperform our assumptions. If they do they will benefit financially and reputationally. The lower levels of expenditure will translate into lower access charges in the following control period.
10. As part of PR08, we have strengthened the incentives acting on Network Rail and its partners, which should encourage them to strive to outperform our determinations. The most 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 debts). We support Network Rail's proposals to raise all new debt without the government guarantee. 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 strong investment grade credit rating if it is to raise the volume of debt required in CP4.



11. We consider that our draft determinations should allow our overarching objective for PR08 to be achieved in CP4, namely 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 then it should deliver 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.

## Background and approach

12. 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 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), which they submitted to us in July 2007.<sup>2</sup>
13. We have taken account of the HLOSs and SoFAs in making our determinations. 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.
14. Our determinations are the result of nearly three years work since we started PR08 in 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 a lot of 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 all the contributions made by stakeholders throughout PR08.
15. 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.

16. Our determination of the revenue that we consider Network Rail needs to run its business follows the standard 'building block' approach used by economic regulators, with 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.
17. 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 received 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 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.
18. Whilst we have made our determinations 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 may ultimately need to undertake to deliver the required outputs. 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

19. 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.
20. 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.

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

21. 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

22. 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 has produced the SBP in conjunction with its industry partners and it has 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 determinations.

## Outputs

23. A core part of PR08 has involved reviewing and improving the scope and definition of the outputs Network Rail needs to deliver. In CP4 we require an increased level of disaggregation of outputs across the network in order to strengthen Network Rail’s accountability to its customers.
24. 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.
25. 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	We expect Network Rail to deliver, by 2013-14, the improvements in the public performance measure (PPM) and the reductions in 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.
Station condition	The average condition of each category of station should at least be maintained (before taking into account improvements funded through the national stations improvement programme (NSIP)).
Network availability	We expect Network Rail to meet targets for limiting the disruption it causes to passenger and freight services as a result of engineering works, including specific improvements to reflect the benefits of full delivery of the seven-day railway concept on priority routes.
Customer satisfaction	Following the decision by Network Rail to include customer satisfaction in its management incentive plan, we will not set a regulated target in this area.

26. The required trajectories for train service performance are shown in tables 2 – 4. These all have the status of top-level regulated outputs. The CP4 targets required by the HLOSs are in shaded cells in **bold**.

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

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

**Table 3: Significant lateness and cancellations (England & Wales only)**

	% of services affected						Improvement from 2006-07 (%)
	2008-09	CP4					
		2009-10	2010-11	2011-12	2012-13	2013-14	
Long distance	5.3	4.9	4.5	4.2	4.0	3.8	<b>36.0</b>
London & South East	2.3	2.3	2.2	2.1	2.0	2.0	<b>21.0</b>
Regional	2.7	2.6	2.5	2.4	2.3	2.2	<b>27.0</b>

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

	2008-09	CP4				
		2009-10	2010-11	2011-12	2012-13	2013-14
<b>Passenger services (maximum delay minutes)</b>						
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
<b>Freight services (delay minutes per 100 train km)</b>						
Total	3.92	3.68	3.41	3.18	3.05	2.94

## Efficient expenditure

27. 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*

28. We have assessed Network Rail's projections for CP4 of £12.8bn for renewals and £4.9bn for

maintenance (before adjustment for efficiency improvement). 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 the activity levels and the 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 the 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 appear to be generating robust work plans that are clearly driven by the asset policies.
29. Our views on the robustness of the activity levels Network Rail proposed in its SBP fall into four broad categories:
- track, signalling, telecoms and plant & machinery renewals (representing in total 63% of total renewals expenditure): Network Rail's asset policies are clear and its modelling of CP4 renewals activities is relatively robust. The proposed activity levels are in line with the current level of activity. In some cases we have made relatively minor volume adjustments based upon evidence that there is a small degree of over-scoping of renewal plans;
  - electrification and operational property (together representing 18% of total renewals expenditure): The asset policies are also clear and we consider that the renewals volumes have been well modelled, but the proposed CP4 volumes are significantly higher than current activity 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 its updated following our questioning of the original figures;
  - civil engineering expenditure plans (representing 15% of total renewals expenditure): Network Rail has proposed significant increases in renewals 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;<sup>3</sup> and
  - maintenance activity levels: we consider that, for all asset categories, Network Rail's proposals are reasonable.
30. The result of our assessment is that we have reduced the provision for total CP4 renewals from £12.8bn (in the SBP update) to £11.9bn (7%) before the application of efficiency.

#### *Operating expenditure*

31. Network Rail has proposed controllable opex 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 area of our adjustment comes through our efficiency adjustments discussed further below. We also consider that expenditure on insurance can be lower than Network Rail has proposed.

#### *Operating, maintenance and renewals efficiency*

32. Across OM&R, Network Rail has proposed efficiency improvements in CP4 of 17.6% before adjustment for increase in the prices of its 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.
33. We have reviewed Network Rail's proposed efficiency initiatives for CP4 and we have undertaken a considerable amount of further work to assess the scope for efficiency improvement. We have considered very carefully the results from all the evidence available to us in order to inform our determinations.
34. 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.
35. 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' (LICB) 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 analysis has generated robust results that show, re-based to the end of CP3, Network Rail is around 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 a range of 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

<sup>3</sup> Control period 3 runs from 1 April 2004 to 31 March 2009.

- operating expenditure: Oxera has conducted a study for us on the scope for efficiency improvements in Network Rail's operating expenditure, by looking at efficiency performance in other regulated utilities. Considering the results of this work in the light of our own assessment of trends in rail operating expenditure and other detailed work on opex efficiency also shows a gap of around 35% at the end of CP3.

*The rate of improvement in OM&R efficiency in CP4*

- In making our judgements on efficiency we have considered the amount of improvement that Network Rail can make in CP4 and the speed at which it should be able to achieve this, as a core part of our overall package. We recognise the many and varied 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 making further cost savings. To this end, we have decided to profile further significant efficiency improvements over ten years. We recognise that many of the further cost savings that the company needs to make to address the full efficiency gap it faces may necessitate fundamental change to the way the company operates and implementation of new technologies and working methods. Given the circumstances Network Rail faces in CP4 it is right to give it sufficient time to achieve this.
- We have considered the profile of efficiency improvement over this time horizon. 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. Consequently, we consider that Network Rail should be able to catch-up two thirds of the efficiency gap during CP4 (23% 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).
- In order to determine the overall level of efficiency improvement in CP4 we have also taken into account the expected ongoing productivity improvements ('frontier-shift') that even the best performing companies would be expected to achieve, above that reflected in general inflation. Across OM&R we consider that this frontier-shift is 3% in CP4 as a whole.
- We have also made allowance for real increases in Network Rail's input prices above general inflation. We have done this through making direct adjustments to our efficiency assumptions based on the study Network Rail undertook. We carefully reviewed Network Rail's submission and although we have some specific concerns,

taken as a whole it is reasonable. We will reduce our 'gross' efficiency assumptions by 4% for maintenance and renewals, and 8% for controllable opex.

- Overall, taking into account catch-up of the efficiency gap, frontier-shift and input prices, we consider that Network Rail should be able to make efficiency improvements in CP4 of 5% per annum for maintenance and renewals, and 3.5% per annum for controllable opex. In cumulative terms, this gives overall efficiency improvements by the end of CP4 of 23% for maintenance and renewals, and 16% for controllable opex.

*Enhancement expenditure*

- 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 requirement 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: 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.
- We have undertaken a detailed review of Network Rail's enhancement proposals. In doing this we have examined both the scope of the projects Network Rail has proposed and the efficiency of the work.
- 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 were generally appropriate and reasonable they can be delivered at a lower cost. For the HLOS performance specification Network Rail made a case for additional funding to deliver the specification. We consider that the need was smaller than Network Rail has proposed. We have included a provision for capital expenditure of £160m for Network Rail to take forward implementation of the seven-day railway concept to provide for greater levels of network availability for passengers and freight.

44. On the DFT projects specified in the HLOS with capped funding for the major named schemes (Birmingham New Street, Reading, Thameslink) we have provided for the same funding as proposed in the HLOS which we found to be reasonable given the scope of the work.
45. 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.
46. Network Rail has set out initial proposals for development of the strategic freight network (SFN). We have reviewed the company's proposals and we require it to develop more detailed plans with the industry, up to a maximum of £208m in CP4.
47. 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 proposed by Network Rail.
48. Overall we consider that the enhancement programme funded through PR08 can be delivered for £7.5bn, 17% less than Network Rail has proposed.
49. 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**

50. In CP4, Network Rail faces a major challenge to deliver the enhancement programme, which is three times as large as in CP3, as well as carrying out its core asset renewals work. The company considers it can deliver its work programme.
51. 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 to underpin delivery its CP4 programme. We support Network Rail's intention to bring together its many detailed initiatives into an overarching capability development programme with high-level leadership and resourcing.
52. We will be monitoring closely the progress of its enhancement projects through the stages of scheme development, because slow project development risks delaying the programme.

## **Safety management**

53. 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.
54. 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.
55. 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 determinations 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.
56. 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.

## **Efficient expenditure in CP4**

57. 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 5 summarises our assumptions on the level of expenditure that we consider Network Rail needs to undertake in CP4 in order to deliver its required outputs. Overall we consider that Network Rail overstated its requirements in its plans, and can achieve its outputs through expenditure of £27.8bn, around £3.4bn (or 11%) less than it proposed in its plan.

**Table 5: Summary of our CP4 efficient expenditure assumptions**

£m (2006-07 prices)	Network Rail's SBP/SBP update	Our determination	Difference
Controllable opex	3,776	3,392	(10%)
Non-controllable opex	1,796	1,776	(1%)
Maintenance	4,889	4,584	(6%)
Renewals	11,658	10,504	(10%)
Enhancements	9,029	7,507	(17%)
<b>Total</b>	<b>31,148</b>	<b>27,763</b>	<b>(11%)</b>

## Financial and risk framework

58. We are making a number of improvements 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 determinations; and
  - provide protections to the company to deal with risk and uncertainty.

### Unsupported debt

59. We support Network Rail's intention that the use of the financial indemnity (guarantee) the government provides to Network Rail of all its debt will be restricted from the start of CP4 so that it can only be used to refinance existing debt. This means that Network Rail will need to raise debt on an unsupported basis for the first time from early in CP4. 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 strong investment grade credit rating in order to raise about £10bn of new debt in CP4.
60. 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.
61. 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 £880m (in nominal terms) over CP4.

### Allowed return

62. We will provide Network Rail with an allowed return that reflects its risk adjusted cost of capital. Based on a recent study conducted for us by CEPA, which takes 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 4.7%.<sup>4</sup>
63. 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

64. 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 determinations.
65. 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 £1.3bn 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 £1.3bn (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 determinations that this expenditure would be logged-up and added to the RAB at the

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

start of CP5 if the additional expenditure is justified and incurred efficiently;

- 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 £2.7bn 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.
66. Ultimately if the various protection measures are exhausted and the company breaches a key financial trigger (a value of 1.35x on average over a three year 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

67. 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 £7.2bn, £1.5bn less than that which Network Rail assumed in its SBP update, where Network Rail just adopted the upper bound of the possible range for amortisation that we previously published.

## Revenue requirement

68. Based on our assessment of efficient expenditure, and the parameters we have established for the financial framework, table 6 shows our determination of the revenue requirement that Network Rail needs in CP4. We consider that Network Rail has overstated its revenue requirement for CP4 and that the company requires £2.7bn (9%) less than the £29.1bn that it set out in its SBP update.

**Table 6: 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	1,020	961	910	868	825	4,584	4,989
Controllable opex	728	702	678	654	631	3,392	3,777
Non-controllable opex	328	349	360	367	372	1,776	1,796
Schedule 4 and 8	212	196	192	164	159	924	927
Allowed return	1,532	1,650	1,748	1,821	1,881	8,633	8,856
Amortisation	1,446	1,446	1,446	1,446	1,446	7,230	8,690
Tax	-	-	-	-	-	-	85
<b>Gross revenue requirement</b>	<b>5,267</b>	<b>5,304</b>	<b>5,334</b>	<b>5,320</b>	<b>5,314</b>	<b>26,539</b>	<b>29,119</b>

## Contractual and financial incentives

69. 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.
70. We are implementing an efficiency benefit-sharing mechanism between Network Rail and train operators, on the basis of the proposals

made by the industry to us. If Network Rail can deliver all of its outputs and obligations for less than we have determined then it will share 25% of this 'outperformance' with 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.



71. We are retaining a volume incentive in CP4, to incentivise Network Rail to respond to demand levels greater than those assumed in the SBP (based on the HLOSs).
72. 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.
73. 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.
75. Tables 7 and 8 summarise our assessment of the affordability calculations.
76. Both HLOSs are affordable (i.e. the SoFAs are adequate). The England & Wales HLOS shows surpluses in each year, with £1.3bn surplus over CP4 as a whole.
77. The Scottish HLOS is affordable over CP4 as a whole (with £80m surplus) but there are deficits in the final three years of CP4, though this does not alter our decision that the Scottish HLOS is affordable. We will discuss with Transport Scotland and Network Rail the possible profiling of Network Rail's revenue requirement for Scotland and/or other calls on the SoFA.

## HLOS affordability

74. We have examined the whole industry costs to the two governments of delivering the HLOSs, which includes 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.
78. The England & Wales SoFA was defined in nominal terms based on an inflation (RPI) forecast of 2.75% per annum. We have converted the SoFA into 2006-07 prices using this forecast. We have developed our own RPI forecast which is higher, based on more up-to-date economic forecasts. We have also tested the affordability of this HLOS against our RPI forecast and it remains affordable though the surplus reduces to £0.8bn over CP4. The Scottish SoFA was stated in real terms.

**Table 7: 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	13,302
Less franchise support payments*	(1,496)	(1,259)	(988)	(755)	(473)	(4,971)
Add back franchise payments to Network Rail (as assumed in the SoFA)	2,863	2,879	2,887	2,890	2,895	14,414
<b>Funds available for Network Rail</b>	<b>4,256</b>	<b>4,320</b>	<b>4,605</b>	<b>4,703</b>	<b>4,866</b>	<b>22,749</b>
Less Network Rail revenue requirement (net income from sources other than franchised train operator access charges or network grant)	4,248	4,296	4,318	4,318	4,312	21,492
<b>Surplus/(deficit)</b>	<b>8</b>	<b>24</b>	<b>286</b>	<b>385</b>	<b>554</b>	<b>1,257</b>

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

**Table 8: 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 payments	(321)	(331)	(359)	(360)	(367)	(1,738)
Add back franchise payments to Network Rail (as assumed in the SoFA)	150	150	150	150	150	750
<b>Funds available for Network Rail</b>	<b>588</b>	<b>645</b>	<b>467</b>	<b>458</b>	<b>456</b>	<b>2,612</b>
Less Network Rail revenue requirement (net income from sources other than franchised train operator access charges or network grant)	500	508	511	510	505	2,534
<b>Surplus/(deficit)</b>	<b>87</b>	<b>137</b>	<b>(44)</b>	<b>(52)</b>	<b>(49)</b>	<b>78</b>

## Access charges and network grant

79. 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.
80. 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.
81. 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.
82. 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.
83. Table 9 shows the sources of income in CP4 (at Great Britain level) to recover the gross revenue requirement.

## Monitoring and enforcement

84. 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.
85. Our monitoring will focus primarily on the following issues:
- whether the industry is on course to deliver the HLOS safety requirement;
  - whether the top level regulated outputs are being delivered;
  - whether the programme of works to deliver the capacity specifications of the two HLOSs is on course to deliver the required outputs;
  - 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 9: 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	405	410	420	427	432	2,095
Franchised passenger train operators – fixed charges	643	681	677	941	1,146	4,088
Income from freight operators	66	69	70	72	74	350
Income from open access operators	19	19	19	19	19	94
Station long term charge income	134	129	125	121	119	629
Schedule 4 and 8 income	212	196	192	164	159	924
Other income (inc property rental, property sales and depots income)	391	386	393	412	416	1,999
Network grant	3,396	3,414	3,437	3,164	2,949	16,360
<b>Total income</b>	<b>5,267</b>	<b>5,304</b>	<b>5,334</b>	<b>5,320</b>	<b>5,314</b>	<b>26,539</b>

Rounded to the nearest million.

86. 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.
87. 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.
88. We will continue to publish full assessments of Network Rail's performance annually, and shorter focussed assessments in the Network Rail Monitor. We will review the form and content of both publications from time to time to ensure that they are achieving our objective of communicating these matters effectively.

## **Early start**

89. The early start programme provides early decisions, ahead of our final determinations, on funding for schemes that Network Rail would like to progress in the first year of CP4, to ensure that there is no hiatus in developing the scheme.
90. We are confirming approval of further schemes for the early start programme, following our approval of certain schemes in February 2008. We confirm the Reading, Birmingham New Street, Kings Cross, Bletchley to Milton Keynes and the North London Line can proceed under the early start programme. We are not accepting the South-West mainline 10-car or the Network Rail Discretionary Fund schemes for early start.

## **Consultation**

91. Following consideration of responses to our proposals in this document we will publish our final determinations on outputs and the overall level of access charges on 30 October 2008. The final audited levels of the detailed individual access charges and associated price lists on 18 December 2008.

# Acronyms and abbreviations

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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
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
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
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
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
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

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## 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 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 pay to Network Rail in lieu of access charges.
- 1.3 Our determinations represent 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 against risks and uncertainties, the contractual and financial incentives, the structure of charges, and the monitoring and enforcement framework.
- 1.4 In this document we set out our draft determinations of the access charges and outputs. 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 determinations.
- 1.5 In addition to these issues, the document also sets out the remaining principles on the framework for setting outputs and access charges and includes our outstanding decisions on the 'early start' programme for Network Rail. 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.
- 1.6 Following consideration of responses to our draft determinations we will publish our final determinations on the overall level of access charges on 30 October 2008, with final levels of individual access charges and associated price lists on 18 December 2008. It is this document that will set out our conclusions and the relevant aspects of these conclusions will be incorporated into the review notice(s) which will be published subsequently.

## Structure of this document

1.7 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 determinations 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 determinations for the financial framework and Network Rail's overall revenue requirement.
- Part D sets out our determinations 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 determinations 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, summarises our proposed approach to monitoring and enforcement in CP4 and sets out the outstanding decisions for the early start programme.

## Price base

1.8 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).

## Responses to this document

1.9 Please can you send your responses in electronic format (or if not possible, in hard-copy format) by **Thursday 4 September 2008** to:

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- 1.10 If you send a written response, you should indicate clearly if you wish all or part of your response to remain confidential to ORR. Otherwise we would expect to make it available in our library and on our website and potentially to quote from it. Where your response is made in confidence please can you provide a statement summarising it, excluding the confidential information, that can be treated as a non-confidential response. We may also publish the names of respondents in future documents or on our website, unless you indicate that you wish your name to be withheld.
- 1.11 Copies of this document can be found in the ORR library and on the ORR website ([www.rail-reg.gov.uk](http://www.rail-reg.gov.uk)).

## PR08 timetable

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

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

Date	Milestone
9 July 2008	Industry seminar on the draft determinations
17 July 2008	We publish draft content of the review notice
4 September 2008	Closing date for consultation responses to the draft determinations
30 October 2008	We publish our final determinations for CP4
18 December 2008	Final access charges (price lists/charge schedules) are audited and approved by us. Review notice(s) are served starting the formal implementation of PR08
5 February 2009	Final point at which objections could be made to our review notice(s)
By 27 February 2009	Network Rail publishes its CP4 delivery plan

## Our process to complete our final determinations

- 1.13 We have set out a number of specific areas in these draft determinations where we will need to do further work between now and publication of our final determinations. This work includes determining suitable trajectories for the passenger and freight network availability measures, publishing a full procedural document that sets out how the re-opener provisions could be triggered, publishing the draft content of our review notice and further analysis on a number of specific access charging issues. We will also take account of Network Rail's actual 2007-08 audited regulatory accounts and a more accurate forecast of its 2008-09 financial performance, in particular to refine

the opening RAB and debt values we use in our calculations of the revenue requirement.

- 1.14 We are hosting an industry seminar in July. We will carefully review all consultation responses we receive. All this remaining work and responses from stakeholders will then be brought together for our final determinations.

### **Corporate strategy**

- 1.15 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 and plan to consult on it in July 2008. The strategy 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.

# **PART A: BACKGROUND AND APPROACH**



## 2. Background and approach

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### 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 A contains further specific objectives for PR08. In terms of outcomes from the railway in CP4, if these objectives is 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 determinations 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 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).<sup>5</sup>
- 2.5 We have taken account of the HLOSs and SOFAs in making our determinations. 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 close to 90% on a moving annual average basis and is forecast to be above 90% by the end of the control period.

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<sup>5</sup> The HLOS published by the DfT may be accessed at <http://www.dft.gov.uk/about/strategy/whitepapers/whitepapercm7176/> and the HLOS published by Transport Scotland may be accessed at <http://www.transportscotland.gov.uk/files/documents/rail/HLOS-July-2007.pdf>.

*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 2003-04. Network Rail forecast 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.<sup>6</sup> 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.<sup>7</sup> 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 2007.<sup>8</sup>

### *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.

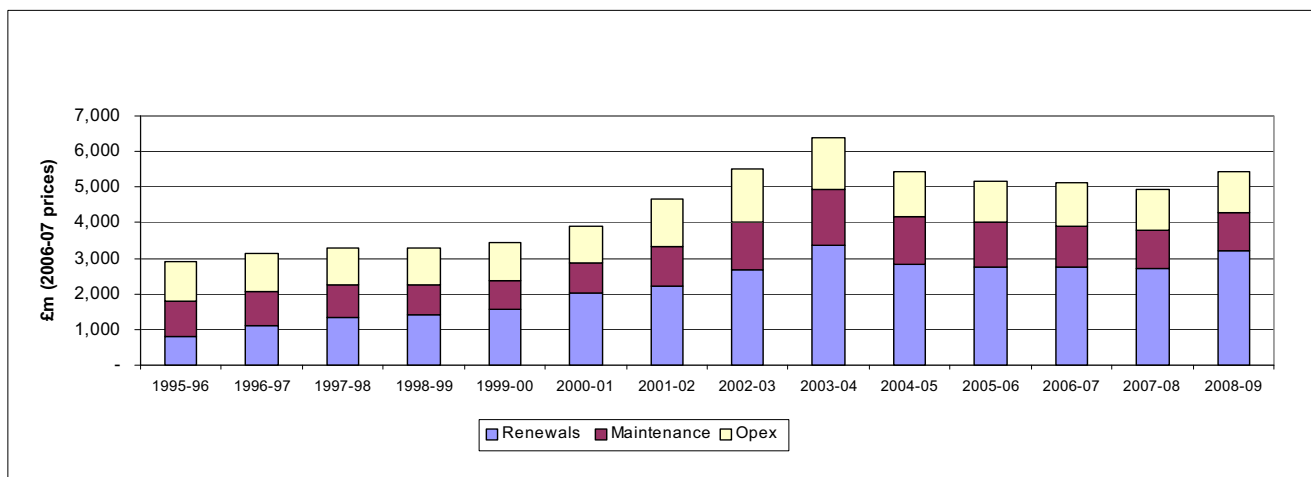
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<sup>6</sup> The Railway Strategic Safety Plan 2007 – 2009 may be accessed at [http://www.rssb.co.uk/pdf/reports/strategic\\_safety\\_plan\\_07-09.pdf](http://www.rssb.co.uk/pdf/reports/strategic_safety_plan_07-09.pdf).

<sup>7</sup> The Railway Strategic Safety Plan 2008 – 2010 may be accessed at [http://www.rssb.co.uk/pdf/reports/strategic\\_safety\\_plan.pdf](http://www.rssb.co.uk/pdf/reports/strategic_safety_plan.pdf).

<sup>8</sup> The Annual Safety Performance Report 2007 may be accessed at [http://www.rssb.co.uk/pdf/reports/ASPR\\_2007.pdf](http://www.rssb.co.uk/pdf/reports/ASPR_2007.pdf).





**Figure 2.2: Operating, maintenance and renewals expenditure since privatisation**

## 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 determinations 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 determinations. We expect the package to be considered and judged as a whole. The components of the package comprise:

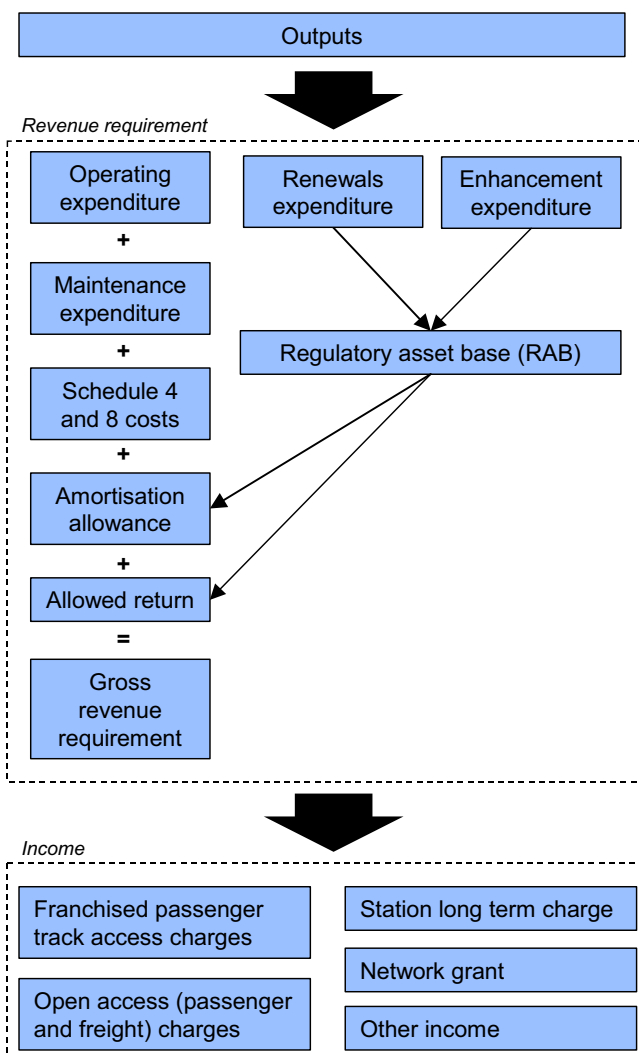
- the outputs that Network Rail needs to deliver (including the related change mechanism);
- the level of efficient expenditure we consider Network Rail should incur in achieving the outputs;
- the assumptions on the income Network Rail will earn as part of the single till calculations;
- the financial 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' 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.<sup>9</sup> 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, respectively, the amortisation allowance and the allowed return on the RAB;



**Figure 2.3: Building block approach**

- the return on the RAB covers the interest payments that the company needs to make to its creditors, the FIM fee payment to government, 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);

<sup>9</sup> 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.

- 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.

## 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. All our documentation relating to PR08 is available on our PR08 webpage.<sup>10</sup>
- 2.21 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.<sup>11</sup>

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<sup>10</sup> Our PR08 webpage may be accessed at <http://www.rail-reg.gov.uk/server/show/category.180>.

<sup>11</sup> *Strategic Business Plan: Control Period 4*, Network Rail, October 2007. This may be accessed at <http://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/4357.aspx>.

## Form of the price control

2.22 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 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

2.23 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

2.24 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.

2.25 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

- 2.26 We are continuing to protect Network Rail from general inflation risk, by establishing the determinations in real terms and indexing the access charges each year based on the November value of the all items retail price index (RPI).
- 2.27 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

- 2.28 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:
- separate determinations 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.
- 2.29 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.

# **PART B: OUTPUTS AND EXPENDITURE**





## **3. Overview of our outputs and efficient expenditure assessment**

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### **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 compliance with 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 infrastructure 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 effective 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 and cost estimates significantly in a range of 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 requirements and our assessment of Network Rail's efficient expenditure for CP4:
- chapter 4 summarises the work we are doing to review Network Rail's accountability through its network licence and sets out in full the 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 which is a key input to the calculation of the amortisation allowance (discussed further in chapter 13);
  - 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 determinations on the improvements in OM&R efficiency that we consider is achievable by Network Rail in CP4;
  - chapter 9 contains our assessment of Network Rail's proposals on enhancement expenditure, which includes specific work on the efficiencies for enhancements;
  - 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

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### 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 determinations 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 developing needs of its customers and funders. The essential features of the manner in which it does this, and the delivery of the outputs for which we are setting formal requirements, 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 Network Rail's obligations clearer and more purposive. 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 We have held discussions with Network Rail and key stakeholders and today we are publishing, alongside this document, our policy consultation on a suite of changes to the network licence.<sup>12</sup> The statutory consultation needed before changes are made will start after our final determinations for PR08 have been published.

#### *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, 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

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<sup>12</sup> *Review of the Network Rail licence: consultation*, Office of Rail Regulation, June 2008.

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. 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.<sup>13</sup>
- 4.7 We see the MIP 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.
- 4.8 We have asked Network Rail to ensure that its MIP for CP4 reflects our determinations, including the new financial framework. We propose in future to require Network Rail's remuneration committee to make its decision making process on management bonuses transparent. 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 out<sup>14</sup> 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 2009 business plan. 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.
- 4.10 Network Rail's 2009 business plan will therefore be an essential document, acting as the delivery plan for CP4 subject to a regulated change control mechanism. Network Rail will need to satisfy us that the plan is consistent with the final determinations of PR08. It will then become 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

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<sup>13</sup> Details of Network Rail's MIP can be found on its website at <http://www.networkrail.co.uk/browseDirectory.aspx?dir=\Regulatory%20Documents\Regulatory%20Compliance%20and%20Reporting\Management%20Incentive%20Plan%20Statement&pageid=2893&root=>

<sup>14</sup> *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](http://www.rail-reg.gov.uk/upload/pdf/351.pdf).

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 Under Network Rail's network licence we must issue the notice setting the level of detail required in the 2009 business plan by 31 October 2008. We are taking this opportunity to consult on a draft notice for Network Rail's 2009 business plan. The draft notice can be found at annex B and we invite your comments by 4 September.

## Safety

- 4.12 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.<sup>15</sup> The measurement of this risk will be by reference to the industry's Rail Safety and Standards Board'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.
- 4.13 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).
- 4.14 Safety issues are discussed further in chapter 11.

## Train service performance

- 4.15 Network Rail is required to deliver, by 2013-14, the improvements in the public performance measure (PPM) and the reductions in 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 year. These requirements apply to franchised and open access operators when taken together, and to franchised operators considered alone.
- 4.16 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.
- 4.17 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

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<sup>15</sup> Measured in fatalities and weighted injuries per million passenger kilometres (for passengers) and per million hours worked (for rail industry employees).

maxima are normalised for the volume of freight traffic, which tends to fluctuate more than the volume of passenger traffic.

- 4.18 The required trajectories are shown in tables 4.1 to 4.3. These all have the status of top-level regulated outputs. The CP4 targets required by the HLOSs are in shaded cells in **bold**.

**Table 4.1: PPM moving annual average<sup>16</sup> for passenger operators**

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

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

**Table 4.2: Significant lateness and cancellations (England & Wales only)**

	% of services affected						Improvement from 2006-07 (%)
	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	
Long distance	5.3	4.9	4.5	4.2	4.0	3.8	<b>36.0</b>
London & South East	2.3	2.3	2.2	2.1	2.0	2.0	<b>21.0</b>
Regional	2.7	2.6	2.5	2.4	2.3	2.2	<b>27.0</b>

Notes: 200-09 figures are forecasts. HLOS targets in **bold** in shaded cells.

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'.

<sup>16</sup> The moving annual average is the total for previous 13 four weekly periods divided by 13.



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

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
<b>Passenger services (maximum delay minutes)</b>						
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
<b>Freight services (delay minutes per 100 train km)</b>						
Total	3.92	3.68	3.41	3.18	3.05	2.94

Note: 2008-09 figures are forecasts

- 4.19 Network Rail has proposed PPM improvement trajectories and trajectories for Network Rail 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 operators.
- 4.20 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 will need to 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.
- 4.21 Annex C provides detail of our assessment of the measures necessary to achieve these improvements in train performance.

## Network capacity

- 4.22 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.
- 4.23 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.
- 4.24 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.

- 4.25 This review 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 to find ways of delivering the specification more economically and we have taken this into account in reaching our determination.
- 4.26 The review also provides funding to implement the strategic freight network (SFN) 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.
- 4.27 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', and subject to the proposed change procedure, 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.
- 4.28 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**

- 4.29 Baseline network capability requirements will be as described in the relevant documents at 1 April 2009. These must describe the capability of the network in terms of:
- track mileage and layout;
  - line speed;
  - gauge;
  - route availability; and
  - electrification type/miles.
- 4.30 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 required to restore routes to published capability

following a short-term network change must also be carried out without further funding.

- 4.31 Network capability must then be maintained at this level, unless changed by agreement through the industry network change procedure.

### **Network availability and the “seven day railway”**

- 4.32 The railway network needs to be maintained, renewed and enhanced, and this requires engineering possessions to allow work to be undertaken safely and efficiently.

- 4.33 In the past the emphasis has been on ensuring that operators are compensated for the effect of closures on their income. But we are seeing changes both in the extent of possessions and the impact that these have on users of the railway, for reasons including:

- greater volumes of work to sustain a more heavily used network;
- a growing number of enhancement projects;
- new high-output engineering plant requiring different types of possessions;
- revised safety arrangements for on-track staff and passing trains; and
- growing demand for travel at weekends (e.g. Sunday shopping and entertainment) and overnight (e.g. to airports).

- 4.34 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.

- 4.35 The SBP update contains, within the core maintenance and renewal plans, the first steps in this direction. Key initiatives include more efficient ways of starting and ending possessions and radical new engineering techniques such as use of modular switch and crossing units to reduce replacement times to a fraction of current levels.

- 4.36 The SBP also proposes additional expenditure to reduce disruption further, although this would increase Network Rail’s own costs. Details of our assessment and determination in respect of this proposal are set out in chapter 9.

- 4.37 To maintain a clear focus on this issue and to ensure that the benefits for which Network Rail is funded in PR08 are demonstrably delivered we are now

introducing specific measures of the disruption to passenger and freight traffic caused by possessions, and we will set targets for improvement in these.

- 4.38 Although the effects of individual closures have been recorded in internal industry publications, this data has never been brought together or published in aggregate form. It has been necessary to develop entirely new measures and to make projections of changes in them during CP4.
- 4.39 With Network Rail we co-funded a project to develop the new measures, working closely with others in the industry. Our consultants, Steer Davies Gleave (SDG), reviewed a wide range of possible measures. Their report is available on our website.
- 4.40 It became apparent that separate measures for passenger and freight traffic would provide a clearer indication of the effects of disruption. For passenger traffic our chosen measure is based on the existing Schedule 4 Compensation System (S4CS) without application of discount factors for early notification.
- 4.41 We concluded that use of a similar approach for freight was impractical because of the high level of customer-driven timetable changes. Instead the network was divided according to the amount of freight traffic passing over each section and these sections then weighted in importance to reflect the level of freight revenue affected.
- 4.42 Because these new metrics have been developed very recently we are still completing our work to determine suitable trajectories for them in CP4. We will consult separately on these later in the month before incorporating them in our final determination.

## Stations

- 4.43 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 assets<sup>17</sup>. In 2007 Network Rail completed surveying the condition of around 90% of its stations. Results showing the average condition of stations in each station category will be published in Network Rail's annual return in July 2008.
- 4.44 Under this determination Network Rail is funded as a minimum to maintain average condition scores within each station category A to F<sup>18</sup>, both in England & Wales and in Scotland. Minimum levels of average condition for each station category, based on the annual return information, will be published in our final determinations in October 2008.
- 4.45 This obligation applies before taking into account improvements which are to be funded under the England & Wales national stations improvement

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<sup>17</sup> This measure does not take into account the type of facilities at stations, for which a separate index is used.

<sup>18</sup> The categories reflect the different sizes and passenger throughputs of stations.

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

- 4.46 We explained in February<sup>19</sup> that we have 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 to demonstrate that its plans are consistent with maintaining these depots on a sustainable long-term basis.
- 4.47 Network Rail has 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.
- 4.48 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

- 4.49 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 (among other things) the satisfaction of passenger and freight train operators.
- 4.50 We believe that this is the most appropriate way for customer satisfaction to be taken into account, and we therefore do not propose to set any regulatory output requirements in this area.

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<sup>19</sup> The document *Update on the framework for setting outputs and access charges and strategic business plan assessment* is available at [www.rail-reg.gov.uk/upload/pdf/351.pdf](http://www.rail-reg.gov.uk/upload/pdf/351.pdf).

## Asset serviceability and sustainability

- 4.51 We explained in February 2008 that we do not believe it necessary to set top-level regulated output requirements for asset management or condition (the exception being station condition) but that we will monitor against a dashboard of indicators including targets that Network Rail will include in its CP4 delivery plan. During the course of CP4 if Network Rail departs materially from the trajectories in the delivery plan we will call on it to demonstrate clearly how it is nonetheless complying with its asset management licence obligations.
- 4.52 The dashboard of indicators that we intend to use is extensive. Much of its detail varies little from our monitoring regime in the current control period because it is important to have continuity in the time series of the measures we use. It is also important that we have a clear baseline for the start of CP4, which means that indicators must be well understood and consistently measured.
- 4.53 We confirm that we will not be using Network Rail's asset stewardship index (ASI) as a means of monitoring overall network condition. We note that 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 4.4 and include:
- track geometry;
  - rail management;
  - reliability of signalling and electrification equipment;
  - structures condition;
  - maintenance depot condition; and
  - condition and/or age profile of traction power distribution equipment and signalling installations.
- 4.54 Network Rail has provided trajectories for each of these proposed indicators as part of its SBP. We consider that these are reasonable and we will assess Network Rail's stewardship of its infrastructure by monitoring achievement of these targets through the course of CP4.
- 4.55 We will also use a number of second-tier measures for further diagnosis of Network Rail's stewardship. These are shown in table 4.5.
- 4.56 As outlined in chapter 31, we will keep under review the progress Network Rail makes in delivering the expected activity volumes in CP4. This provides an important leading indicator of future network serviceability.

**Table 4.4: Principal asset condition monitoring measures**

	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 inspection (number)	New measure	1,131	1,085	1,053	1,032	1,011
TSRs imposed (severity index)	M4	106	104	101	99	97
Station stewardship measure - station categories A-F	Modified M17	to be 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	M11,M12	71	67	64	61	58
Signalling failures	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

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 bands.

**Table 4.5: Second-tier asset condition monitoring measures**

	Measure	2009-10	2010-11	2011-12	2012-13	2013-14
Existing infrastructure delay measures (no. incidents and delay caused)						
Rail breaks (per 100km by route type)	M1 modified					
Rail defects discrete (per 100km) by route type (immediate and intervention level)	M2 modified					
Rail defects contiguous locations by route type	M2 modified					
Track geometry standard deviations by route type	M3 modified					
Immediate action geometry faults by route type	M5 modified					
TSRs due to track faults by route type	M4 modified					
ESRs due to track faults by route type	M4 modified					
Delivery of whole life cost track maintenance activities, e.g. repadding, rail grinding, rail lubrication, track drainage etc	-					
Track renewal quality	-					
Structures Condition Marking Index (to be developed for all structure types as well as bridges)	M8 et al					
No. of TSRs applied to structures in poor condition	M4					
No. of earthworks failures	M6					
Drainage (measures to be developed)						
Signal asset condition						
Asset volume renewal measures including but not limited to M20-M29	M20-M29					
Capability measures, including but not limited to C1-C4	C1-C4					
Possessions indicators						

Individual targets to be set by Network Rail

Note: Many of the above will either use or require development from existing asset reporting measures.



## CP4 delivery plan: change process

- 4.57 We explained in February 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.
- 4.58 We confirm that the change process will cover:
- **capacity:** any proposed changes from the deliverables or milestones as described in Network Rail's published CP4 delivery plan should be notified to us for approval. We will check that changes are consistent with the relevant HLOS and will consult interested parties before approving the change. Where there are bespoke arrangements in place (e.g. the Thameslink project), the change process in those arrangements will apply, but we will investigate complaints and monitor overall delivery;
  - **performance:** where changes to performance plans and trajectories have been agreed with operators through the joint performance improvement plan (JPIP) process; and
  - **other disaggregated output commitments:** where Network Rail wishes to make changes to any other disaggregated commitments in the CP4 delivery plan that form reasonable requirements for its customers or funders, it should notify us and indicate where it has agreement from the relevant party(s). We will investigate any complaints about proposed changes from parties directly affected.
- 4.59 In our advice to ministers we said that there would be merit in enabling 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. As set out in February, we believe 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 sufficient flexibility to ensure that there are no obstacles to such 'fine tuning'. The change mechanism will be consistent with this approach and we will make changes to the regulatory accounts so that any 'fine tuning' transactions relating to capex and the RAB can be separately identified.

- 4.60 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.
- 4.61 We intend to discuss the detailed features of the change process further in workshops and elsewhere before defining it in full in the PR08 final determination in October.

### **Business plan notice**

- 4.62 Condition 7 of Network Rail's network licence requires the company to prepare a business plan no later than 31 March each year. We must specify to Network Rail, by notice no later than the preceding 31 October, the format, structure and level of detail that we require the business plan to contain.
- 4.63 Network Rail's 2009 business plan should serve as the plan to describe how it will meet its obligations under the PR08 final determinations. The plan will therefore need to show how Network Rail will deliver the full range of outputs, both top level regulated outputs specified by us and disaggregated outputs determined by Network Rail after full consultation with its stakeholders.
- 4.64 We intend to ask Network Rail to publish the delivery plan no later than 27 February 2009. We will then need to assess it to ensure that it is consistent with our PR08 determination. If we believe that it is not consistent we will require the company to revise it accordingly.<sup>20</sup>
- 4.65 Our proposed notice is in annex B.

### **Environmental initiatives**

- 4.66 In publishing our sustainable development policy in April 2007 we emphasised the important role that the industry has to play in developing and maintaining a sustainable railway system and in promoting and enhancing the sustainable development 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.
- 4.67 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 outputs for Network Rail in CP4, although we will review this again for CP5.
- 4.68 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

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<sup>20</sup> 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.

non-track waste. These are worthwhile objectives and it is encouraging that Network Rail is formally setting itself measurable targets.

- 4.69 Network Rail's plans are not sufficiently developed to allow us to understand whether these targets are either realistic or challenging enough based upon the current baseline of activity. There are certain areas where we consider that Network Rail should be identifying initiatives to improve its, and the industry's, environment performance, such as improving fuel efficiency / CO<sub>2</sub> emissions associated with maintenance and renewal activity, the wider implementation of regenerative braking and the introduction of electricity metering, facilitating more efficient driving by train operators and climate change adaptation.
- 4.70 Network Rail told us that more information on such issues would be included in its SBP update, but the update did not include anything further. We are therefore currently unable to comment on the appropriateness of the targets outlined in the SBP.
- 4.71 That said, we will continue to critically monitor Network Rail's environmental performance against these (and other) initiatives through our assessment of its annual reports.



## 5. Maintenance and renewal expenditure

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### Introduction

- 5.1 This chapter sets out our assessment of the expenditure that Network Rail needs to maintain and renew the infrastructure assets during CP4. It explains how we made this assessment and gives our reasons for reaching this determination.
- 5.2 This part of the document is about *what* Network Rail will be funded to do. It focuses on the scope of its asset management programme and it discusses the volumes of work that we consider to be justified in CP4. 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 Of course it is then necessary to consider what these programmes should cost. All references to maintenance and renewal costs in this chapter are on the basis of 'pre-efficient' expenditure. This is what the work would actually cost at the start of CP4, taking fully into account the efficiency gains that will have been made by Network Rail by the end of CP3 but before any further adjustments are made to reflect the improvement in efficiency that we believe Network Rail can achieve as CP4 progresses. These are overlaid separately to reach our determination and are discussed in chapter 6.
- 5.4 We also set the CP4 figures in the context of an assessment of the necessary long-run average asset renewal expenditure over 35 years starting at CP4. This reflects the level of renewals that we believe would be required to sustain the long-term condition of the existing network. The long-run figures have been used to determine the amortisation allowance that forms part of the calculation of Network Rail's total revenue requirement.
- 5.5 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

- 5.6 For the network as a whole Network Rail has proposed pre-efficiency expenditure of £5.3bn on maintenance of the infrastructure 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: Breakdown of Network Rail’s CP4 pre-efficiency expenditure proposals**

(2006-07 prices)	Network Rail’s proposals for CP4	Comparison with CP3
<b>Infrastructure maintenance</b>		
Asset 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
<b>Renewals</b>		
<b>Track:</b> plain line, switch & crossing, drainage and off track works	£3,991m	Volumes 5 – 6% lower than in CP3
<b>Signalling:</b> 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
<b>Telecommunications:</b> 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
<b>Electrification:</b> AC & DC distribution and contact equipment & system control	£684m	Significantly higher than CP3 levels
<b>Civil engineering:</b> all works except routine inspection to bridges, tunnels, walls, earth structures, coastal defences etc.	£2,198m	Significantly higher than CP3 levels
<b>Operational property:</b> 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
<b>Plant &amp; machinery:</b> on track machinery and fixed plant	£402m	Slightly below CP3 levels
<b>Other renewals:</b> IT, corporate offices, miscellaneous schemes	£728m	Below CP3 levels

## Activity volumes

- 5.7 This assessment is not just about how much money should be spent. It is also about the activity volumes that we expect to be delivered in CP4 and the outputs that we expect to be achieved as a result.
- 5.8 We are not treating activity volumes as a formal regulated output, but as we explain in chapter 4 they will form an important element of our monitoring strategy in CP4. As the major source material for our assessment, Network Rail's strategic business plan obviously does not specify the detail of every activity to be undertaken through to 2013-14. We recognise that the actual volumes of work that will be delivered during CP4 are likely to vary from the business plan to some extent as Network Rail's planning processes reflect the evolving needs of its business during the course of the control period and as individual activities are specified, planned and executed.
- 5.9 However, we are clear that our determination should reflect the overall quantum of work and the spending priorities for Network Rail during CP4. As its asset management regime continues to mature it is reasonable to expect the company to be able to forecast its future workload with ever increasing precision and robustness. Therefore we do not expect to see major variances from the activity volumes set out in this chapter which are (with the exception of the civil engineering activities) clearly based on Network Rail's defined asset policies and are those required to manage the network on a sustainable long-term basis. We will assess Network Rail's CP4 delivery plan and monitor activity levels during the control period on this basis. Unless Network Rail can demonstrate a robust case that justifies significant variances, we will expect to see the cumulative measures of actual work done correlating closely with the forecast activity volumes that are set out in this chapter.

## Background

- 5.10 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.
- 5.11 Before taking efficiency into account, Network Rail's final submission in April 2008 set out CP4 expenditure plans of £12.9bn for renewals and £5.3bn for maintenance. This compares with the equivalent CP3 figures of £11.6bn and £5.9bn 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 it has delivered in the current control period, years in 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.

5.12 We discuss more about these issues in the rest of this chapter as we describe the assessment process we have followed and set out the reasons for our determination for each asset category.

## Methodology

5.13 Our assessment project consisted of structured programmes of analysis designed 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 of investigation:

- the quality of the asset policies being applied to determine the maintenance and renewal activities, and the justification for those policies in terms of the extent to which they demonstrate the efficient minimum whole life cost solution for managing the infrastructure;
- how the activity volumes have been determined – either by bottom-up specified items of work contained within planning 'workbanks' or (in the longer term) by the use of forecasting models. The infrastructure cost model (ICM) is the major source of activity forecasting;
- consideration of data quality as an influence upon the quality of activity forecasting;
- the efficiency of the activity costs used in the ICM to model the total expenditure requirements;
- the quality of the 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.

5.14 Most of our analysis was progressed through extensive 'challenge' sessions with Network Rail, designed 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 strategic approach put forward in the SBP. We conducted this process with our own in-house engineering expertise supported by a small technical panel of senior industry engineering experts and a number of specific consultancy studies.

5.15 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 as described in Chapter 6.

## Overview of findings

5.16 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 63% of total pre-efficiency renewals expenditure) fall within 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 (representing 18% of total pre-efficiency 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 the civil engineering expenditure plans, representing 15% of the total pre-efficiency renewals expenditure.

## Asset policies

5.17 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.

5.18 Detailed points about individual asset policies are discussed later. 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. Certain asset policies 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 particularly high.

5.19 However we remain disappointed that Network Rail has not made more progress in developing the life cycle cost analysis to support its policy choices in all asset categories. It has made a start but much 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 been able to establish clear, numeric analysis that unequivocally confirms the CP4 expenditure plans to be the most efficient, minimum whole life solution for Britain's railways.

## Infrastructure cost model

- 5.20 Network Rail's ICM has been a key tool. 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 time horizon of 40 years. A key feature of the ICM is that it translates Network Rail's asset policies into activity and expenditure projections.
- 5.21 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.
- 5.22 We asked the independent reporter, Halcrow, to complete an audit<sup>21</sup> of the model's computational accuracy. This uncovered no errors that materially impacted the overall SBP expenditure forecasts. It did however uncover several errors that affected the accuracy of model calculations, and Network Rail has corrected these in the version of the model accompanying the SBP update.

## Track renewals

### Overview

- 5.23 Network Rail has 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.
- 5.24 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 significantly to improve efficiency and productivity by 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.

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<sup>21</sup> *Audit of ICM v2*, Halcrow, March 2008. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/pr08-halcrowaudit-130308.pdf>

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

	<b>CP4 volume proposed by Network Rail</b>	<b>Average annual % of network renewed or treated</b>
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)

5.25 Network Rail proposes a significant increase in track drainage renewals, with total 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, and we have made no adjustments to this element of the proposed expenditure.

#### *Assessment*

5.26 Our assessment has investigated the case for funding track renewals at this level. 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, being 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;
- the forecasting of track renewal volumes in the ICM is generated by applying realistic typical service life assumptions. We have used the independent reporters and our expert technical advisers to review these assumptions and 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 any substantial errors in activity forecasting within the ICM;
- observed errors in earlier versions of the ICM have now been corrected. For example, the initial strategic business plan in 2006 overstated

renewals requirements on rural routes that can be effectively maintained, almost in perpetuity, through ongoing component replacement rather than large-scale renewals. The current version of the ICM now reflects more sensible asset management strategies for different types of route;

- 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.

### *Adjustments*

- 5.27 On this evidence we broadly endorse Network Rail's strategic track renewals plans. However in reaching our determination we have made some relatively minor adjustments in areas where we believe that Network Rail may have over-scoped the nature of the work in CP4 to some degree.
- 5.28 Although we are satisfied that the infrastructure cost model generates realistic forecasts of future renewal volumes, it does not distinguish between full or partial renewals of switches and crossings, for example. On the evidence we have gathered from our site inspections we believe that there is a tendency for Network Rail to over-specify some renewals proposals by opting for a more expensive full renewal rather than a partial renewal option. Even though the track asset policy precludes partial renewal of switch and crossing units on primary routes, we consider that there are locations on those routes where line speeds are relatively low (e.g. in station areas) and where a less expensive partial renewal could be an entirely appropriate solution.
- 5.29 We also consider that because the route categorisation used by Network Rail is very broad (the 'primary' category accounts for almost 40% of total track km.), there will be a tendency to apply policy decisions designed to meet the needs of the most critical and heavily used routes to parts of the network where traffic levels and utilisation are at the lower end of the same spectrum. This also implies that engineering interventions may be over-specified to some extent and not always deliver the minimum whole life cost solution.
- 5.30 In addition we are making some minor reductions to the volumes of track renewals proposed by Network Rail because we believe that:

- 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 longer asset lives;
- there are further opportunities to reduce the amount of rail renewal by applying more risk-based criteria for replacing older (pre-1975) rails on some of the lower category primary routes. We believe that some rail on such routes is being removed simply because the policy requires it, even though the defect history does not suggest it to be necessary; and
- improved rail grinding, wheel-rail lubrication and initiatives with train operators to improve the management of the wheel-rail interface of new, heavier rolling stock with stiffer suspensions should allow some reduction in the volume overlay assumed by Network Rail to reflect shortened rail life due to rolling contact fatigue.

- 5.31 A further reason for making some adjustment to Network Rail's planned volumes is the evidence that we have gathered from our site sampling of proposed track renewal works that have been fully specified and are already in the job workbanks for 2009-10.
- 5.32 In some of these cases we have concluded that Network Rail appears to be undertaking full scale track renewals a little too early. We do not believe that this reflects any major over-scoping of the total renewals requirements. In most cases any tendency to renew early may be measured in a small number of years and is unlikely to have a great impact on total CP4 volumes. However, we have also found some instances where our technical advisers have examined proposed track renewals and concluded that the work may be being planned at least a whole control period too early.
- 5.33 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. However, it has not been able to furnish any performance data or whole life cost analysis that justifies its proposals. In our view this reveals some tendency within Network Rail to opt for a renewals solution where a more cost effective maintenance regime is still viable.
- 5.34 The assessment we have made has led us to conclude that Network Rail's proposed expenditure on track renewals in CP4 is a little higher than strictly necessary with consistent application of good engineering judgment.

*Deliverability and efficiency*

- 5.35 Given that the proposed volume of track renewal in CP4 is rather less than current levels we have no reason to believe that there will be any resourcing issues that would constrain delivery during CP4.
- 5.36 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

- 5.37 We are reasonably satisfied that Network Rail's track renewal plans represent a sound policy application and an appropriate spread of activity that reflects the use, business requirements and drivers of maintenance and renewal cost across the network.
- 5.38 That said, we are disappointed that Network Rail has not been able to develop more of an analysis of life cycle costing to demonstrate clearly that its CP4 programme does represent the minimum whole life cost of track asset management. We consider that much more robust modelling still needs to be done to demonstrate clearly the optimum balance between ongoing maintenance and asset renewal for the future.
- 5.39 Without the availability of that evidence however, we are broadly content with the way in which the track renewal volumes for CP4 have been produced, and we are endorsing them with some relatively minor adjustments to reflect the assessment discussed in the previous paragraphs.
- 5.40 We have made a reduction of 5% in the volume of some plain line and switch and crossing renewal activities. We have not reduced the proposed volumes of ballast cleaning and drainage work.
- 5.41 On this basis we have concluded that the required pre-efficient level of expenditure for track renewals on the network during CP4 should be £3820m, a reduction of £171m on Network Rail's SBP figure.
- 5.42 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	3769 km
Switches & crossings	341 units (full renewal) 179 units (partial renewal)	1705 units (full) 895 (partial)

## Scotland

- 5.43 In reaching a view of the track renewals expenditure 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 £390m.
- 5.44 This expenditure 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 has been corrected. This error previously overstated renewals volumes in Scotland quite significantly, but we are satisfied that it no longer does so; and
  - work that we did in 2005 to calculate the disaggregated proportion of expenditure on the Scottish network showed that it has exactly 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 down 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, and even though we expect Scotland's track renewal volumes to stay quite steady in the future, reducing volumes elsewhere will mean that Scotland's percentage share is expected to rise above 10.2% in later control periods.
- 5.45 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 Network Rail to deliver 10.2% of the volumes shown in the above table.

## Civil engineering

### Overview

- 5.46 In its SBP, and again in the SBP 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 an increase of around 35% in the volume of renewals in CP4.
- 5.47 Such an increase would continue the trend apparent through the course of CP3. ACR03 increased funding for civil engineering asset renewals to begin to address historically inadequate levels of expenditure that we concluded would not be sufficient 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 are setting out our view on whether there is a case for increasing civil engineering activity still further.

- 5.48 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 the 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 proposes to increase this element of expenditure by 44% in CP4. Taking efficiencies already delivered into account, we estimate this to represent a 50% increase in activity volumes.
- 5.49 Of the remainder of the expenditure proposed, overbridges account for a further 16%, earthworks (cutting slopes and embankments) for 17% and tunnels and major structures for a further 7% each. The balance is allocated to footbridges, retaining walls, drainage culverts and coastal defences.
- 5.50 Although Network Rail has proposed a significant increase in overall expenditure, it proposes to manage its earthworks in CP4 at a lower level of expenditure (a 19% reduction from CP3 levels).

#### *Key issues*

- 5.51 The key issue has been to understand the strength of Network Rail's case for requiring a further increase in activity volumes. In assessing Network Rail's case for such a change we would obviously expect to find significant evidence of poor condition and capability restrictions widely affecting the problem with metal underbridges that has been highlighted.
- 5.52 We have examined the robustness of the modelling methods that have been used to support the SBP. We have also used performance indicators and site observations to assess the overall effect of the increased levels of expenditure during CP3 and hence to judge the extent to which we believe Network Rail has moved towards delivering a steady state management regime for structures.

#### *Network Rail's case*

- 5.53 Network Rail has essentially continued to apply the policy approach that was first used to inform our ACR03 conclusions. The basic principles remain the same, although in practice there has been some modification to the detailed wording of the two key asset management policies – policy B and policy C.
- 5.54 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 has modelled its costs on the basis that this approach should be used to manage structures on all primary, secondary and London & south east routes.



- 5.55 Policy C defines a less onerous asset management 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 has modelled its costs on the basis that this approach should be used to manage structures on rural and freight only routes.
- 5.56 We have examined this issue in depth because the precise definitions of the two policies have a major influence on the scope and timing of Network Rail’s proposed activities – and hence the overall expenditure required in CP4.
- 5.57 Network Rail has also undertaken considerable development of its structures modelling tool CECASE (Civil Engineering Cost and Strategy Evaluation). This has been extended to model a much greater proportion of the structures portfolio than was the case with 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.
- 5.58 CECASE forecasts network-wide activity volume by extrapolating from a number of 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 upon 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.
- 5.59 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.

### *Assessment*

- 5.60 We have examined Network Rail’s case at length and in depth. As we have noted in previous reviews of the expenditure required for the civil engineering portfolio, 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 confirm our view that Network Rail should continue to improve and refine it for the future.

- 5.61 At this stage, however, we retain concerns about the statistical accuracy of the outputs from this model. We tasked the independent reporter to review this issue, and this assessment suggested that the overall tolerance of the model is in the range of +/- 15 to 20%.
- 5.62 We also remain 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.
- 5.63 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 to be necessary for us to be able to treat its outputs with sufficient certainty.
- 5.64 We are also unconvinced by the use of a very small sample of SCMI scores to justify a major increase in a programme of work to 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 be imprudent to justify a major increase in expenditure.
- 5.65 In reaching these views, we have been careful to examine the evidence of what has actually been occurring 'on the ground' as a result of the existing funding of repairs and renewals of structures. 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.
- 5.66 A number of other elements of expenditure are also modelled in CECASE and have also been reduced from the SBP figures in our conclusions, on the basis that Network Rail has not made a case to justify any increase above existing levels. 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 made an error in modelling a significantly higher number of footbridges than are actually in the civil engineering portfolio (double-counting many station footbridges that are considered as part of the operational property portfolio). Allowing for this error, the proposed expenditure per footbridge is on a par with underbridges. We can see no justification for this; 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. Note that this decision does not reduce funding for culvert *clearance*, which is included as 'other' expenditure.

5.67 In other cases (e.g. tunnels and major structures) the SBP figures are not modelled in CECASE and 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*

5.68 For those asset types where the SBP is based on bottom-up assessment (major structures, tunnels, footbridges, 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.

5.69 For the other asset types where the SBP relies on CECASE modelling, we have taken a different approach. Given that (a) we still have significant concerns about the modelling basis for these proposals and (b) we believe the evidence points towards the sufficiency of existing levels of structures funding, within which Network Rail has been delivering improvements in the overall condition of structures, we find no case to support a further increase in expenditure beyond the exit level at the end of the current control period.

5.70 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.

5.71 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.

- 5.72 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.
- 5.73 We have therefore concluded that funding for structures expenditure should be as set out in table 5.4.

**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
<b>Total</b>	<b>1,766</b>	<b>2,198</b>	<b>1,895</b>	<b>1,505</b>	<b>390</b>

\* At emerging efficiency levels – not directly comparable to CP4 figures

*Scotland*

- 5.74 In reaching a determination for Scotland we have used the modelled CECASE distribution of expenditure across the network and have applied this to our conclusions on the appropriate total expenditure.
- 5.75 Scotland's share of total CP4 expenditure on civil engineering on this basis 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%.
- 5.76 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 renewals

### Overview

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

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

Activity	Pre-efficient expenditure proposed by Network Rail (SBP) (£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%
<b>Total</b>	<b>£2,565m</b>	<b>100%</b>

5.78 Just over half of the expenditure is for the planned renewal of 5971 signalling equivalent units (SEUs).<sup>22</sup> Most of this is complete renewal of interlockings, 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

<sup>22</sup> 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.

*Key issues*

- 5.79 CP4 funding of ERTMS 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 one of the key issues 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.
- 5.80 The renewals programme only represents part of the overall signalling workload in CP4. The scale of the network enhancement programme is very significant. When combined with the renewals programme the volume of signalling work in CP4 increases to 9680 SEUs with annual activity levels in a range between 1600 and 2400 SEUs. The peak is expected to occur in 2011-12. One of the key issues for CP4 is therefore the deliverability challenge that this volume of work poses to Network Rail and its suppliers.

*Assessment*

- 5.81 Unlike other asset types, the forecasting of signalling renewal volumes is not reliant upon statistical modelling. In its SICA (Signalling Infrastructure Condition Assessment) tool Network Rail has 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.
- 5.82 We reviewed this process in detail during the course of the medium term signalling review<sup>23</sup> 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.
- 5.83 With the move to ERTMS implementation expected to gather pace during CP4, 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 that (a) the total SEU volumes for conventional renewals reflect a necessary and realistic plan, and (b) that partial renewal volumes and life extension activities reflect sensible proposals to maintain the condition and performance of the signalling infrastructure on

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<sup>23</sup> *Signalling Review: final conclusions of the medium-term review*, Office of Rail Regulation, December 2005. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/269.pdf>

those routes where ERTMS is due for early completion and hence where full scale conventional renewals would be inappropriate.

- 5.84 The SEU unit rate used to cost these plans in the infrastructure cost model reflects the progress that Network Rail has made during CP3 to reduce the unit costs of signalling renewals.
- 5.85 With regard to the ERTMS programme, we have been monitoring closely as Network Rail, with key stakeholders and the wider railway industry, has been developing the ERTMS business case and implementation plans. We are satisfied that the SBP represents a realistic projection of expenditure in CP4.
- 5.86 Network Rail has recently improved its knowledge about the condition of level crossings on the network, and it has improved 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.
- 5.87 Minor works and life extension schemes account for almost one fifth of the total signalling renewals expenditure proposed by Network Rail in its SBP. 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 the costing of minor works. We stated that: “we expect Network Rail will have improved the consistency and transparency of its planning processes in time for the long-term review”.
- 5.88 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 the activities within this category. When we challenged this, Network Rail reviewed the plans it had set out 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*

- 5.89 On the basis of this assessment we are satisfied that Network Rail has provided substantial justification for the scope of the signalling renewal works that it has costed in its SBP. As noted, the one area where we consider it has failed to justify its plans is in the area of minor works and life extension schemes. However, in reaching our conclusions we have taken into account the fact that (a) we sampled these activities in the medium term signalling review during 2005 and established reasonable confidence that the volumes at that time were justified and represented work that needed to be done to maintain the safety and performance of the network, and (b) these activities in CP4 remain consistent with the final years of CP3.
- 5.90 In considering the key issue of deliverability we have taken two factors into account. We have recognised the scale of the challenge to the resources of

Network Rail and the supply industry that is represented by the combined signalling renewals and enhancements programmes. We have also noted that Network Rail has consistently under-delivered on its planned delivery volumes during CP3 – indeed, the CP4 activities include some signalling renewals that have been deferred from the current control period. Despite such slippage in the timing of renewals, Network Rail has been able to continue to reduce the number of failure incidents involving signalling equipment.

- 5.91 We consider it likely that Network Rail may need to make some further deferrals of signalling renewal projects during CP4, not least because we expect it to have learned lessons about avoiding over-extending its resources following recent well-publicised project overruns.
- 5.92 Given these considerations, we have concluded that it is appropriate to make a determination that reflects a marginal reduction of 5% in the 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.
- 5.93 This 5% reduction in the scope of conventional signalling renewals 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.
- 5.94 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
<b>Total</b>	<b>2,565</b>	<b>2,454</b>



*Scotland*

- 5.95 We have assessed the total signalling renewals expenditure in Scotland during CP4 to be £164m, 6.9% 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 that make CP4 a natural low point in the profile of renewals in Scotland. In its SBP Network Rail proposed to renew a total of 199 SEUs in Scotland.
- 5.96 In future control periods we expect this balance to change substantially. Our long run calculations have determined 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*

- 5.97 Network Rail proposed a pre-efficiency CP4 expenditure of £887m in its SBP. This is less than the £1.02bn that we expect it to have spent in CP3 because major renewals programmes (replacement of the fixed telecoms network, FTN and development of the mobile communications network GSM-R) are both due to be completed during CP4.
- 5.98 The FTN and GSM-R projects account for two-thirds of proposed telecoms expenditure in CP4 (£594m pre-efficiency). Both projects are well established and have been the subjects of previous efficiency reviews. The remainder of the telecoms expenditure is divided between station information and security systems, driver-only CCTV, cables and cable routes, telephone concentrators and voice recorders.
- 5.99 Network Rail's expenditure on GSM-R includes the funding of train cab fitment, and this division of responsibility between Network Rail and its customers gives us some concern that it is difficult to optimise cost efficiency. Under its franchise agreement South West Trains has responsibility for funding cab fitment rather than Network Rail, but this assessment makes no adjustment for any other such arrangements elsewhere on the network.
- 5.100 As the GSM-R project has progressed there have been a number of scope changes that have influenced overall project costs. One such is the decision to reduce the height of the communication masts, which had the effect of increasing the total number of masts to provide full coverage.

*Assessment*

- 5.101 In our review of Network Rail's SBP 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 minor adjustment to the proposed expenditure on concentrator renewals.

5.102 We have not made any other adjustments to Network Rail's expenditure proposals.

### Conclusions

5.103 With the minor adjustment outlined above, we have set the pre-efficiency funding for telecom renewals at £870m. This funds in full Network Rail's plans for completing the renewal of the fixed telecoms network and the commissioning of GSM-R during CP4.

5.104 The proportion of this expenditure in Scotland is £113m, amounting to 12.9% 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 a realistic level of funding for the Scottish network, given that GSM-R will require a greater volume of infrastructure than the present telecoms provision (NRN).

## Operational property

### Overview

5.105 In the SBP update Network Rail proposed pre-efficiency expenditure of £1480m for the 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 and illustrates how station property accounts for much the largest part (85%).

**Table 5.8: SBP update: proposed pre-efficiency operational property renewals**

(2006-07 prices)	SBP update proposal	% of total
Managed stations	£483m	33%
Franchised stations	£767m	52%
Light maintenance depots	£73m	5%
Lineside buildings	£89m	6%
National distribution depots	£4m	0.2%
Maintenance unit buildings	£64m	4%
<b>Total</b>	<b>£1,480m</b>	<b>100%</b>

5.106 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.

- 5.107 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 common 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.
- 5.108 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, and to demonstrate for the first time that it is doing so for each category of station (categories A to F). It must do this before taking into account improvements which will be funded through the National Stations Improvement Programme (NSIP) in England & Wales.
- 5.109 In putting forward its plans to achieve this, Network Rail has consistently said that 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*

- 5.110 Our assessment of Network Rail's plans 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.
- 5.111 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.
- 5.112 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 of the operational property portfolio rather than meeting the requirement to maintain it at a steady state level.

- 5.113 We were also concerned about the quality of the data used to model the future activity levels proposed by Network Rail in its 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.
- 5.114 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.

### *Conclusions*

- 5.115 Given the scale of the issues arising in our review of the SBP we conducted extensive independent assessments of the maintenance, repair and renewal expenditure requirements to maintain steady state condition. These have enabled us to endorse the amended expenditure plans put forward by Network Rail in the SBP update.
- 5.116 For the 18 major stations managed directly by Network Rail (the 'managed' stations) the CP4 expenditure plan is dominated by major renewals projects at Kings Cross, Paddington, Victoria and Edinburgh Waverley. Three of these are continuations of work that commenced in CP3. Having examined the plans for these works 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.
- 5.117 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 to be appropriate.

- 5.118 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.
- 5.119 There is a more modest increase (in the order of 6.5%) 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. As a result of these improvements, and with the assurance provided by our own calculations, we have been able to determine a pre-efficiency steady state expenditure figure for franchised stations of £767m. We believe this funding enables the portfolio of franchised stations to be managed at steady state condition.
- 5.120 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, and examined how Network Rail has adjusted a number of its forecasts in the SBP update.
- 5.121 One of the most significant adjustments is an increase in activity volumes and expenditure on the maintenance and repair of light maintenance depots. Network Rail has suggested that the overall reduction in equivalent activities at franchised stations has freed resources to allow the volume of work at light maintenance 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. We have accepted the proposed expenditure on lineside and other buildings 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

<b>Total</b>	<b>336.5</b>	<b>328.5</b>	<b>297</b>	<b>270</b>	<b>248</b>	<b>1,480</b>
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5.122 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.

### *Scotland*

5.123 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
<b>Total</b>	<b>52</b>	<b>65</b>	<b>54</b>	<b>53</b>	<b>27</b>	<b>251</b>

5.124 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 clearly that:

- one single 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.

5.125 Beyond CP4 the expenditure on managed stations is expected to reduce very significantly, and this should return the proportion of Scottish expenditure to more stable long term percentages.

## Electrification renewals

### Overview

5.126 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.

5.127 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.

**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%
<b>Total</b>	<b>684</b>	<b>100%</b>

5.128 The final pre-efficiency figure for electrification renewals set out in the SBP update was £684m, made up as shown in table 5.11. This represents close to a doubling of the total spending in CP3.

### *Assessment*

5.129 In assessing these plans we found that there was robust justification for almost all of the proposed expenditure, and our determination endorses Network Rail's plans with very minor adjustments.

5.130 In respect of the plans for renewal of overhead line equipment we have reviewed and accepted (a) the business case for major renewal on the Great Eastern main line, and (b) 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.

5.131 We consider that there is also strong justification for the scope of planned renewals of the older elements of the AC and DC distribution systems. We accept Network Rail's proposals to replace most of the oil filled switchgear and high voltage cables during the course of CP4. Almost all of these assets are more than 40 years old, exceeding health and safety guidance on the expected serviceable life of such equipment and posing an increasing performance and safety risk if they are not replaced. This determination therefore provides in full the funding Network Rail has proposed, in order to:

- replace approximately 150 high voltage oil filled switchgear units in each year of CP4 on both the DC and AC networks. This is intended to result in the virtual elimination of this equipment, leaving only a small population of indoor units to be replaced in later control periods;
- commence a programme of mid life refurbishment of the newer types of DC switchgear such as vacuum filled and SF6/GIS units;
- maintain a steady rate of renewal of approximately 180 units of DC low voltage switchgear each year;
- increase the rate of renewal of high voltage oil filled DC cables in each year of CP4, from the current rate of 20km per annum at the end of CP3 to almost 60 km in 2013-14;
- continue with steady state renewal of low voltage DC cables at the rate of 125 km each year; and
- continue with a programme of renewing transformer rectifiers to significantly reduce the age profile of this equipment by the end of CP4.

5.132 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 made any adjustments to this figure in our conclusions.

### *Conclusions*

- 5.133 Other than in two areas we accept Network Rail's plans for the renewal of electrification equipment in CP4.
- 5.134 Our first adjustment is a reduction in the provision for painting overhead line masts. Network Rail has proposed to build up a painting programme from nothing at the start of CP4 to almost 5000 masts a year by 2013-14. However it has provided little justification, and no condition information, to support this proposal. We are also concerned that there could be a disproportionate effect of this work requiring extensive electrical isolations on key routes such as the West Coast main line; if this work is considered to be vital it should at least have commenced in CP3 when there were engineering possessions to accommodate it on the West Coast.
- 5.135 Our other adjustment is to exclude funding for upgrading the electrical grid supply point at Elvanfoot on the West Coast main line, which we believe is included in the CP4 enhancement funding provision for the West Coast Route Modernisation (see chapter 9). We have deducted a pre-efficient figure of £10m to reflect this conclusion.
- 5.136 This determination therefore provides for pre-efficiency funding of £664m for the whole network. We expect Network Rail to deliver the activity volumes that it set out in its SBP and that are partly summarised above.

### *Scotland*

- 5.137 The proportion of electrification expenditure in Scotland in our assessment is £53m, 8% of the network total.
- 5.138 This is below the analysis of the disaggregated expenditure on the Scottish network that we undertook in 2005, in which we calculated that 10.2% of the electrification assets were on the Scottish network. However, we are satisfied that the lower proportion in CP4 does not reflect any long term under-investment in the electrified network. Beyond CP5 our long-run expenditure assessment returns expenditure in Scotland to approximately 10%.
- 5.139 The removal of the proposed grid supply point renewal expenditure at Elvanfoot is all expenditure removed from the Scottish total. We re-iterate that we do not believe this item should be included as renewal expenditure, for the reasons outlined above.

## **Plant and machinery**

### *Overview*

- 5.140 The plant and machinery category encompasses a diverse range of fixed and mobile equipment, for which Network Rail put forward a pre-efficiency

expenditure proposal 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%
<b>Total</b>	<b>402</b>	<b>100%</b>

### Assessment

- 5.141 Expenditure on plant and machinery is a key enabler for Network Rail to continue to improve important aspects of its performance.
- 5.142 We note that the largest element of this expenditure is the further funding of high output machinery for the maintenance and renewal of the network, supported by investment in the fleet for delivery of engineering materials around the network. We consider these to be important items of expenditure that will deliver further changes to the efficiency and productivity with which Network Rail carries out engineering work on the network.
- 5.143 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

- 5.144 We have made one very minor adjustment to Network Rail's expenditure plans for CP4. We have reduced its pre-efficiency expenditure plan from £402m to £394m. This £8m reduction is in the figure for investing in fixed plant, and the adjustment effectively removes a sharp increase in expenditure proposed in 2013-14. When challenged Network Rail was unable to explain why this increase was necessary.

5.145 In all other respects we endorse Network Rail’s planned expenditure on fixed plant and machinery.

*Scotland*

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

**Other renewals**

*Overview*

5.147 In Network Rail’s SBP and SBP update this category includes a diverse range of expenditure. The SBP update gives a pre-efficiency expenditure of £728m for the whole network, broken down as shown table 5.13.

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

£m (2006-07 prices)	SBP update	% of total
Information technology and corporate offices	564	77%
Committed ‘discretionary’ schemes	85	12%
Other miscellaneous schemes	79	11%
<b>Total</b>	<b>728</b>	<b>100%</b>

*Conclusions*

5.148 The largest items included in this category of expenditure are information management and corporate accommodation.

5.149 The SBP includes a number of projects intended to deliver improvements in business performance and/or efficiency. We have discussed these with Network Rail on a number of occasions, in particular their information management proposals. Generally, Network Rail has not supported its proposals with robust business cases that evaluate the costs and benefits of the projects.

5.150 We agree that information management spend on appropriate projects will be necessary to enable Network Rail to achieve efficiencies. We have made our own bottom up analysis of Network Rail’s proposals and have adjusted their expenditure figures for a number of reasons:

- since a number of these projects are not yet well-defined, it is reasonable that Network Rail’s risk analysis has a relatively wide range for their costs.

However in some cases we believe that too cautious a view has been taken and we made small reductions to the figures; and

- because we consider that some expenditure can be deferred into CP5.

5.151 We are confident that our conclusions provide Network Rail with reasonable funding for CP4, given the uncertainty, and particularly as some of the projects we have excluded from our assessment can, if necessary, be dealt with through the investment framework or the logging-up mechanism.

5.152 The ‘discretionary’ renewals 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 stated that it had abandoned its original proposals for the fleet engineering centre. We have therefore reduced the figure in our determination by £17m. We have not made any other adjustments.

5.153 Our overall conclusions for this category are shown in table 5.14.

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

£m (2006-07 prices)	Our conclusion	% of total
Information technology and corporate offices	340	70%
Committed discretionary schemes	68	14%
Other miscellaneous schemes	79	16%
<b>Total</b>	<b>487</b>	<b>100%</b>

## Maintenance

### Overview

5.154 Network Rail has proposed pre-efficiency expenditure of £5311m on infrastructure maintenance in CP4. This is below the expected total of £5859m in CP3.

5.155 The ICM has made good progress in providing a detailed breakdown of maintenance expenditure at a disaggregated route segment level. As the following table shows, almost two-thirds of these costs are identified as the ‘core’ maintenance activities on track, signalling, electrification, telecoms and plant and machinery assets. Within each of these categories we have been able to examine a further detailed level of breakdown showing the volumes of individual activities profiled annually through CP4. For example, track maintenance costs can be modelled to reflect reducing requirements for interventions as track is renewed.

- 5.156 The remaining one third of maintenance expenditure is classed as indirect and other costs. These have been calculated and then spread across route segments, in contrast with the build up of activity-based direct costs. They comprise the indirect accommodation and staffing costs, utility supply costs, engineering train haulage of materials and the £40m per annum inspection costs of the civil engineering structures portfolio.
- 5.157 Other noteworthy elements of this 'other' expenditure line are the additional maintenance costs associated with the revised access regime on the West Coast main line (£35m per annum), and a total incremental figure of £18m in Scotland for the whole of CP4, based on the additional maintenance required on enhanced infrastructure in Scotland.
- 5.158 Table 5.15 shows the breakdown of this figure based upon the output of the infrastructure cost model.

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

£m (2006-07 prices)	SBP update	% of total
<b>Core maintenance</b>		
Track	2164	41%
Signalling	647	12%
Electrification	179	3%
Telecoms	316	6%
Plant & Machinery	77	1%
<b>Core maintenance sub-total</b>	<b>3,383</b>	<b>64%</b>
Indirect costs	945	18%
Other costs	983	19%
<b>Total</b>	<b>5,311</b>	<b>100%</b>

### *Assessment*

- 5.159 Although the ICM provides much greater visibility of the maintenance activity levels on a route segment basis, it remains much more difficult to assess and evaluate the justification for individual maintenance activity volumes (many of which are essentially reactive) than it is for renewal activities that are generated by modelling of asset age, service lives etc.
- 5.160 Furthermore, Network Rail has developed significant efficiency proposals for maintenance expenditure itself, many of which are based on expected changes in activity volumes as maintenance productivity is improved through the course of CP4.

## Conclusions

5.161 For this reason we have not made any further scope changes to the maintenance activity volumes that are represented by Network Rail's own expenditure proposal and supported by information within the ICM. Our assessment of the potential for efficiency improvements in maintenance will cover both 'unit cost' and 'scope' efficiencies under this heading.

5.162 This determination therefore provides for maintenance funding in full as set out in the above table, ie. £5311m pre-efficiency for the whole network.

5.163 For Scotland the maintenance expenditure is calculated to be £524m, which equates to 9.8% of the network total. The breakdown of this expenditure is shown in table 5.16.

**Table 5.16: Network Rail's proposed pre-efficiency expenditure on maintenance in Scotland**

£m (2006-07 prices)	SBP update	% of total
<b>Core maintenance</b>		
Track	211	40%
Signalling	60	11%
Electrification	26	5%
Telecoms	35	7%
Plant & Machinery	7	1%
<b>Core maintenance sub-total</b>	<b>339</b>	
Indirect costs	91	18%
Other costs	94	18%
<b>Total</b>	<b>524</b>	<b>100%</b>

## Long run renewals

5.164 We have made an assessment of the average (pre-efficiency) renewals expenditure that Network Rail would have to achieve over the 35 years starting with CP4 to maintain the network on a sustainable basis. This assessment is necessary because the long life of rail assets means that expenditure on renewals in any given control period can be unrepresentative of the long-run average, which is the basis on which we have said we will

calculate amortisation provisions. In making this assessment we have drawn on the SBP and SBP update.

5.165 Tables 5.17 and 5.18 compare this long run average expenditure with our assessment of the average annual expenditure needed in CP4 and comment on significant differences.

**Table 5.17: Our assessment of CP4 and long-run renewals (network total)**

£m (2006-07 prices)	CP4 average	35 year average	Comments
Track	764	600	Age profile driving increased renewals in CP3 and CP4
Civil engineering	379	359	
Signalling	491	494	
Telecoms	174	116	GSM-R/FTN concluded in CP4
Operational property	296	257	Major station roof renewal in CP4 at four sites
Electrification	135	72	GE mainline renewal included in CP4
Plant and machinery	79	24	Purchase of high output plant in CP4

**Table 5.18: Our assessment of CP4 and long-run renewals (Scotland)**

£m (2006-07 prices)	CP4 average	35 year average	Comments
Track	78	72	
Civil engineering	78	70	Driven by major structures expenditure in CP4
Signalling	27	53	
Telecoms	23	17	
Operational property	50	31	Roof renewal at Edinburgh Waverley in CP4
Electrification	13	7	
Plant and machinery	8	8	

## Summary

5.166 Tables 5.19 and 5.20 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 5.19: Total renewals and maintenance expenditure in CP4 (Great Britain)**

£m (2006-07 prices)	Network Rail SBP update	ORR assessment
<b>Renewals</b>		
Track renewals	3,991	3,820
Signalling renewals	2,565	2,454
Civil engineering	2,198	1,895
Operational property	1,480	1,480
Electrification renewals	684	664
Telecoms	887	870
Plant & machinery	402	394
IT & corporate offices	564	340
Discretionary investment	85	68
Other renewals	79	79
<b>Total renewals</b>	<b>12,935</b>	<b>12,064</b>
Maintenance	5,311	5,311
<b>Total M&amp;R</b>	<b>18,246</b>	<b>17,375</b>



**Table 5.20: Scotland renewals and maintenance expenditure in CP4**

£m (2006-07 prices)	Network Rail SBP update	ORR assessment
<b>Renewals</b>		
Track renewals	407	390
Signalling renewals	170	163
Civil engineering	433	390
Operational property	251	251
Electrification renewals	64	53
Telecoms	114	113
Plant & machinery	39	38
IT & corporate offices	52	30
Discretionary investment	7	6
Other renewals	7	7
<b>Total renewals</b>	<b>1,545</b>	<b>1,441</b>
Maintenance	525	525
<b>Total M&amp;R</b>	<b>2,070</b>	<b>1,966</b>



## 6. Operating expenditure

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### Introduction

- 6.1 This chapter summarises our assessment of Network Rail's 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, or no, 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. However, it is difficult to assess opex activity volumes. Therefore, as with maintenance, the principal focus of our review of opex has been on the opportunities to improve overall efficiency, and our assessment of opex efficiency 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.
- 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 ISBP. 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. 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.

### Assessment of the SBP

- 6.7 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 have carefully reviewed the company's SBP forecasts and consider that it has the following shortcomings:

- generally, Network Rail has 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 numbers included in the SBP and the ISBP and it had not fully reconciled the 2007-08 budget included in the SBP to actual expenditure in 2006-07<sup>24</sup> or explained the variances;
- Network Rail has not yet 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
- it is not clear that the overhead and project engineering costs transferred out of opex in the SBP are consistent with the overhead and project engineering assumptions in the maintenance, renewals and enhancement unit costs used for the SBP; and
- Network Rail has not justified the efficiency assumptions it has applied to opex.

6.8 Following our initial review of the SBP we engaged consultants to support us in our assessment of opex. Consequently, we did not ask Network Rail to do any specific further work for its SBP update. Therefore, in the SBP update there are only very minor changes in the company's overall forecasts.

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

## Non-controllable opex

6.10 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 the February 2007 advice to Ministers.<sup>25</sup>

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<sup>24</sup> Network Rail has recently sent us analysis of the differences between the 2007-08 budget and actual 2006-07 expenditure, which we are reviewing and, as appropriate, will take account of in our final determinations.

<sup>25</sup> *Periodic Review 2008 (PR08): The treatment of risk and uncertainty*, Office of Rail Regulation, 28 September 2006. This may be accessed at <http://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 <http://www.rail-reg.gov.uk/upload/pdf/316.pdf>.

- 6.11 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.
- 6.12 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.
- 6.13 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.
- 6.14 For British Transport Police costs, we set out in our advice to ministers in February 2007, that we would provide an ex ante allowance with the risk taken by Network Rail.
- 6.15 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 after our PR08 final determinations are published. Therefore, we will assume an ex ante forecast in Network Rail's CP4 allowed revenue and log up/down any 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 and we will review this assumption for our final determinations.
- 6.16 As we have said in previous documents, our fee will be passed through. Our current estimate of Network Rail's share of these costs is £17m per annum (in 2006-07 prices). We will set an ex ante allowance for the Rail Safety and Standards Board levy and Network Rail will take all the risk, our latest estimate of this cost is £9m per annum (in 2006-07 prices).

6.17 Network Rail is protected against changes in traction electricity costs, since the costs are recovered from train operators. This protection is provided through the new traction electricity charge arrangements (explained in chapter 19), agreed between franchised passenger operators and Network Rail, (effective from 1 April 2007). This is because a wash-up adjustment is made to the final traction electricity charges, where actual costs to Network Rail differ from expected cost. While freight operators are not currently part of this approach, Network Rail are still protected from changes in cost for freight operators through the arrangements with franchised passenger operators, i.e. if the charge to freight operators for traction electricity was lower than costs, the passenger wash-up adjustment would resolve this and Network Rail would recover all its costs.

6.18 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	53	53	53	53	53	267
Cumulo rates	69	87	91	91	91	430
Traction electricity (EC4T)	179	182	188	196	201	946
Railway safety charge	9	9	9	9	9	46
Regulator fee	18	17	17	17	17	86
Other	0	0	0	0	0	2
<b>Total non-controllable opex</b>	<b>328</b>	<b>349</b>	<b>360</b>	<b>367</b>	<b>372</b>	<b>1,776</b>

### Allocation/attribution of costs to Scotland

6.19 In our advice to ministers in February 2007 we said that Network Rail could improve the approach it used to allocate and attribute opex costs to Scotland. In particular, we considered that Network Rail was allocating too much of its GB-wide/headquarters costs between England & Wales and Scotland using relatively simple metrics such as train miles or headcount instead of directly attributing them.

6.20 Since then Network Rail has said that the amount of directly attributed costs has fallen 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 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

- 6.21 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 2007-08 other operating income was £90m.
- 6.22 In its SBP, Network Rail reduced these costs 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. 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.
- 6.23 We consider that it is more appropriate to assume that this income would not materially change from the current levels. Using this approach gives a lower controllable opex requirement of £57m over CP4 when compared to Network Rail's forecast. As we are applying an overall efficiency assumption to controllable opex we have not adjusted for this difference.





## 7. Efficiency assessment

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### Introduction

- 7.1 This chapter sets our assessment of Network Rail's efficiency proposals and explains the work we have done ourselves to determine the scope for potential 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.

### Context

- 7.3 Our determinations must provide strong incentives on Network Rail to strive for continuous and sustained improvements in efficiency. 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.
- 7.4 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 only efficiency in OM&R.
- 7.5 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;<sup>26</sup> 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.

- 7.6 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.
- 7.7 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 has not been as rapid, and the coverage of the cost base as comprehensive, as we expected.
- 7.8 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. Therefore, as long as Network Rail delivers its output obligations in CP4 and/or 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.
- 7.9 Having said this, given the amount of work that has gone into assessing the renewals activity levels Network Rail has proposed for CP4, in conjunction with its asset policies, we would expect these already to incorporate most of the potential for further scope efficiency. We will continue to assess the cost reductions Network Rail achieves each year in line with our underspend framework 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

- 7.10 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 drive being the urgent need to address the significant increase in unit costs following the Hatfield derailment.

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<sup>26</sup> 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.

- 7.11 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 three years of CP3 suggested that it was broadly on target to achieve this level of efficiency improvement.<sup>27</sup> However, our preliminary assessment of Network Rail's efficiency performance in 2007-08 suggests that the company is now slightly behind the ACR03 target.
- 7.12 In its SBP Network Rail set out its expected level of efficiency improvement in CP3. The company said it would achieve 30% 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 28%. Table 7.1 shows Network Rail's projected cumulative efficiency improvement in CP3 along with the assumptions we made at ACR03. As we explain further below, this underperformance is taken into account in our judgement of the scope for catch-up, since this is based on Network Rail's expected CP3 outturn position. If we become aware of any material change (either worsening or improvement) between our draft and final determinations we will amend the starting position for CP4 accordingly.

**Table 7.1: CP3 cumulative efficiency improvement**

	2004-05 (%)	2005-06 (%)	2006-07 (%)	2007-08 (%)	2008-09 (%)
<b>Controllable opex</b>					
ACR03 final conclusions	6	15	22	26	30
Network Rail (SBP update)	16	24	25	26	29
<b>Maintenance</b>					
ACR03 final conclusions	8	15	22	28	34
Network Rail (SBP update)	10	19	26	30	35
<b>Renewals</b>					
ACR03 final conclusions	6	15	22	26	30
Network Rail (SBP update)	8	15	23	21	26
<b>Total</b>					
ACR03 final conclusions	8	15	22	27	31
Network Rail (SBP update)	10	18	24	25	28

<sup>27</sup> Chapter 8 of our annual assessment provides further details: *Annual Assessment of Network Rail 2006-07*, Office of Rail Regulation, September 2007. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/339.pdf>.

## Network Rail's proposals for CP4

- 7.13 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.<sup>28</sup> 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);
  - 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 emerging views on the scope for efficiency which we set out in our update on the framework for setting outputs and access charges in February 2008: the BSL international benchmarking assessment and the LECG study on the scope for efficiency gains in CP4.
- 7.14 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 proposals are shown in table 7.2. The company's 'net' efficiency proposals are approximately 12.5% (weighted across OM&R).

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<sup>28</sup> 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/asp/4352.aspx>.

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

	2009-10 (%)	2010-11 (%)	2011-12 (%)	2012-13 (%)	2013-14 (%)	CP4 (%)
<b>Gross efficiency</b>						
Controllable opex	5.0	5.0	4.0	3.0	2.0	<b>17.6</b>
Maintenance	5.0	5.0	4.0	3.0	2.0	<b>17.6</b>
Renewals	5.0	5.0	4.0	3.0	2.0	<b>17.6</b>
<b>Input price inflation (above RPI)</b>						
Controllable opex	2.3	2.3	1.1	1.1	1.1	<b>8.1</b>
Maintenance	2.0	2.1	1.3	0.5	0.5	<b>6.6</b>
Renewals	0.9	1.4	0.8	0.1	0.2	<b>3.5</b>
<b>Net efficiency (gross efficiency less input price inflation)</b>						
Controllable opex	2.1	2.2	1.6	1.1	0.6	<b>7.4</b>
Maintenance	3.1	3.0	2.7	2.5	1.5	<b>12.2</b>
Renewals	4.1	3.7	3.2	2.9	1.8	<b>14.8</b>

7.15 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
<b>Gross efficiency</b>	<b>17.6</b>	<b>17.6</b>	<b>17.6</b>

7.16 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 is now projecting. This effectively increases the company's projected gross renewals efficiency improvement in CP4 from 17.6% to 19.1%

## Our work to develop our efficiency judgements

7.17 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, 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 the Railway Industry Association (RIA). We have considered all this evidence in making our judgements; and
- **input prices:** we have considered the appropriate treatment of input prices and undertaken a review of Network Rail's specific input price proposals.

### *Bottom-up and top-down approaches*

7.18 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 sources and exercised a degree of judgement in forming our view on what should be achievable in CP4. Like other 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

- 7.19 We have carefully reviewed Network Rail's detailed proposals. In doing this, we have engaged with Network Rail and its consultants over the course of PR08. We also engaged Ernst & Young to support us in our assessment.
- 7.20 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 and robust 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.
- 7.21 We engaged Ernst & Young to support our assessment of Network Rail's efficiency proposals. 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.<sup>29</sup>
- 7.22 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.' Further 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 the same in the SBP as 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,

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<sup>29</sup> *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>

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 the 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, 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.

## International benchmarking

- 7.23 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.

7.24 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 operating conditions are most similar to Network Rail's, though North America can 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 domestic as well as international comparisons).

### **International maintenance and renewals benchmarking**

7.25 We have used statistical techniques to benchmark Network Rail's maintenance and renewals efficiency.<sup>30</sup> These produce a single performance measure that simultaneously takes account of variation in several cost drivers. Assessing unit cost measures alone cannot achieve this. We have conducted the international benchmarking in conjunction with Network Rail, the Institute for Transport Studies at Leeds University. Dr Michael Pollitt, of Cambridge University, has reviewed our analysis.<sup>31</sup>

7.26 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 methodology 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 with the assistance of the comparator companies. Again we benchmark maintenance and renewals expenditure, but this time for a time period of up to five years

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<sup>30</sup> 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.

<sup>31</sup> Our full report *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>.

(depending on the company); though for Network Rail, the data relates to a single year, 2006.

- 7.27 We are grateful to the UIC for providing us with access to their dataset, and to Network Rail for working constructively with us. 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. However, these outputs, while demonstrating the power of international benchmarking, are specific to the 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 to provide a useful tool for the wider rail industry. In the case of the sub-national level benchmarking, we hope to be able to include a greater number of companies in the peer group in future.
- 7.28 We consider that the econometric models we have developed are robust, both statistically and from an engineering perspective.<sup>32</sup>
- 7.29 However, 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 perspective the impact that omitted variables (e.g. asset quality and topography) might have on Network Rail's score. Based on this, we have no reason to believe that incorporating omitted variables would be favourable to Network Rail.
- 7.30 We have also 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 peer networks. Network Rail also commissioned its own work to explain the gap between it and its peers, and the reasons for this gap. The results of this work, discussed further below, confirm the results of our international benchmarking work.
- 7.31 Based on the econometrics and the other available evidence, we believe that the results of our international benchmarking reflect the scope for Network Rail to improve its maintenance and renewals cost efficiency versus the peer group.

#### *Benchmarking using the LICB dataset*

- 7.32 The LICB dataset includes data for Network Rail and 12 other European rail infrastructure managers (all of whom are publicly owned, with the exception of

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<sup>32</sup> 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.

Network Rail).<sup>33</sup> The UIC have 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		

- 7.33 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.
- 7.34 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.
- 7.35 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:

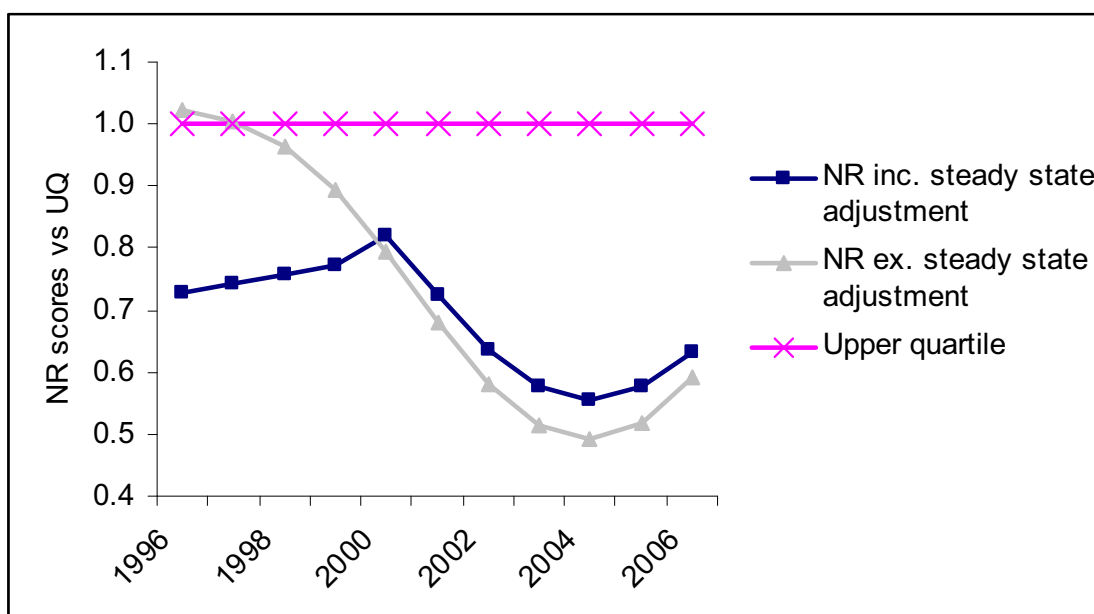
<sup>33</sup> The dataset covers Network Rail, OBB (Austria), Infrabel (Belgium), BDK (Denmark), RHK (Finland), DB (Germany), Irish Railways, RS (RFI) (Italy), ProRail (Netherlands), Jernbaneverket (Norway), Refer (Portugal), Banverket (Sweden) and SBB (Switzerland). Further information on the LICB dataset and UIC is available at [http://www.uic.asso.fr/uic/spip.php?page=imprimer&id\\_article=582](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](http://www.uic.asso.fr/reunion.php/20123/li06c_sum_en.pdf).

- 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.

- 7.36 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.<sup>34</sup> The single track and electrification variables provide an indication of the complexity of the track and the nature of the assets being maintained / renewed. 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.
- 7.37 Although we have also modelled maintenance and renewals costs separately, our preferred model benchmarks the 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.
- 7.38 Network Rail has asserted that at least part of the difference between its cost base and that of its peers 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 are not convinced that this is the case. However, to ensure that the benchmarking does not penalise Network Rail unfairly for this, we have made an adjustment to Network Rail renewals data that assumes their 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. Based on the data available and engineering judgement we have no reason to believe that this is not the case.

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<sup>34</sup> Our preferred approach is a flexible panel model, which both recognises the panel structure of the data (i.e. that the data follows 13 companies over time) and allows the pattern of efficiency to vary across firms and time.



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

7.39 Figure 7.1 shows the evolution of Network Rail’s efficiency score against the upper quartile 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 has declined markedly since 2000, 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.

7.40 The scores shown on the chart are against the upper quartile. Scores against the frontier are therefore slightly lower.

7.41 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, as at 2006. We compare Network Rail to the upper quartile rather than the frontier (i.e. best performing firm) in recognition of the fact that there is uncertainty as to whether the full gap to the frontier is due to inefficiency. 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 benchmarked Network Rail against the upper quartile rather than the frontier; and
- the peer group against which Network Rail is benchmarked does not necessarily reflect best practice. For instance, the peer group consists of public sector owned companies. Work conducted for us by NERA (and discussed further below) suggests that publicly owned enterprises generally are likely to be less efficient than those that are privatised.<sup>35</sup> Nonetheless, we expect that Network Rail's peers in Europe will improve their efficiency and there are examples (e.g. ProRail in the Netherlands, where the government has now made improvements in efficiency a condition of its public sector funding). Moreover, given Network Rail's aim of becoming a 'world class' company, its aim should arguably be to exceed the levels of efficiency implied by this peer group. Although not directly comparable in all aspects the North American Class 1 railroads, which appear to operate at far higher levels of efficiency than railways in Western Europe, provide Network Rail with an alternative benchmark against which to compare itself in terms of achieving 'world class' status.

*Benchmarking using the regional international dataset*

- 7.42 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.
- 7.43 In contrast to the LICB dataset, this dataset is new and emerging. The methodology 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.
- 7.44 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.<sup>36</sup>

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<sup>35</sup> Note that this study is not specific to the rail sector.

<sup>36</sup> There are 18 Network Rail areas.

7.45 The preliminary results highlight a significant gap in costs between Network Rail and 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.

## Understanding the efficiency gap

7.46 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 work has focused on detailed 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. The key areas of work relevant to this are:

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

## Lessons learnt from our international visits

7.47 During 2007 we undertook a range of visits to infrastructure managers in Europe, North America and Australia.<sup>37</sup> The specific aim of this visit programme was to gain information and better understand practices in other rail infrastructure managers to help us in our assessment of Network Rail’s SBP and the scope for efficiency improvement.

7.48 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 in other countries;
- use of innovative asset inspection methods;
- more use of risk based maintenance; and

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<sup>37</sup> *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>.

- quicker processes for taking and giving up track possessions than is currently achieved in Britain.

7.49 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.

## Alternative normalisation

7.50 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. The objective was to examine what would happen to Network Rail's CP4 cost base if it were required to match the 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 found that Network Rail's cost base would rise by between 20% and 40% depending upon which individual railway was used as comparator, whereas these comparators already operate at lower cost than Network Rail.<sup>38</sup> This work provides further confirmation of the existence of a significant efficiency gap between Network Rail and its peers in Europe, and it substantiates the broad conclusions reached by the econometric analysis.

## BSL analysis

7.51 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, additional, railways, including, Amtrak (the state owned US passenger company).<sup>39</sup> BSL's work had two distinct parts:

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<sup>38</sup> *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>

<sup>39</sup> *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).



- explanation of the efficiency gap, through identification of factors which make the British network more expensive to operate compared to the peer group; and
- suggestions of possible efficiencies which could result from adoption of European best practice.

### *Explanation of the efficiency gap*

7.52 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.

7.53 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 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 (including relating to the length of a possession site, the possessions regime and procurement).

### *Efficiency opportunities*

7.54 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);
- 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*

7.55 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 renewals costs between 1996 and 2005 for the LICB comparators 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;
- 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 spend to compensate for lack of renewals (the LICB figures show average maintenance spend remaining broadly constant over the period of study)];
  - a significant fall in maintenance spend 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);
  - a radical improvement in maintenance efficiency among the comparators (if so this is further identification of efficiency opportunities); and
  - a substantial reduction in network quality (which is not borne out by the delaying incident data which BSL uses in its system reliability adjustment).

7.56 We have conducted our own work using BSL’s data, but benchmarking to the *upper quartile* rather than the average of the peer group – which we consider to be a more appropriate benchmark. This gives higher efficiency gaps, greater than 50% for both renewals and maintenance. 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 efficiency gap of at least 20-25% for M&R.

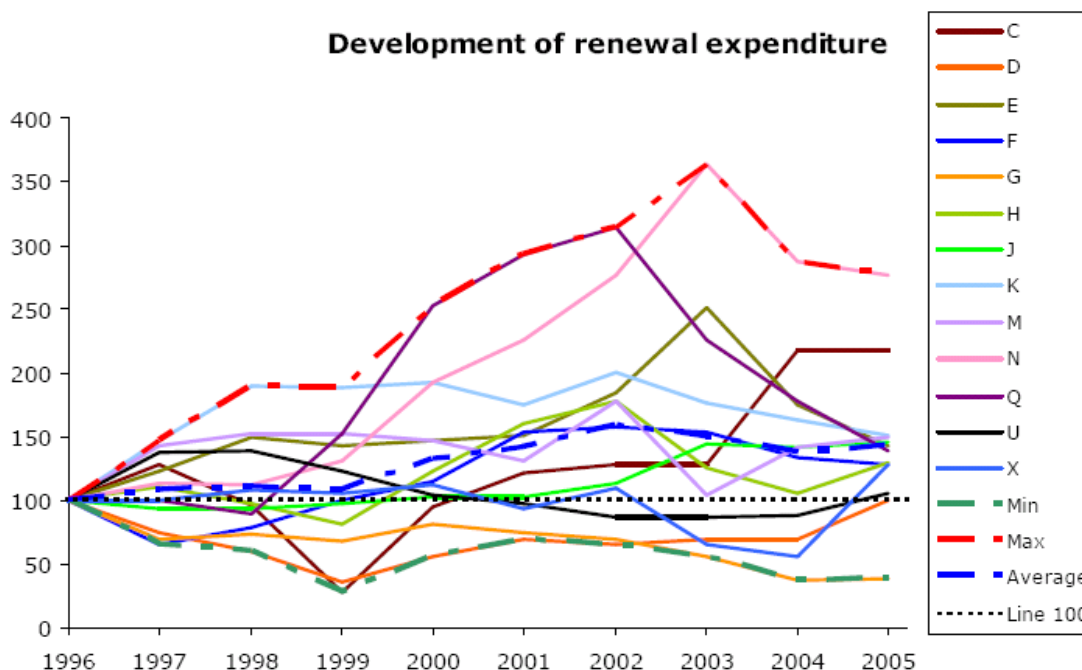


Figure 7.2: Indexed renewals cost for the LICB comparators (source: UIC<sup>40</sup>)

## RailKonsult – European best practice study

7.57 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<sup>41</sup>. The objective was to examine whether any 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

<sup>40</sup> 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](http://www.uic.asso.fr/reunion.php/20123/li06c_sum_en.pdf).

<sup>41</sup> *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>.

introduced in CP4. The study addressed safety issues and considered the speed at which implementation could take place.

7.58 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 one or two 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 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 save £6m per annum. Additionally ballast cleaning (partial renewal) as opposed to traxcavation (complete renewal) could comfortably 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 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.

7.59 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 efficiency. 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.

## Oxera study

- 7.60 In 2005 we engaged LEK Consulting and Oxera to undertake a preliminary assessment for us on the scope for efficiency improvement in CP4.<sup>42</sup> 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.
- 7.61 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.<sup>43</sup> As part of this work we also asked Oxera to consider the scope for improvements in the efficiency frontier (frontier-shift). Table 7.5 shows key results from Oxera's study.

<sup>42</sup> *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](http://www.rail-reg.gov.uk/upload/pdf/lek-ox_cp4effgns.pdf).

<sup>43</sup> *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>

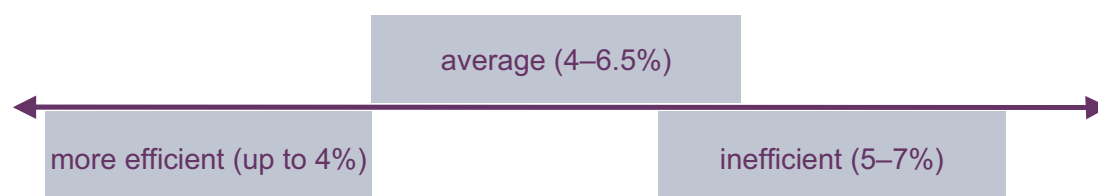
**Table 7.5: Results of Oxera study on the scope for CP4 efficiency improvement**

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

7.62 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.

7.63 Based on its analysis, Oxera advise 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)

## LECG study for Network Rail

- 7.64 Network Rail commissioned LECG to review LEK/Oxera's 2005 study as part of its April 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).
- 7.65 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.
- 7.66 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% pa (in a range of 1.6% pa to 5.7% pa). Oxera reviewed the LECG work as part of its study but did not change its results as a consequence of this.
- 7.67 As we were finalising this document Network Rail submitted to us a further report, a further review by LECG, of the new Oxera report (which we had shared with Network Rail). We have not yet had the time to consider fully this report, though we do not consider the criticisms that LECG makes of the Oxera report are justified and give us any reason to change the judgements we make on efficiency.

## Asset management benchmarking

- 7.68 In 2006-2007, the independent rail reporters AMCL undertook a 'best practice' benchmarking study of Network Rail's asset management.<sup>44</sup> 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.

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<sup>44</sup> *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>.

## International possessions benchmarking

- 7.69 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.<sup>45</sup> The study examined different approaches to possessions management, the amount of time used in 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.
- 7.70 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 Lloyds Register state that the high output trials in 2006 have 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.
- 7.71 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.

## EWS efficiency studies

- 7.72 This section deals with the efficiency studies sponsored by EWS. Both Network Rail and ourselves consider them to be useful contributions to this Review.<sup>46</sup>

### *US Class 1 Benchmarking*

- 7.73 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

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<sup>45</sup> *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>.

<sup>46</sup> 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>.



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
- 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.

### *Network Rail response*

7.74 Network Rail 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 the 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.

7.75 We have had further discussions with Network Rail. We have agreed to carry out more detailed benchmarking on specific comparable lines in Britain and North America.

### *Our view*

7.76 We recognise that there are significant differences between the GB and North American networks but consider that LEK and TTCI 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**

7.77 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.

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

#### *Network Rail response*

7.79 Network Rail has 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.

### *Our view*

7.80 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:** regardless of the exact contractual arrangements in the schedule 4 possessions regime, 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**

7.81 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 renewals spend; and

- all these savings could be realised within two years.

### *Network Rail response*

7.82 While broadly supportive of the work, several significant reservations were expressed by Network Rail. 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.

7.83 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.

7.84 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.

### *Our view*

7.85 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.

## Efficiency benefits of unsupported debt

7.86 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.<sup>47</sup> 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.

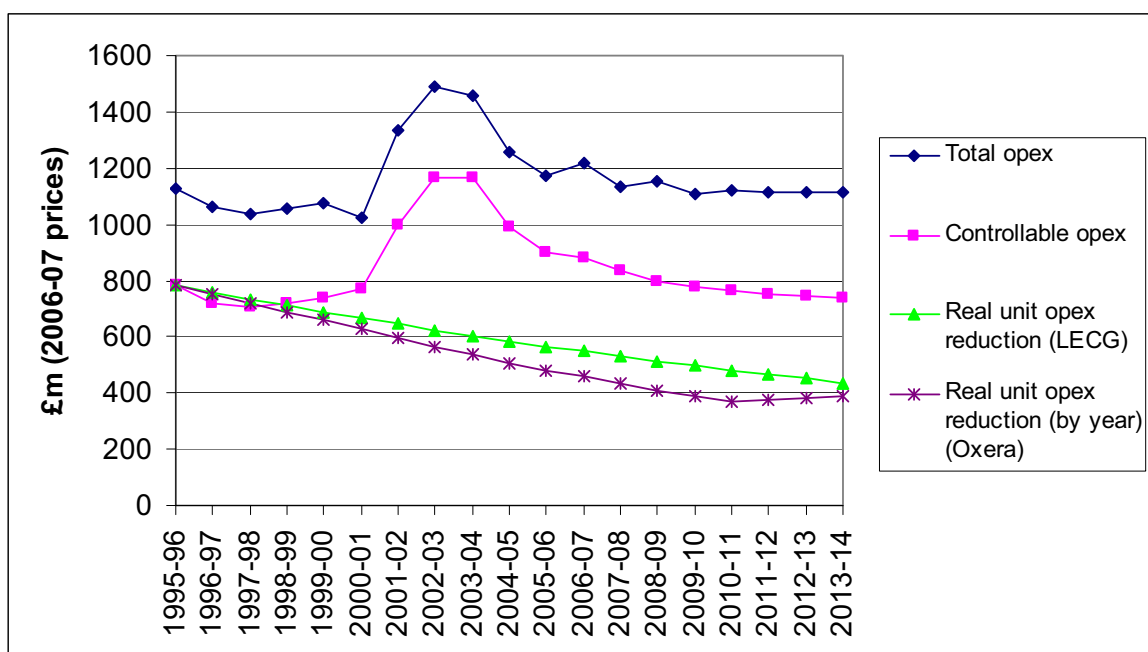
## Historical comparison of opex

7.87 We have examined Network Rail's performance in CP3. The company has made substantial 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 prices). Network Rail's net assumption for CP4 is opex savings of 1.5% pa. This is five times less than Network Rail achieved in CP3. Network Rail has not adequately explained to us why the rate of change reduces so much from CP3 to CP4.

7.88 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. We have used the central estimate of RUOE growth estimated by LECG of 3.2% pa, and from the Oxera study we have based the trendline on the annual improvements since the dates of privatisation for other sectors of around 4.% to 5% pa. The figure shows that at the end of CP4, the gap between Network Rail's controllable opex and the trend lines from other sectors lies in the range of 35-45%, even after Network Rail's proposed CP4 efficiency improvements. The analysis has not adjusted for additional obligations and output growth by Network Rail, although we would only expect this to account for a small proportion of the gap, since opex is not a cost that is assumed to vary materially with usage of the network.

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<sup>47</sup> *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>.



**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

7.89 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 are forecasting in the SBP to reduce operations costs to around £300m by the start of CP4.)

7.90 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 for CP3) 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 will discuss the findings before we publish it.

## Total employment costs

- 7.91 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 and bonuses, covering all of Network Rail's 34,500 employees.
- 7.92 Inbucon considered that whilst Network Rail's own benchmarking studies were not unreasonable, they did not cover all part 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 and will discuss the findings before we publish it.

## Insurance

- 7.93 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.
- 7.94 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 draft determinations.
- 7.95 Heath Lambert's findings are that Network Rail can make substantial savings in its insurance costs. These savings can be divided into three 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 £30m per annum;<sup>48</sup> and

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<sup>48</sup> Heath Lambert's initial estimate of the business interruption adjustment was £41m. Network Rail considered this was too high. We have used a cautious assumption of £30m for the draft determinations. Network Rail has recently sent us an analysis, which estimates these costs as £28m. We are reviewing this analysis and will conclude on it for our final determinations.

- 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.<sup>49</sup>

7.96 We have shared Heath Lambert's report with Network Rail and will discuss the findings before we publish it.

## **Drawing together the key evidence on the scope for efficiency improvement**

7.97 As this chapter has set out, there is a 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).

7.98 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 40% or more. We consider that the result of our econometric analysis of the LICB dataset, showing a gap of 37% for M&R, represents a robust, but conservative calculation. Whilst we have placed a high 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. The gap calculated using the LICB dataset is for 2006.

7.99 We have rebased the gap to the end of CP3 by subtracting the efficiency that Network Rail expects to achieve in 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).<sup>50</sup> For maintenance the resulting efficiency gap is reduced to 31% and for renewals it is reduced to 36%.

7.100 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

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<sup>49</sup> 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 public product liability. Therefore, it is difficult to determine how much public and public 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.

<sup>50</sup> 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.



6.2% per annum. Our analysis of historical controllable opex and Network Rail's projected expenditure for CP4, compared to the trends in efficiency improvement identified by Oxera (as well as the lower levels of efficiency identified by LECG in its study for Network Rail), highlights a gap at the end of CP4 of 35% to 45%. Our bottom-up assessment of insurance, total employment costs and the operations function confirm that Network Rail faces a significant efficiency gap at the end of CP3. We recognise the uncertainties in these studies and consider that a conservative estimate of the efficiency gap Network Rail faces is 35%.

- 7.101 We will review Network Rail's expected CP3 outturn efficiency again before we complete our final determinations and if there has been a material change in its efficiency performance compared to what we have assumed, we will update our rebasing of maintenance and renewals expenditure to the end of CP3.



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

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### Introduction

- 8.1 Building on the explanation of the work to assess efficiency in the preceding chapter, this chapter sets out our assumptions for the efficiency improvements we consider Network Rail can make CP4, and which we have factored into our calculations of access charges.
- 8.2 The chapter is structured as follows:
- the efficiency gap at the end of CP3 is summarised;
  - our treatment of input prices is set out; 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%.

### The treatment of input prices

- 8.4 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*

- 8.5 Network Rail submitted to us a detailed quantified assessment of the input price pressures it expects to face in CP4, undertaken by LEK Consulting.<sup>51</sup> 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.
- 8.6 Over CP3 the LEK report sets out that 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 -1% per annum to 3.3% 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.
- 8.7 RIA has also submitted to us information on expected about input price inflation in CP4. 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.<sup>52</sup>

### *Our view*

- 8.8 We recognise that 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

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<sup>51</sup> The input price study that Network Rail submitted to support its SBP may be accessed on Network Rail's website at <http://www.networkrail.co.uk/browse%20documents/StrategicBusinessPlan/Other%20supporting%20documents/LEK%20input%20price%20report.pdf>.

<sup>52</sup> RIA's letter may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/sbpcons-ria-270308.pdf>.

may be caused or exacerbated by input price inflation. These include the risk buffer and the re-opener provisions.

- 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 salary 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.<sup>53</sup> 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 will adjust 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 are not making any changes to the company's own projections on the basis of the submission made by RIA. Whilst RIA's submission has higher projections of input prices in CP4 than Network Rail has projected, the values are within Network Rail's range. RIA's submission is based on a survey of the supply industry. Survey evidence is useful but ultimately we consider the analytical approach undertaken by Network Rail to be a better basis for our assessment.

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<sup>53</sup> See paragraph 166 of appendix D of the Competition Commission report. This may be accessed at [http://www.competition-commission.org.uk/rep\\_pub/reports/2007/fulltext/532ad.pdf](http://www.competition-commission.org.uk/rep_pub/reports/2007/fulltext/532ad.pdf).

## Efficiency judgements for CP4 and the pace of change

- 8.17 In making our judgements on efficiency we have 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.
- 8.18 We recognise 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. (Our assessments of deliverability and safety, which we have taken into account in making our judgements, are set out in chapters 10 and 11.) Given these challenges, we have decided to profile further significant efficiency improvement (to catch-up the efficiency gap of 35% across OM&R) over ten years (in both CP4 and CP5). We recognise that many of the further cost savings that the company needs to make may be difficult to achieve and necessitate significant implementation of new technologies and working methods. Given the challenges Network Rail faces in CP4 it is right to give it sufficient time to do this and not to expect that the efficiency gap can be closed completely in CP4.
- 8.19 We have carefully considered whether ten years is an appropriate time period and what the profile of efficiency improvement over this horizon should be. 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 have taken 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. Nonetheless, for a company that aspires to be world class, we consider that a balance of two-thirds improvement in CP4 and one-third in CP5 is appropriate.
- 8.20 Table 8.1 sets out our recommended CP4 efficiency improvement in the context of catching-up the gap over ten years. It assumes that Network Rail should be able to catch-up two-thirds of the efficiency gap in CP4. In order to determine the overall level of efficiency improvement in CP4 we are also taking into account expected frontier-shift and input price inflation above that reflected in RPI.

**Table 8.1: Possible scope for CP4 efficiency improvement over ten-years – recommended option**

	Maintenance	Renewals	M&R (weighted)	Opex	OM&R (weighted)
<b>Efficiency gap</b>					
End CP3 efficiency gap	31%	36%	35%	35%	35%
<b>CP4 efficiency</b>					
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%)
<b>Total efficiency in CP4</b>	<b>17%</b>	<b>24%</b>	<b>22%</b>	<b>17%</b>	<b>21%</b>
<i>Network Rail's SBP</i>	~12%	~15%	~14%	~7%	~13%
<b>CP5 efficiency</b>					
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%

8.21 It is important to note that the efficiency improvements for CP5 are indicative. They are based on our current view. We would expect to review the scope for efficiency improvement in CP5 (including the catch-up factor, frontier-shift and input prices) as part of the 2013 periodic review.

*Annual profiles*

8.22 The annual profiles for the overall CP4 efficiencies based on table 8.1 are set out in table 8.2. The controllable opex profile (3.5% pa) is lower than M&R (5% pa), which reflects the lower level of frontier-shift and higher input price adjustment.

8.23 In applying the efficiencies for CP4 we intend to use the same (weighted) value for maintenance and renewals. Network Rail has the ability to switch between maintenance and renewals to deliver outputs (at least in the short-term).

**Table 8.2: Annual profile for recommended efficiencies**

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

### Can these efficiencies be achieved in CP4?

8.24 In making these judgements we have very carefully considered all the available evidence and we have paid particular regard to the 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 has achieved efficiency improvement of nearly 31% during CP4 (on average this is around 7% 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;
- 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 study has 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 able to be delivered in GB within five years;
- the work by AMCL on asset management highlights further opportunities for improvements in asset management;
- 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;
- 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); and
- the efficiency benefit sharing mechanism that is being introduced should strengthen the incentives to achieve and outperform our determination.



## 9. Enhancement expenditure

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### 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 It must include those schemes in its CP4 delivery plan. Any changes it makes between now and the delivery plan must be consistent with our determinations and, where appropriate, be consistent with decisions DfT takes on its rolling stock procurement and cascade plans. Once the delivery plan is established, any changes to the plan will be subject to a regulated change control process.
- 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 determinations on funding and the outputs to be delivered.

### Network Rail's enhancement proposals

- 9.4 Network Rail's SBP update proposes £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.
- 9.5 Of this, some £9.0bn is within scope for this review, consisting of:

- £8.6bn of expenditure 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 7 day railway); and
- £448m of expenditure in Scotland including Transport Scotland HLOS specified projects (Airdrie to Bathgate and Glasgow Airport Rail Link) and development funding for future projects.

9.6 The remaining £2.1bn consists of Transport Innovation Fund schemes (around £120m in CP4), third party funded schemes (around £800m) 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
<b>CP4 total</b>	<b>11,150</b>	

9.7 Network Rail set out its plans in its SBP, but we had some concerns which we included in our February 2008 assessment:

- a lack of supporting evidence for some of the schemes proposed;
- the need for further work on the most efficient way to deliver the capacity requirements of the England & Wales HLOS; and
- the need for development of the programme, and projects within it, to proceed more quickly. Many schemes did not appear to be progressing through the GRIP process; of the 47 schemes common to both the ISBP

and SBP only a quarter had progressed by one or more GRIP stages and a third had regressed.

- 9.8 Network Rail provided a substantially revised response in its April 2008 update. This differed from the SBP in that:
- the costs of nearly every scheme had changed;
  - 30 schemes had progressed further through the GRIP stages and only three schemes had regressed;
  - it included additional schemes to meet the England & Wales capacity specification particularly on route 10 (Leeds) and route 20 (Manchester);
  - it included small-scale capacity schemes, some of which were previously included as Network Rail discretionary fund (NRDF) schemes; and
  - it proposed a revised approach (and reduced costs) for meeting the England & Wales HLOS performance specification.

## **Our approach to the assessment of enhancements**

- 9.9 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.
- 9.10 In the case of 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.
- 9.11 In the case of the Scotland HLOS this assessment covered the Airdrie-Bathgate and GARL projects and delivery of the 92% PPM target (for which no additional projects were found to be needed – see annex C).
- 9.12 Network Rail stated that no further enhancement projects are needed to deliver the (Great Britain) safety specification. We agree with this assessment.
- 9.13 Network Rail also proposed in its SBP update other enhancements and incremental expenditure beyond what is required to deliver the specific outputs and individually defined projects in the two HLOSs. We have 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.

- 9.14 The remainder of this chapter considers these assessments in more detail, beginning with an overview of how efficient costs are determined, including a consideration of what is meant by efficiency, and an analysis of the treatment of risk.

## Core issues on scheme costs: efficiency and risk

### *Efficiency*

- 9.15 Network Rail has built up its cost proposals based on bills of quantities and the unit rates from recently competitively tendered projects to provide an estimate of the current level of efficient costs.
- 9.16 Our review of efficient project costs has been informed by three consultancy studies: Arup has provided engineering advice including advice on scheme costs, SDG has provided strategic advice and Halcrow (the independent reporter) has provided advice on West Coast schemes. We have also considered work done by our consultants on efficiency. Efficient costs have, where possible, been estimated on a bottom-up basis by examining: project scope, project costs, future efficient costs, further efficiency due to frontier shift and input price inflation.
- 9.17 **Project scope.** We have reviewed the scope for each project to identify whether it is likely to achieve what it sets out to do, whether it is needed in order to deliver either HLOS and whether there are overlaps or interdependencies between schemes.
- 9.18 **Project costs.** We have 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.
- 9.19 **Future efficient costs.** In chapter 8 we set out a future efficiency trajectory for maintenance, renewals and operating expenditure. Our assessment of future efficient enhancement expenditure takes two factors 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.
- 9.20 We have drawn 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, 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 (including asset creation and acquisition) carried out by AMCL (independent reporters).

- 9.21 We considered whether to apply the full future efficiency factor we have determined for renewal expenditure to comparable parts of the SBP enhancement expenditure. This would have implied average efficiency savings of around 14% over the course of CP4. However, we recognise that the comparison is not exact and we have therefore taken a prudent view that leads to somewhat lower reductions in costs.
- 9.22 For platform extension works we believe that an average cost reduction of 12.5% is achievable, taking into account the large scale of the programme and the significant scope for modularisation. We consider that such efficiency savings are readily achievable, with RailKonsult estimating a 25% saving in platform costs from modularisation.
- 9.23 For power supply works we believe that an average cost reduction of 7.5% is achievable. This takes into account the lower potential for modularisation for this work.
- 9.24 The 5% efficiency saving we have assumed for other, non-specified, schemes reflects opportunities for improved procurement, work and possessions planning and project management. The evidence indicates that such efficiencies are readily achievable and that there is scope for Network Rail to outperform our assumptions.
- 9.25 **Frontier shift** is future efficiency gain due to productivity improvements over time (e.g. due to technological developments). We consider that any potential for frontier shift would be in addition to the efficiency savings identified above. We commissioned consultants Oxera to estimate Network Rail's scope for frontier shift efficiency gain in enhancements. Oxera estimated that Network Rail could improve the efficiency of enhancement expenditure by between 0.3% to 1.1% per annum. We have assumed a frontier shift efficiency gain of 0.7% per annum. Frontier shift efficiency has been applied to forecast expenditure in each year. Frontier shift efficiency has not been applied to 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 frontier shift efficiency is unlikely (for example King's Cross).
- 9.26 **Input price inflation.** Network Rail has 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 have retained Network Rail's allowance in our calculations.

## Treatment of risk

- 9.27 As described in chapter 13 we propose that Network Rail has protection from financial risk in the form of a risk buffer of around £1bn over CP4, and, if necessary, deferral of 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.
- 9.28 We must therefore decide how to treat financial risks related to enhancement works. In essence, the possible approaches vary according to how much certainty can be attached to outturn costs. This is often expressed as a probability: a 'PX' estimate means that there is believed to be an X% likelihood, or probability, that the true cost will be no more than the estimate.
- 9.29 Network Rail has proposed that projects are costed at P80. Over the whole CP4 programme Network Rail estimates 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.
- 9.30 For specified projects the maximum cost caps identified in the HLOS already reflect P80 estimates and we believe that it is appropriate to retain this approach to give a high degree of certainty on the project costings.
- 9.31 Other schemes are generally at an early stage of development and Network Rail has identified a portfolio P80 risk adjustment based on assumed cost distribution and project independencies. For these projects the difference between the point estimate and the mean is 15% with a further 5% adjustment to the P80.
- 9.32 We have 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 risk allowance of 20% which a P80 estimate represents is consistent with our investment framework. For projects at GRIP stage 5 this allows for a 10 to 15% (and 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.
- 9.33 As described in chapter 13 we propose an approach to enhancement overspend where a proportion of any aggregate overspend is logged up for inclusion in the RAB, subject to Network Rail absorbing the first part of overspend in each year and providing evidence that it is not manifestly



inefficient. It is therefore important that Network Rail has a sufficient expenditure allowance to undertake the proposed enhancement portfolio.

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

## Enhancements required by the England & Wales HLOS

9.35 The England & Wales HLOS explicitly requires delivery of:

- baseline (committed) schemes;
- specified projects/programmes with capped CP4 expenditure (Thameslink; Birmingham New Street 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 output specification (and the general 'levelling up' requirement);<sup>54</sup> and
- the safety specification (for which no schemes are required).

9.36 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.

### *Baseline schemes*

9.37 Baseline (committed) schemes comprise the Access for All programme, King's Cross redevelopment and the remaining elements of the West Coast Route Modernisation (WCRM).

9.38 **Access for All** is a 10-year programme to deliver station accessibility enhancements. The programme was launched in March 2006 and there is a well-established framework for individual scheme identification, prioritisation and delivery. We accept Network Rail's proposed allowance of £206m in CP4. The programme has interdependencies with the national station improvement programme (NSIP), structures renewals (as this is often the best time for access for all improvements to be planned and delivered) and individual station enhancement proposals. We do not approve funding for individual projects, but ensure efficiency through an annual review of project costs.

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<sup>54</sup> The England & Wales HLOS states that the Secretary of State "attaches importance to narrowing the gap between the poorest performing services and the rest".

**Table 9.2: England & Wales enhancement projects in CP4**

£m (2006-07 prices)	SBP update
<b>Baseline projects</b>	
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
<b>Total England &amp; Wales baseline projects</b>	<b>1,251</b>
<b>Specified projects</b>	
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
<b>Total HLOS specified</b>	<b>4,141</b>
<b>HLOS Capacity schemes</b>	<b>1,685</b>
<b>HLOS performance fund</b>	<b>250</b>
<b>Total to meet explicit HLOS requirements</b>	<b>7,328</b>
<b>Optional enhancement projects</b>	<b>1,253</b>
<b>Total England &amp; Wales enhancements</b>	<b>8,581</b>

9.39 The **King's Cross** redevelopment programme is a mixture of enhancement and renewal works including a new western station concourse and train shed improvements. The scheme is well advanced (at GRIP stage 6 – construction, test and commission) with enhancement works starting in CP3. Completion is

ties to timetable changes in December 2011 and the London Olympics. There are interdependencies with the Thameslink programme. We have reviewed Network Rail's costs and consider them to be reasonable, so we accept Network Rail's estimated costs of £175m. These costs already reflect Network Rail's own efficiency plan; we will continue to scrutinise Network Rail's efficiency as it implements the project. The key project risks are associated with integration of the scheme with third party and local requirements.

- 9.40 **WCRM** schemes comprise Stafford/Colwich remodelling, power supply upgrade and Bletchley/Milton Keynes remodelling. The first two schemes are expected to continue into CP5. For Stafford/Colwich we have reservations over Network Rail's funding requirement for CP4. The project is just entering the consultation phase of the Transport and Works Act process. Network Rail's estimated expenditure in CP4 envisages much greater progress in the first three years than we consider to be realistic. As a result of this and our efficiency assumptions we have reduced the CP4 cost allowance to £364m from Network Rail's estimate of £483m. Until such time as the TWA process is concluded the scope of the project will remain uncertain.
- 9.41 The power supply upgrade is to strengthen the system to support future increases in demand from electrically hauled passenger and freight trains. Part of the upgrade work is to deliver an auto-transformer system from North Wembley to Carstairs. This work is under way and is needed to support the December 2008 timetable improvements. The second phase is due for completion for the 2009 timetable. Given that some of this work is directly linked to the requirements of the December 2008 timetable and should therefore have been completed in CP3 under existing funding, we have reduced the CP4 provision to £235m (from £272m).
- 9.42 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.

#### *Specified schemes*

- 9.43 These are the Thameslink programme, Birmingham New Street station, Reading station, the national station improvement programme (NSIP), the Network Rail discretionary fund (NRDF), the strategic freight network (SFN) and the intercity express programme (IEP).
- 9.44 **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 has confirmed to us that it considers Network Rail’s cost estimate of £2.70bn in CP4 to be efficient. Thameslink is needed to deliver the HLOS London capacity specification and has interdependencies with other London capacity projects.

- 9.45 **Birmingham New Street.** This scheme is to provide increased capacity for passenger movements and includes footbridge, platform and station 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 in the scheme; 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.
- 9.46 Much of the scheme relates to building rather than railway engineering works. The main risk to Network Rail relates to the allocation of risk between parties. We understand that implementation risks are shared between Network Rail (60%) and Birmingham City Council (40%). While costs are calculated at P80 there is still a modest risk that costs will overrun, with Network Rail potentially picking up a large proportion of these costs. We consider Network Rail’s estimate of £128m is reasonable, at slightly below the £133m HLOS cap.
- 9.47 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 at Reading costing up to £425m in CP4 (£441m in 2006/07 prices). Network Rail has included an allowance of £456m in CP4 in its April update, £15m more than specified in the HLOS. The total scheme cost is £525m spread over CP3, CP4 and CP5. These figures include a P80 risk allowance and input price inflation. In line with the requirements of the HLOS we are including an expenditure allowance of £441m for CP4.
- 9.48 This project is linked to the Reading southern platform extensions which are proposed by Network Rail to help deliver the capacity metric (and work should be undertaken at the same time). There are risks to the delivery of the project related to Transport and Works Act processes, which can take a significant time to complete. We consider that the current proposed timescale is achievable, and with local stakeholder support it should be possible to complete the project in the early part of CP5.
- 9.49 **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.
- 9.50 The project is linked to maintenance and renewals expenditure, franchise commitments, access for all, planned work on station infrastructure (including platform lengthening) consequent on the HLOS and third party investments. With the NSIP programme board we have agreed a structure for

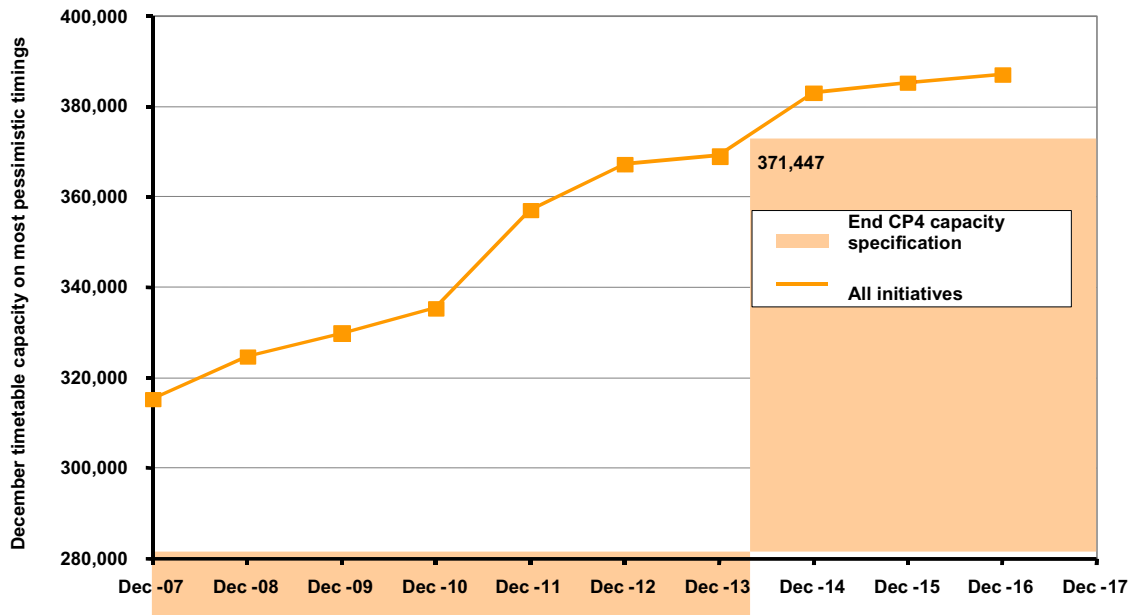
demonstrating efficiency composed of: a cap on overhead costs including management costs, approvals and contingency allowance; upper limits and benchmark unit cost rates. We have also agreed high level risk and project controls. In particular these include dispute resolution procedures, procurement and contracting requirements and the means of selecting the best placed party to deliver each individual scheme, including a challenge process. We have retained Network Rail's proposed cost allowance of £156m.

- 9.51 **Strategic freight network (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. The HLOS allocated a maximum of £200m towards the development of the SFN in the last four years of CP4 (£208m in 2006/07 prices). Network Rail, following discussions with freight operators, made proposals for the SFN in the SBP update. These encompass Ipswich to Nuneaton capacity enhancement, diversionary routes (from Southampton via Laverstock/Andover and from the Channel Tunnel route to the south of London) and separate ring fenced funds for train lengthening and in-fill gauge enhancement schemes. We require Network Rail to work up more detailed plans for the allocation of funds in the CP4 delivery plan, working closely with the industry, and taking account of interdependencies with freight projects funded from other sources. We have set the maximum CP4 spend at £208m.
- 9.52 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). NRDF has been operating for three years and after a slow start the fund appears to be working better. We have retained Network Rail's proposed allowance of £234m for CP4.
- 9.53 The **Intercity Express Programme (IEP)** is a set of infrastructure works to enable operation of a new generation of inter-city express trains. Works are focused on two routes: the East Coast main line (where IEP services are due to start testing in 2012) and Great Western main line (with services starting in 2016). Network Rail has included a figure of £260m in the SBP update largely made up of platform lengthening, power supply and clearance works. It is acknowledged that these costs are at a very early stage of development and will need to be refined as the requirements of IEP become clearer. Given this uncertainty we have retained Network Rail's proposed allowance.

#### *Capacity schemes*

- 9.54 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).

- 9.55 Network Rail has included £1.7bn of schemes in the SBP update to meet these requirements. Many of the schemes are at early GRIP stages and costs and project scopes are subject to considerable further development.
- 9.56 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.
- 9.57 **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, which is shown in figure 9.1.



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

- 9.58 Our assessment of the SBP indicates that not all the proposed schemes are necessary to deliver the **HLOS London capacity** specification. We removed those which did not appear to be needed, and considered them later against the criteria described in paragraph 9.70.
- 9.59 The schemes required for London have a strong interdependence with the Thameslink works. These involve operation of longer trains over a number of routes and therefore include platform lengthening schemes 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 therefore excluded the costs of these schemes here to avoid double counting them.

- 9.60 While relatively expensive solely in terms of delivery of peak capacity into London we are satisfied that the schemes proposed for the East Coast main line are also required to deliver the route (passenger-km) capacity specification.
- 9.61 We have undertaken a detailed review of the efficiency of the HLOS capacity schemes. This has involved a review of unit rates and scope, removal of overlaps with the Thameslink programme and the application of an efficiency trajectory.
- 9.62 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.
- 9.63 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.
- 9.64 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 overdelivery;
  - 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.
- 9.65 The SBP update provides additional capacity, notably in Leeds and Manchester, so this overdelivery grew bigger. We have reviewed the schemes in the SBP update and have 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 none of the proposed schemes was found to be needed, although we considered them again later against the criteria. In the case of Leeds we have reduced Network Rail's cost allowance for route 10 from £94m to £60m and for Manchester we have reduced Network Rail's

cost 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.

- 9.66 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 will also be 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).

#### *Performance schemes*

- 9.67 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.
- 9.68 As explained in the annex, we believe 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.
- 9.69 We have concluded that the funding to deliver the performance improvements should be £160m.

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

- 9.70 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.



- 9.71 Annex D includes full details of the schemes we assessed, and the funding provision which we have made for those which we believe are required (these differ from Network Rail's estimates in many cases). Annex D also lists schemes which did not meet our criteria and for which we have not made funding provision.
- 9.72 The projects described in paragraphs 9.73 to 9.90 meet our criteria. We have grouped them into categories which highlight why they are necessary and justified.

*Schemes which provide journey time improvements*

- 9.73 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*

- 9.74 **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 proposes 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.
- 9.75 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.
- 9.76 **Seven day railway:** The core 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.

- 9.77 Network Rail has 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.
- 9.78 We believe the one-off costs are 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.
- 9.79 Network Rail claims 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.
- 9.80 We believe that part of the passenger and freight revenue benefits should be attributed to improvements already funded in the core plan, and that these figures are overstated. We consider 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.
- 9.81 On the basis of our assessment of likely costs and benefits we believe the evidence shows a good financial case for the seven day railway on suitable parts of the network.
- 9.82 Work on detailed plans for most individual routes is at an early stage, so we are 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 are therefore including funding for £160m of capital expenditure and £60m of additional maintenance and renewal costs in CP4.
- 9.83 We will require 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. As part of our consultation on a CP4 trajectory for network availability (see chapter 4) we will be proposing a separate defined increment which must be delivered through seven day railway schemes.
- 9.84 **Redditch branch enhancement:** increasing capacity to allow more frequent services to Redditch.

- 9.85 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.*

- 9.86 **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 estimate that the cost of providing coverage on these lines is £32m but identified potential £7m savings by reducing coverage to NRN levels. We consider that this additional work should be funded but our analysis indicates that further reductions are possible and that the funding required can 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.
- 9.87 **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 consider this to be reasonable and have 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.
- 9.88 **Station security:** Network Rail has proposed expenditure of £18m on projects to prevent vehicle incursions at stations, with the support of Government. We have made a full allowance for this.
- 9.89 **North London Line:** a proposed £28m contribution to funding the major TfL East London Line extension project by advancing certain renewals work 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. We consider the £28m contribution to be reasonable.
- 9.90 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 have 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.

## Enhancements in Scotland

### *Scotland HLOS*

9.91 The Scotland HLOS sets out requirements in three tiers:

9.92 **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.

9.93 **Tier 2** sets out major project requirements as follows:

- Airdrie to Bathgate;
- Glasgow Airport Rail Link (GARL), and
- Borders Railway.

9.94 **Tier 3** sets out projects to be developed.

### *Network Rail's response*

9.95 Network Rail's SBP sets out £448m of enhancement expenditure in Scotland.

**Table 9.3: Network Rail's enhancement proposals in Scotland**

£m (2006-07 prices)	SBP update
Airdrie - Bathgate	185
Glasgow Airport Rail Link	173
Borders Rail	3
Glasgow to Kilmarnock	12
Tier 3 project development	13
Small projects fund	20
<b>Total core projects</b>	<b>406</b>
Seven day railway (Scotland)	30
Policy choices	12
<b>Total optional projects</b>	<b>42</b>
<b>Total</b>	<b>448</b>

*Our assessment of enhancement requirements and costs*

- 9.96 This section sets out our view of the costs of the HLOS and optional projects in Scotland.
- 9.97 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.
- 9.98 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
- 9.99 **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.
- 9.100 We have undertaken a review of Network Rail's cost estimates and consider that they could be over-estimated by 15% or £26m. Further, consistent with other projects, we do not consider that Network Rail's cost allowance should include optimism bias. We have 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.
- 9.101 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 consider that this is reasonable.

- 9.102 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 have therefore included £12m in our calculations.
- 9.103 Network Rail has included a £20m **small projects fund** as specified in the HLOS. We have included £20m at 2006-07 prices in our determination.
- 9.104 Network Rail included £13m to **progress Tier 3 projects** to GRIP stage 1. This cost appears reasonable and we have therefore included it in our determination, as £13m at 2006-07 prices.
- 9.105 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 propose not to include a cost allowance for this in CP4.
- 9.106 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 have included £3m for GSM-R and nothing for SISS.

## Summary

- 9.107 Table 9.4 summarises the funding provision we have included in this determination, and compares it with the proposals in the SBP update.

**Table 9.4: Funding provided for CP4 enhancements**

£m (2006-07 prices)	SBP update	Determination
<b>England &amp; Wales</b>		
England & Wales HLOS	7,328	6,561
Other England & Wales projects	1,253	571
<b>Sub-total England &amp; Wales</b>	<b>8,581</b>	<b>7,132</b>
<b>Scotland</b>		
Scotland HLOS	406	372
Other Scotland projects	42	3
<b>Sub-total Scotland</b>	<b>448</b>	<b>375</b>
<b>CP4 total</b>	<b>9,029</b>	<b>7,507</b>

## 10. Network Rail's ability to deliver the CP4 capital programme

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### Introduction

- 10.1 We need to be satisfied that the obligations which this determination places on Network Rail are likely to be deliverable. This chapter considers 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 we are assuming that Network Rail will need to carry out £10.5bn of renewals expenditure and £7.5bn of enhancement expenditure, compared to CP3 levels of £3.5bn for enhancement expenditure and £14.2bn for renewals (with CP3 levels being at a lower level of efficiency).
- 10.2 Our assessment focuses on Network Rail's ability to deliver against its own obligations. But 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.

### Factors affecting capability

- 10.4 We 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

- 10.5 Network Rail has 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 has provided an assessment of its capability along the 'value chain' (ranging from design to installation).
- 10.6 The company has 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 believes that its delivery plans are robust.
- 10.7 Network Rail's plans have 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 intends to make more use of wiring trains to increase productivity and to manage the critical resources more closely.
- 10.8 The signalling programme is also an area where the supply base needs careful management. Network Rail has said that the uneven profile of work causes some risks, but that it believes the planned volumes to be deliverable by careful scheduling.

## Organisation and process capability

- 10.9 Again, the company has 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.
- 10.10 The company has 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.
- 10.11 In some areas, such as implementation of the seven day railway concept, Network Rail will have to make substantial changes to the way it works. It has shown 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 will be needed.

## Wider influences

- 10.12 Network Rail has analysed the competition for resources from other large construction projects which are planned, many of which are 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.



10.13 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.

## Our assessment

10.14 Overall we have been encouraged by the significant advances Network Rail has 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.

10.15 We commissioned Nichols to undertake this work<sup>55</sup>. Nichols point out that assessing capability requires a clear understanding of what needs to be delivered. In that respect, because around half of the enhancement programme (by value) is still at an early stage of development, the actual requirements are not well defined. Nichols made ten recommendations, and we asked Network Rail to respond to these.

10.16 The three recommendations which Nichols categorises as fully within Network Rail's control cover developing:

- an overall capability development program;
- high-level resources master plans; and
- a more effective capability maturity model.

10.17 Network Rail has 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 welcome this. Network Rail believes that it already has an appropriate resources master plan and makes appropriate use of the capability maturity model.

10.18 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.

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<sup>55</sup> *Rapid review of Network Rail's capability to deliver its increased programme of enhancements*. The Nichols Group, April 2008. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/pr08-nicholscap-220408.pdf>.

- 10.19 Network Rail has already considered its planned delivery and believes its plans are appropriate. We recognise that specific outputs and milestones will not be firmed up until the CP4 delivery plan is published.
- 10.20 Network Rail already has a number of initiatives in place for skills development and cross industry collaboration. It has begun work on plans for project monitoring in CP4 but recognises that this is at an early stage.
- 10.21 There are three Nichols recommendations that Nichols says are 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.
- 10.22 We set out our proposals for change control in chapter 4, and Network Rail is broadly in agreement with this. We are working closely with funders and will continue to do so.
- 10.23 Timely project development is essential to the success of the programme. We have discussed this further with Network Rail, who will provide revised plans with milestones for reaching GRIP stages so that we can monitor progress during the remainder of CP3 – this will also bring a strong focus on the issue of obtaining planning permission.

## Conclusions

- 10.24 We welcome the progress that Network Rail has made in developing its understanding of the delivery challenge and of its ability to meet it.
- 10.25 We have concluded that, while the scale of the capital programme we intend to fund through this determination represents 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.
- 10.26 For certain planned works within the West Coast Route Modernisation programme we have reduced the proposed CP4 funding because the evidence suggests that these specific projects cannot be progressed as quickly as the SBP assumes. We have also made a small reduction in the volume of signalling renewals we propose should be funded, as discussed in chapter 5.
- 10.27 Chapter 31 explains how we will develop our approach to 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.

# 11. Safety management

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## Introduction

11.1 This chapter explains the work we have undertaken in making our determinations 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(3) of the Railways Act 1993 to take into account the need to protect all persons from dangers arising from the operation of railways in carrying out our functions.

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 determinations 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;
- 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; and
- delivery of improvements in capacity and performance during CP4 depended on the success of some major change initiatives, and if these initiatives could not be effectively implemented then this will put pressure on the effective delivery of the outputs in CP4. It was unclear to us how Network Rail would ensure that safety continued to be maintained in the event that a new work process or technology failed to deliver the expected performance and capacity benefits.

## **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 experts 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, 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 over CP4.

11.10 Network Rail will undertake a number of major, and in some cases novel, 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 particularly active in this area and will need to continue in order to achieve the frontline performance and plans;
- 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 the company's arrangements to implement risk control and change management in those areas where we have residual safety concerns. Through this inspection 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 efficiencies.

### **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. 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.



## 12. Overall efficient expenditure

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### 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 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 Network Rail's 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, given that some of the risks that Network Rail covers through business interruption insurance, e.g. schedule 8 compensation payments, are taken account of elsewhere in the determination, we have applied our controllable opex efficiency assumptions discussed in chapter 7 to controllable opex after deducting from controllable opex £30m per annum for business interruption;
- 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; and
- the enhancements expenditure assumptions are as described in chapter 9.

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 judgements**

£m (2006-07 prices)	Controllable opex	Non-controllable opex	Maintenance	Renewals	Enhancements	Total
<b>England &amp; Wales</b>						
Network Rail's SBP/SBP update	3,429	1,649	4,407	10,260	8,579	28,325
Our determination	3,081	1,631	4,133	9,252	7,132	25,229
<b>Scotland</b>						
Network Rail's SBP/SBP update	348	147	483	1,397	448	2,823
Our determination	311	146	451	1,252	375	2,534
<b>Great Britain</b>						
Network Rail's SBP/SBP update	3,777	1,796	4,889	11,657	9,029	31,148
Our determination	3,392	1,776	4,584	10,504	7,507	27,763

**Table 12.2: Annual judgements of CP4 expenditure – England & Wales**

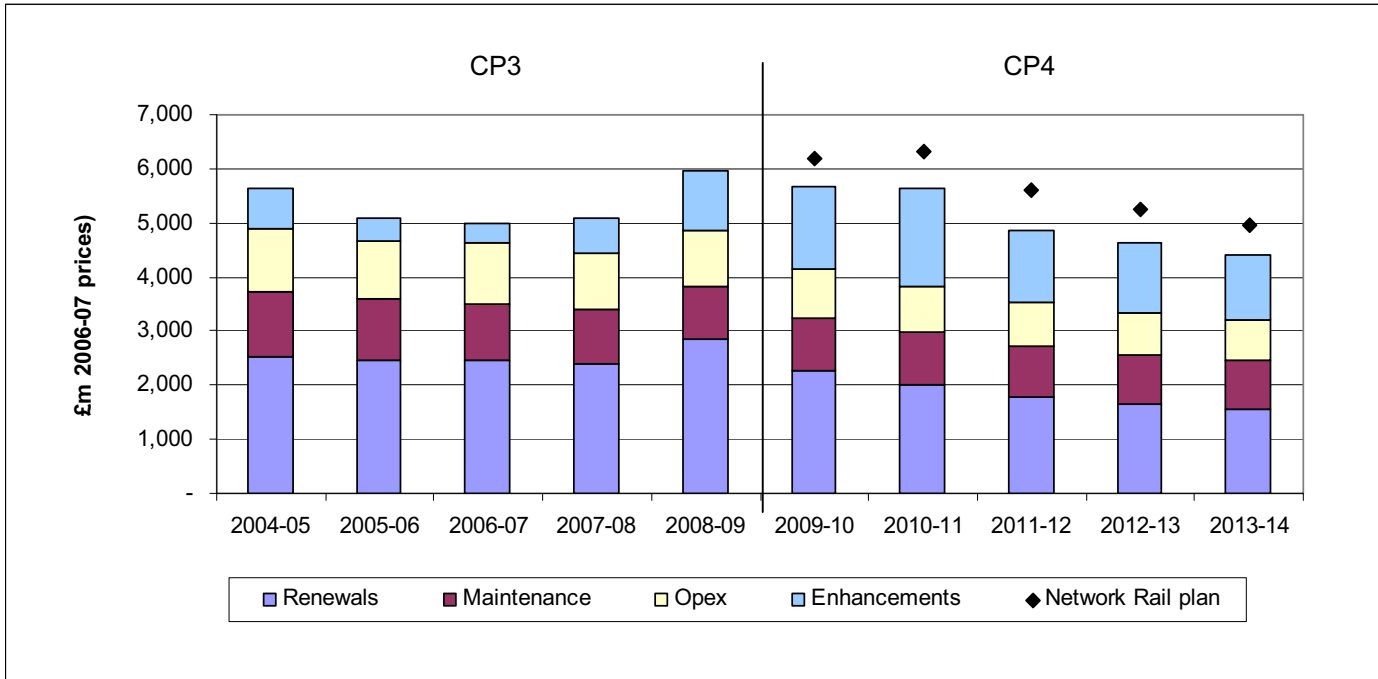
£m (2006-07 prices)	2009-10	2010-11	2011-12	2012-13	2013-14	Total
Maintenance	922	867	820	782	743	4,133
Controllable opex	661	638	615	594	573	3,081
Non-controllable opex	302	319	330	337	341	1,631
Renewals	2,264	2,012	1,775	1,641	1,560	9,252
Enhancements	1,519	1,801	1,325	1,291	1,196	7,132
<b>Total</b>	<b>5,668</b>	<b>5,637</b>	<b>4,866</b>	<b>4,645</b>	<b>4,413</b>	<b>25,229</b>

**Table 12.3: Annual judgements of CP4 expenditure – Scotland**

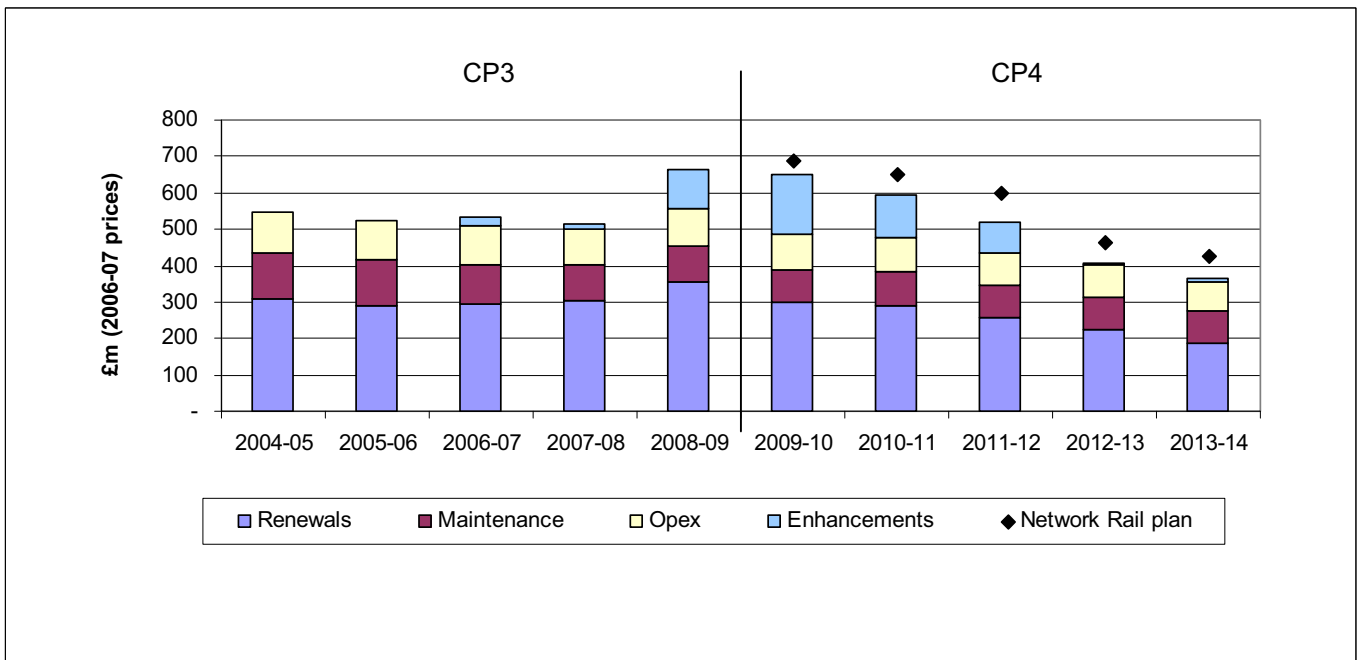
£m (2006-07 prices)	2009-10	2010-11	2011-12	2012-13	2013-14	Total
Maintenance	99	94	90	86	82	451
Controllable opex	67	64	62	60	58	311
Non-controllable opex	26	30	30	31	31	146
Renewals	297	290	256	223	186	1,252
Enhancements	160	116	83	8	7	375
<b>Total</b>	<b>648</b>	<b>594</b>	<b>520</b>	<b>408</b>	<b>364</b>	<b>2,534</b>

**Table 13.4: Annual judgements of CP4 expenditure – Great Britain**

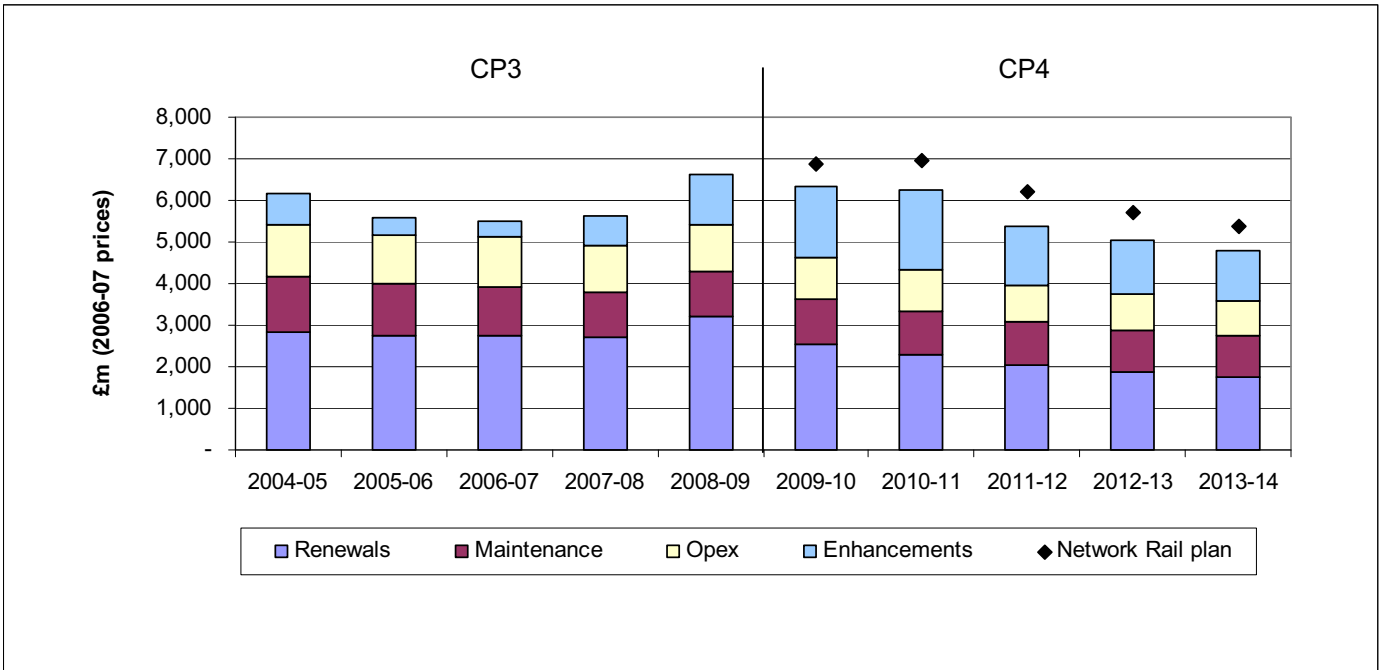
£m (2006-07 prices)	2009-10	2010-11	2011-12	2012-13	2013-14	Total
Maintenance	1,020	961	910	868	825	4,584
Controllable opex	728	702	678	654	631	3,392
Non-controllable opex	328	349	360	367	372	1,776
Renewals	2,561	2,302	2,031	1,864	1,745	10,504
Enhancements	1,680	1,917	1,408	1,299	1,203	7,507
<b>Total</b>	<b>6,317</b>	<b>6,231</b>	<b>5,386</b>	<b>5,052</b>	<b>4,777</b>	<b>27,763</b>



**Figure 12.1: Actual expenditure in CP3 (forecast for 2008-09) and our CP4 judgements – England & Wales**



**Figure 12.2: Actual expenditure in CP3 (forecast for 2008-09) and our CP4 judgements – Scotland**



**Figure 12.2: Actual expenditure in CP3 (forecast for 2008-09) and our CP4 judgements – Great Britain**

# **PART C: FINANCIAL FRAMEWORK AND THE REVENUE REQUIREMENT**



# 13. Overview of the financial framework and revenue requirement

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## Introduction

- 13.1 This part of the document sets out our determinations on the financial framework, including the rules governing the ring-fenced fund, the re-opener provisions and the methodology for logging up capex overspend. It also sets out our determinations 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.
- 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, we set out our proposed decisions on the majority of the financial framework for Network Rail in CP4, including 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 determinations, 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

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## Introduction

14.1 This chapter sets out our determination of the high-level financial framework for CP4 and Network Rail's allowed return. It includes the approach on the rules governing the ring-fenced investment fund and the interaction with the re-opener provisions.

## 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.<sup>56</sup> We therefore proposed to establish a financial framework for Network Rail that strengthens financial incentives at the corporate level.

14.3 In our February 2008 PR08 update document and February 2007 Advice to Ministers, we set out our proposed decisions on the high-level financial framework for Network Rail in CP4. In particular we said that:

- we continue to support Network Rail's intention that the use of the FIM will be restricted from the start of CP4 so that it can only be used to refinance existing debt. This means that Network Rail will need to raise debt without the support of a government guarantee from early in CP4;
- 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. This fee will be payable annually on the expected nominal value of outstanding FIM-backed debt;
- Network Rail will be provided with an allowed return that reflects its risk adjusted cost of capital;
- 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:
  - a risk buffer, to enable Network Rail to manage business risk and normal fluctuations in cash flow. To the extent that Network Rail does

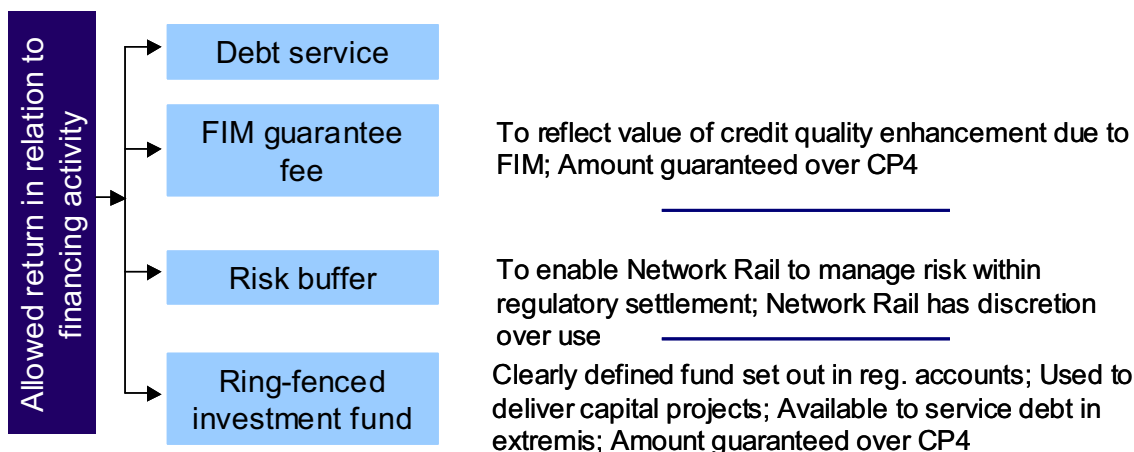
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<sup>56</sup> *Enhancing Incentives for Continuous Improvements in Performance*, Office of Rail Regulation, July 2006. This may be accessed at [www.rail-reg.gov.uk/upload/pdf/298.pdf](http://www.rail-reg.gov.uk/upload/pdf/298.pdf). The document provides greater analysis of the impact of the current financial structure on incentives.

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 deliver HLOS outputs except in instances of significant underperformance by Network Rail. The RFF provides a mechanism for deferring outputs to generate more net cash flow in the event that unplanned expenditure is sufficiently large to threaten Network Rail’s ability to finance its business efficiently.

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 central to our objective 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 determinations 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 of systematic issues 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 determinations.
- 14.9 We are strongly of the view that the new financial framework offers 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 new financial framework is expected to result in savings greater than the additional costs of unsupported debt, even within CP4.<sup>57</sup>
- 14.10 Government is clear that unsupported lenders cannot assume that government will step in if Network Rail gets into financial difficulties. This is integral to the incentives in the new financial framework.
- 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 recently 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 publish current and forward looking key financial information, including financial ratios, on a regular basis.

## Implementing the restriction of use of the FIM

- 14.13 We support Network Rail's intention that the use of the FIM will be restricted from the start of CP4. Any additional debt will need to be raised on an unsupported basis. To implement the restriction, we propose to make it a

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<sup>57</sup> 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 at 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>.

condition of Network Rail's licence that the company does not draw on the FIM to raise additional debt after 31 March 2009.<sup>58</sup>

- 14.14 We understand that DfT also supports restricting 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.
- 14.15 We therefore expect DfT to want to amend the terms of the FIM accordingly if and when it is content that the necessary mechanisms are in place.

## **Rules governing the ring-fenced investment fund**

- 14.16 As set out above, a part of Network Rail's allowed return will be allocated to 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.<sup>59</sup>
- 14.17 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.
- 14.18 However, Network Rail may, at its discretion, defer the RFF-funded capex to release net cash flow for debt service in the event that unplanned expenditure is greater than can be absorbed by the risk buffers. Network Rail's discretion in deferring RFF-funded capex will be subject only to the requirements of the re-opener process, which are set out below.
- 14.19 The remainder of this section sets out the detailed rules for the operation of the RFF taking account of the feedback from stakeholders on the approach proposed in February 2008.

### *Requirements on Network Rail to deliver ring-fenced fund projects*

- 14.20 Under its network licence, Network Rail will be required to deliver all HLOS and other required outputs (subject to the specified change mechanisms).
- 14.21 However, Network Rail will have full discretion to defer delivery of capex funded through the RFF under defined circumstances. Should Network Rail's costs be significantly greater than those assumed in our regulatory determination, leading to difficulties in financing its business, the company will be able to defer capex to meet this overspend in line with the provisions of the RFF.

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<sup>58</sup> We are consulting on the proposed changes to the licence (see chapter 4).

<sup>59</sup> 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.

*Defining the outputs contained in the ring-fenced fund*

14.22 It is for DfT and Transport Scotland to determine which HLOS outputs should form part of the RFF and be capable of deferral. The process therefore allows the DfT and Transport Scotland a defined period within which they may specify the projects that should be deferred from the list of projects capable of deferral at that point. If this information is not provided within the 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 Network Rail overspend*

14.23 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 through increased borrowing. If Network Rail meets or exceeds the regulatory assumptions in CP4, all specified outputs should be delivered, including those funded through the RFF.

14.24 Should Network Rail start to overspend versus the determination, we would expect it to accommodate this by using the capacity provided to it through our determinations to raise additional debt. The extent of this capacity, determined by the financial markets, will depend both on 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 effectively without limit (subject to the licence condition which prohibits Network Rail's financial indebtedness exceeding 90% of the value of the RAB).

14.25 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 (though it will need to finance the overspend within the control period). This mechanism should support Network Rail's ability to borrow within the control period.

14.26 Should Network Rail's overspend be sufficiently large to exhaust its ability to fund any overspend efficiently within the capacity for borrowing provided by our determinations, including that provided by the logging up arrangements, the determinations may need to be re-opened (see below).

14.27 If the determination is not re-opened and there is no interim review, Network Rail will need to deliver its outputs within its original CP4 settlement, deferring RFF funded outputs if necessary.

*RFF process*

14.28 If it becomes apparent that Network Rail will need to defer RFF expenditure and outputs, Network Rail will need to:

- notify us that this is the case; and
- set out to us and discuss with us a recovery plan, including indication of when deferred RFF outputs are likely to be re-instated.

14.29 Government will then be given one calendar month to specify exactly which projects it would want to be deferred.

14.30 If government does not do this within the time provided or if Network Rail's financial position deteriorates sufficiently before government has had chance to respond, Network Rail will have full discretion as to which outputs to defer.

*Split between England & Wales and Scotland*

14.31 Importantly, if government does not do this within the time provided or if Should Network Rail need to defer outputs funded by the RFF, the split between England & Wales spend deferred and Scotland spend deferred would reflect the sources of overspend compared to our determinations in each geographic area. Should the overspend be attributable entirely to one geographical area, say England & Wales, then only England & Wales outputs would be deferred in the first instance. However, if the overspend were sufficiently large, outputs across the whole network (including Scotland) could be deferred.

14.32 Should overspend be related entirely to one geographical area and be sufficiently large to require RFF 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.

14.33 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 funded by the RFF in the geographical area where the overspend has not occurred. In particular, the additional funding would not be available to service debt under any circumstances.

*Consequences for Network Rail of deferral of outputs funded by the RFF*

14.34 There will be clear adverse consequences for Network Rail and its management if it defers RFF projects. In particular:

- such deferral would amount to a very real and public failure on the part of Network Rail's management to deliver its required outputs efficiently, causing reputational damage to both the company and its management; and



- it is likely that managers' remuneration will already have been adversely affected before outputs funded by the RFF are deferred, since financial under-performance will be reflected in the 'financial efficiency index' contained in the management incentive plan. Nevertheless, we believe that there is merit in Network Rail including within its MIP a direct link to the deferral of outputs funded by the RFF. We have had confirmation from Network Rail's remuneration committee that, in setting bonuses, they will explicitly take into consideration the company's financial performance, including any deferral of RFF projects and changes in credit rating.

14.35 Network Rail should therefore face strong incentives to avoid being in a position where it has to defer projects funded by the RFF.

14.36 In February 2008, we said that we were also considering whether the FIM fee payable by Network Rail to DfT should increase in the event that Network Rail defers outputs funded by the RFF. This could have value in terms of the signal it would provide to lenders. However, we have decided not to adopt this approach on the basis that it may exacerbate an already difficult situation.

### Triggering a re-opener

14.37 Our determinations 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. In such circumstances, the determination may need to be re-opened, resulting in an interim review.

14.38 In February 2008, we proposed that we:

- retain the material change in circumstance re-opener provision;
- within the material change in circumstance provision, explicitly enable Network Rail 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, a reduction in outputs or a deferral of outputs funded by the RFF. In the interests of simplicity, rather than define the point at which this occurs explicitly, we proposed that the onus should be on Network Rail to notify us if it considers that this is likely to occur, based on audited 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; and
- provide a separate Scotland re-opener, which would trigger ahead of the GB-wide re-opener. This trigger would be defined in terms of a percentage deviation in Scottish spend versus the Scotland component of the determination. So that the incentives on Network Rail with respect to overspend are equal between England & Wales and Scotland, we said that

the percentage deviation in spend necessary to trigger the Scotland re-opener should be based on an estimate of the percentage deviation in GB spend necessary to trigger the GB-wide re-opener.

- 14.39 We have now completed our financial modelling. 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 an interim review in Scotland only (i.e. we assume only Scotrail's track access 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.
- 14.40 We have tested the appropriateness of this approach with credit rating agencies and lenders, and taken account of the views of consultees.

*Additional quantified re-opener*

- 14.41 Following further discussions with stakeholders as well as lenders and rating agencies, we believe it is appropriate to add to the above a quantified GB re-opener provision, 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)).
- 14.42 The AICR threshold level will be 1.35x for the forward three-year average based on Network Rail's audited 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.
- 14.43 Network Rail will need to calculate its current and forward-looking (at least to the end of CP4) key financial ratios anyway (for internal purposes, for lenders and to meet its regulatory information provision requirements). The approach should not, therefore, create an additional regulatory burden.
- 14.44 The level of the threshold is set so that the mechanism may be triggered and RFF-fund capital expenditure deferred (releasing net cash flow for debt service) before Network Rail experiences significant financing difficulties.
- 14.45 We believe that the addition of this quantified re-opener provision should provide both government and lenders with assurance that any significant overspend by Network Rail will be assessed and addressed in an appropriate and timely manner. It should also increase the reputational incentives on Network Rail as it would need to strive to maintain its financial ratios above the threshold level (i.e. to ensure good financial performance).

### *Triggering a re-opener*

14.46 We consider that for each of the re-openers set out above that the test as to whether the terms of the provision have been met and an interim review should follow should continue to include an assessment (as is currently the case) against our section 4 duties.

14.47 There will be a two stage process to triggering the quantified re-opener:

- Stage 1: Should Network Rail believe that it is, or is likely to be, unable to deliver all its regulatory outputs (including RFF projects) 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 need to inform us that this is the case and 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 have been impacted; and
- the actions (if any) it has taken to mitigate the change in efficient costs.
- 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 determinations 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 re-open the determination only in that region.

- 14.48 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 RFF projects if it deems it necessary to continue to finance its activities efficiently.
- 14.49 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.
- 14.50 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.<sup>60</sup> 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,<sup>61</sup> but will be expanded to cover enhancement expenditure under the logging up mechanism.

#### *Undertaking an interim review*

- 14.51 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.
- 14.52 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.
- 14.53 We would not generally expect to reassess the regulatory framework unless the particular circumstances of the re-opener suggested that this was appropriate.
- 14.54 We would then provide Network Rail with a new determination.
- 14.55 Importantly, if during the process of conducting an interim review, Network Rail's financial position should deteriorate to the extent that it needs to defer RFF expenditure, the company would have full discretion to do this. The

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<sup>60</sup> Our most recent Network Rail Quarterly Monitor may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/273.pdf>.

<sup>61</sup> Our latest assessment of Network Rail's performance on efficiency can be found in chapter 8 of our *Annual Assessment of Network Rail 2006-07*, Office of Rail Regulation, September 2007. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/339.pdf>.

deferred RFF projects may then be restored as part of the new regulatory settlement.

- 14.56 We intend to publish a full procedural document that sets out how the re-opener provisions could be triggered and how we would conduct an interim review. This will sit alongside our October 2008 final determinations. We will consult on a draft version of the procedural document shortly.

## Allowed return

- 14.57 We said in our advice to ministers that we will provide Network Rail with an allowed return for CP4 that reflects its risk-adjusted cost of capital. We also stated that, in determining the cost of debt within the overall allowed return, we intend to 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. CEPA have been advising us on the appropriate cost of capital for Network Rail.
- 14.58 Our September 2007 financial issues update and further consultation letter<sup>62</sup> 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).<sup>63</sup> 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%.
- 14.59 The purpose of indexation would be to reduce the interest rate risk facing Network Rail, and therefore enable us to take a less cautious approach to setting the allowed return. As stated in our February update paper, we have decided not to index Network Rail's allowed return in CP4.
- 14.60 Since CEPA conducted its initial study, there have been material changes in financial market conditions. We have also gained further clarity from Network Rail on its intended financing strategy for the forthcoming control period.
- 14.61 We therefore asked CEPA to update its report to take these factors into account. Its updated study provides a range of 4.5% - 4.9% for Network Rail's cost of capital, with 4.7% - 4.9% being its preferred range.<sup>64</sup> The increase in its figures reflects, in particular, the greater volatility and uncertainty exhibited by financial markets recently. 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.

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<sup>62</sup> This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/pr08-financial-issues-let-060907.pdf>.

<sup>63</sup> 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.

<sup>64</sup> *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>.

- 14.62 In addition, we commissioned a study from First Economics<sup>65</sup> 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 water sectors.
- 14.63 Network Rail put forward a figure of 4.8% for the allowed return in its SBP update. This is higher than the 4.5% set out in its SBP. However, the figure set out in its SBP update, in our view, reflected an overly pessimistic view of the financial markets going forward.
- 14.64 We have reviewed the available evidence and will set the allowed return at 4.7% on a real vanilla basis. This figure is based on the assumption that there is no material change in credit market conditions for a borrower like Network Rail. We will monitor the developments in the financial markets and, if necessary, reassess the allowed return ahead of our final determinations.

#### *Regulatory precedent*

- 14.65 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.
- 14.66 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.<sup>66</sup>

#### *Disaggregating the allowed return for England & Wales and Scotland*

- 14.67 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.
- 14.68 Based on our understanding of the relative risk profiles of Network Rail's activities in each region and our financeability analysis (see below), we do not believe that there is a strong case for differentiating the allowed return

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<sup>65</sup> *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>.

<sup>66</sup> The Competition Commission's final report is available at [www.competition-commission.org.uk/rep\\_pub/reports/2007/fulltext/532.pdf](http://www.competition-commission.org.uk/rep_pub/reports/2007/fulltext/532.pdf).

between England & Wales and Scotland. The allowed return will therefore be 4.7% both in England & Wales and in Scotland.

#### *The FIM fee*

14.69 The fee payable to DfT for the provision of the FIM will be set at 80bp 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. The fee will be fixed for CP4 based on the nominal level of FIM-backed debt outstanding on 1 April 2009. Where the average annual level of FIM-backed debt actually outstanding fluctuates resulting in a higher / lower level of fee payable, the difference in the FIM fee payable will be logged up and made good from the beginning of CP5. Our assumption is that the FIM fee paid by Network Rail to government in CP4 will be £878m (in nominal terms).

#### *The risk buffer*

14.70 The risk buffer will be set at an annual average of £246m (in nominal 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.<sup>67</sup> The risk buffer will be split into £218m for England & Wales and £28m for Scotland (both in nominal 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.

#### *The ring fenced fund*

14.71 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 nominal terms, the RFF will therefore average £310m per annum for GB as a whole. This is equivalent to 21% of enhancement expenditure and 9% of total capital expenditure during CP4. The RFF will be split into £281m on average for England & Wales and £29m for Scotland.

14.72 If RFF outputs are deferred, the outputs to be deferred will, in the first instance, reflect the geographic areas where the overspend is incurred. However, Network Rail will retain the right to defer all RFF outputs if necessary regardless of the area where the overspend is incurred. Any discrepancy between geographic area of the overspend and the deferral of RFF outputs will need to be made good at the next periodic review.

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<sup>67</sup> Oxera, October 2006, *What is the necessary margin for Network Rail to accommodate risk?* The study is available at <http://www.rail-reg.gov.uk/upload/pdf/pr08-isbp-oxera.pdf>.

## Corporation tax

- 14.73 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 the February 2008 advice to Ministers that we intend to provide Network Rail with a specific ex ante corporation tax allowance.
- 14.74 We also said in the February 2008 advice to Ministers 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).
- 14.75 The Competition Commission (CC) has also said in a recent report<sup>68</sup> 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. DfT and Transport Scotland have said in their responses<sup>69</sup> to the September 2007 financial issues letter<sup>70</sup> that they support making an adjustment for this double counting.
- 14.76 Network Rail, in its response to the 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's 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.
- 14.77 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.

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<sup>68</sup> *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>.

<sup>69</sup> The responses may be accessed at <http://www.rail-reg.gov.uk/server/show/ConWebDoc.9055>.

<sup>70</sup> *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](http://www.rail-reg.gov.uk/upload/pdf/pr08-financial-issues-let-060907.pdf).



- 14.78 We have done some analysis on the possible size of the double count and our estimate is £1.3bn. We will confirm the amount in the final determinations. We will make this adjustment by holding the amount of the estimated double count on account and only start funding Network Rail for corporation tax when this account has been exhausted by actual corporation tax payments.
- 14.79 The full details of the methodology for calculating the CP4 corporation tax allowances, our approach to the roll forward of corporation tax balances into CP5; and the size of the double count will be published in a letter to Network Rail shortly and in our final determinations.



# 15. The regulatory asset base and amortisation

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## Introduction

15.1 This chapter sets out our determinations on 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 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 will retain the high-level principles adopted for CP3<sup>71</sup> 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 2006-07 audited regulatory accounts and Network Rail’s forecasts included in its SBP update for 2007-08 and 2008-09. The adjustments are made for items such as additional investments not funded at the time of ACR03, the revenue due to be received by Network Rail in CP3 that we agreed in March 2004

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<sup>71</sup> *Access Charges Review: Final conclusions*. Office of Rail Regulation, December 2003. This document can be accessed at <http://www.rail-reg.gov.uk/upload/pdf/184.pdf>.

could be deferred and instead added to the opening CP4 RAB, and additions for the volume incentive and asset stewardship incentive. This gives a RAB of £28.8bn in England & Wales and £3.3bn in Scotland, giving a total RAB for Great Britain of £32.1bn. 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.

- 15.5 For the RAB adjustments that we are making for these determinations we are assuming that Network Rail will achieve the forecast level of capital expenditure it included in the SBP update for 2008-09. Those forecasts include a 19% increase in renewals expenditure and a 175% increase in enhancement expenditure over the level achieved in 2007-08. Historically, Network Rail has tended to undershoot its forecasts of renewals and enhancements spend, so we will review this position for the October 2008 final determinations.
- 15.6 We outlined in previous documents that if Network Rail fails to deliver any required outputs in CP3, then it will not retain the associated financial benefit.
- 15.7 Network Rail has identified a number of areas where it is deferring renewals spend. Given that this will represent a reduction in outputs in CP3 we will deduct 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 think that it is appropriate, we have included the deferred expenditure as part of our determinations. Network Rail has proposed to offset some of the deferred expenditure with other worthwhile schemes. We are minded to allow for these in determining the net amount by which the RAB should be reduced as long as Network Rail provides us with sufficient justification for the additional schemes and that they are sure to proceed.
- 15.8 There are also some enhancement schemes that will not be completed in CP3, for example telecoms enhancements or funds provided for in CP3 that have not been fully utilised, for example the safety and environment fund. We are still discussing these issues with Network Rail and in particular the level of expenditure that will be committed this year, even if it will not all be spent. For now, we have made indicative estimates but we might need to make further adjustments for the October 2008 final determinations.
- 15.9 We have assumed for these determinations that the total deduction from the RAB at 31 March 2009 for renewals and enhancements that have not been delivered (net of additional renewals schemes) will be £750m (including capitalised financing).
- 15.10 The proposed RAB adjustments take into account forecast expenditure in 2008-09, 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

and net debt movements used in our October 2008 final determinations document.

15.11 We have also asked the auditors of Network Rail’s regulatory accounts to check that the RAB additions are in line with the CP3 policies, for example that the boundary between renewals/enhancements and maintenance is the same as we used in ACR03 and the capitalisation of overheads is also on the same basis as in ACR03.

**Table 15.1: Adjustments for the CP4 opening RAB in England & Wales**

£m (2006-07 prices)	Adjustment in 2004-05	Adjustment in 2005-06	Adjustment in 2006-07	Adjustment in 2007-08	Adjustment in 2008-09	Total
<b>Opening RAB for the year per ACR03</b>	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)
<b>Closing RAB for the year per ACR03</b>	20,356	22,088	23,204	24,276	25,105	25,105
<b>Adjustments to the RAB post ACR03</b>						
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	(7)	(13)	(298)
Investments not funded in ACR03	37	27	141	305	729	1,239
Deferrals of ACR03 renewals and enhancements	(109)	(146)	(135)	(104)	(239)	(733)
<b>Total adjustments to RAB post ACR03</b>	(860)	(143)	54	272	683	6
<b>Adjusted Closing RAB for the year</b>	19,495	21,084	22,254	23,599	25,111	25,111
<b>Adjustments to opening CP4 RAB</b>						
Deferred Grants to be added to the RAB						3,033
Asset stewardship incentive						301
Volume incentive						346
<b>1 April 2009 RAB</b>						<b>28,791</b>

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)	Adjustment in 2004-05	Adjustment in 2005-06	Adjustment in 2006-07	Adjustment in 2007-08	Adjustment in 2008-09	Total
<b>Opening RAB for the year per ACR03</b>	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)
<b>Closing RAB for the year per ACR03</b>	2,419	2,588	2,663	2,732	2,780	2,780
<b>Adjustments to the RAB post ACR03</b>						
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	13	105	120
Deferrals of ACR03 renewals and enhancements	-	-	-	-	(24)	(24)
<b>Total adjustments to RAB post ACR03</b>	(37)	(2)	(1)	10	79	49
<b>Adjusted Closing RAB for the year</b>	2,382	2,549	2,624	2,702	2,829	2,829
<b>Adjustments to opening CP4 RAB</b>						
Deferred Grants to be added to the RAB						381
Asset stewardship incentive						38
Volume incentive						35
<b>1 April 2009 RAB</b>						<b>3,283</b>

Note: All adjustments include capitalised financing and amortisation adjustments, where appropriate.

## Rolling forward the RAB in CP4

15.12 Generally, ex ante forecast renewals and enhancement expenditure is added to the RAB in CP3 and adjustments are not made for actual efficiently incurred expenditure. 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, in the wider context of the other financial protections for Network Rail in the regulatory framework.

15.13 In our February 2008 update on the framework for setting outputs and access charges, we stated 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.

15.14 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.

15.15 We did not say in February 2008, however, exactly how this would be done. The methodology is set out below.

### **Logging down capex underspend**

15.16 The purpose of the logging down mechanism is to provide appropriate incentives on Network Rail to deliver capex efficiencies, but ensure that it does not benefit from failure to deliver required outputs. In dealing with capex underspends, we will therefore distinguish between those arising from efficiency gains and those due to the non-delivery of outputs.

15.17 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. After five years, the RAB will be reduced to reflect the underspend.

15.18 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.

15.19 Where Network Rail has underspent on its capex programme but this is due to a failure to deliver required outputs, at the beginning of CP5, we will reduce the RAB to reflect this and ensure that Network Rail does not benefit financially from failing to deliver outputs. Failure to deliver required outputs may also result in us taking enforcement action in line with our published policy.

15.20 This approach is consistent with that taken by other UK regulators.

15.21 Our assessment of the amount to be logged down with regards efficient underspend will be carried out annually, as part of our Annual Assessment

process. 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. 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

- 15.22 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.
- 15.23 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 regulatory settlement.
- 15.24 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.
- 15.25 Our assessment of the amount to be logged up will be carried out annually, as part of our annual assessment process. We will state in our annual assessment the amount to be logged up for inclusion at the beginning of the next control period.
- 15.26 It is important to note that logging up could be cancelled out by logging down later in the control period, as per the methodology set out in paragraphs 15.16 – 15.21. This should minimise the scope for gaming the settlement by Network Rail and also ensure that the final amount to be logged up is based on a picture of Network Rail's performance over the full control period.
- 15.27 Where an amount is logged up for inclusion in the RAB, Network Rail will also be able to log up the associated efficient financing costs based on its prevailing allowed return for remuneration in CP5.

### *Additional outputs*

- 15.28 Where government requests Network Rail to deliver additional outputs during the control period, we will log up the efficient cost (including financing costs) of delivering the outputs for inclusion in the RAB at the beginning of the next control period. This is unchanged on the current approach.

### *Self-financing investment*

- 15.29 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 provided that the company demonstrates that it had a strong business case and followed a sound appraisal process.

*Overspend associated with delivery of required outputs*

- 15.30 For capex overspend relating to required outputs, the overspend will be assessed at the aggregate level. Consequently, where Network Rail's capex spend is in line with or below that set out in the regulatory determination, actual capex spend would be added to the RAB (subject to Network Rail retaining the benefit for 5 years if it was deemed to be efficient underspend), regardless of whether Network Rail can point to additional volumes versus those assumed.
- 15.31 In assessing the amount of any overspend to be logged up, we will differentiate between renewals and enhancement expenditure.
- 15.32 **Renewals:** In the case of renewals, the inclusion of overspend in the RAB will be based on an ex-post efficiency assessment, making the hurdle for logging up overspends relatively high. 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.
- 15.33 Any overspend relating to unit costs will be disallowed. This is because unit costs are at least partially controllable by Network Rail, and the company is provided with protections elsewhere in the regulatory settlement. In particular:
- we have built into our efficiency assumption for CP4 an explicit input price allowance based on Network Rail's own study;
  - the regulatory settlement provides a degree of 'headroom', enabling Network Rail to absorb 'normal' fluctuations in cash flow, including those relating to unit costs;
  - we have said that we will use the efficient level of debt to determine allowed revenues for CP5. This will include any debt relating to uncontrollable input price inflation beyond the ex ante assumption; and
  - ultimately, Network Rail would have recourse to the re-opener provisions.
- 15.34 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 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 in 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 need for increased renewals, in line with asset policy. 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.

**15.35 Enhancements:** In the case of enhancement spend:

- we will not make RAB additions for increased volumes relating to enhancement projects where there is a tailored protocol in place, e.g. for Thameslink or where fixed price agreements are in place, e.g. for Airdrie – Bathgate; and
- for enhancement projects not covered by a tailored protocol, we will adopt a mechanistic approach to logging up overspend. In particular, we will log up 75% of any aggregate overspend, subject to Network Rail absorbing the first £75m of overspend in each year, and any manifestly inefficient overspend being disallowed. Network Rail will need to set out to us why the overspend should not be considered manifestly inefficient. This £75m will be split between England & Wales and Scotland (on the basis that 11% is allocated to Scotland).

15.36 Given the early stage of development of most projects and therefore the complexities associated with setting out upfront the baseline output specification against which overspend could be judged given, we believe that this approach provides an appropriate balance between improving incentives and the regulatory burden. It is also consistent with the treatment of Thameslink, the largest capex project in CP4.

15.37 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.

- 15.38 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.
- 15.39 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.

### **Non-capex additions to the RAB in CP4**

- 15.40 In line with regulatory good practice, we have decided that only capex should be added to the RAB from the start of CP4. Incentive payments, which ORR has historically added to the RAB at the start of the next control period, will instead be made 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 of time which we propose would generally be across the subsequent control period. Respondents to our September 2007 financial issues consultation letter supported this approach.

### **Accounting treatment of reactive maintenance**

- 15.41 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 cost following a change to UK GAAP (generally accepted accounting principles). In order to improve transparency we proposed to remunerate these reactive

maintenance costs in the year concerned (i.e. for the purpose of calculating the revenue requirement, 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 should not have a material impact on the revenue requirement in CP4.

- 15.42 In its SBP and SBP update Network Rail did not identify these costs as maintenance; they remain under renewals expenditure. We have now received further explanation of these costs and a projection for CP4 from Network Rail. We will review these costs and if the cost projections are robust intend to alter the basis for including these costs in the calculation of the revenue requirement so that they are consistent with the statutory accounting treatment.

## Amortisation

- 15.43 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.
- 15.44 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.<sup>72</sup> 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).
- 15.45 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

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<sup>72</sup> *Approach to the amortisation of Network Rail's regulatory asset base*, Office of Rail Regulation, September 2006. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/pr08-amortisation-let-290906.pdf>.

customers and funders will be sharing the cost burden of Network Rail's degree of inefficiency.

15.46 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 (just over £4bn). We propose to do this on a straight-line basis over 30 years.

15.47 In total this gives an amortisation charge of some £1.4bn per annum. The table below summarises our calculation of amortisation and the split between England & Wales and Scotland.

**Table 15.3: Calculation of amortisation**

£m (2006-07 prices)	GB	Scotland	England & Wales
Pre-efficient long-run annual average renewals	2,044	250	1,794
Catch-up efficiency (renewals)	36%	36%	36%
Post efficient long-run annual average renewals	1,308	160	1,148
Amortisation of non-capex RAB additions	138	15	123
<b>Total amortisation per annum</b>	<b>1,446</b>	<b>175</b>	<b>1,271</b>



## 16. Revenue requirements

### Introduction

16.1 This chapter sets out our determinations 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 determinations for the gross revenue requirement for England & Wales, Scotland and Great Britain.

16.3 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.

**Table 16.1: Draft determination of 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	922	867	820	782	743	4,133	4,506
Controllable opex	661	638	615	594	573	3,081	3,429
Non-controllable opex	302	319	330	337	341	1,631	1,649
Schedule 4 and 8	200	184	181	154	150	868	871
Allowed Return	1,376	1,482	1,573	1,641	1,701	7,773	7,947
Amortisation	1,271	1,271	1,271	1,271	1,271	6,353	7,620
Tax	-	-	-	-	-	-	68
<b>Gross revenue requirement</b>	<b>4,731</b>	<b>4,762</b>	<b>4,789</b>	<b>4,779</b>	<b>4,778</b>	<b>23,839</b>	<b>26,090</b>

**Table 16.2: Draft determination of 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	99	94	90	86	82	451	483
Controllable opex	67	64	62	60	58	311	348
Non-controllable opex	26	30	30	31	31	146	147
Schedule 4 and 8	13	12	12	10	10	56	56
Allowed Return	157	168	176	180	180	860	909
Amortisation	175	175	175	175	175	875	1,070
Tax	-	-	-	-	-	-	17
<b>Gross revenue requirement</b>	<b>536</b>	<b>542</b>	<b>544</b>	<b>541</b>	<b>535</b>	<b>2,699</b>	<b>3,029</b>



**Table 16.3: Draft 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	1,020	961	910	868	825	4,584	4,989
Controllable opex	728	702	678	654	631	3,392	3,777
Non-controllable opex	328	349	360	367	372	1,776	1,796
Schedule 4 and 8	212	196	192	164	159	924	927
Allowed Return	1,532	1,650	1,748	1,821	1,881	8,633	8,856
Amortisation	1,446	1,446	1,446	1,446	1,446	7,230	8,690
Tax	-	-	-	-	-	-	85
<b>Gross revenue requirement</b>	<b>5,267</b>	<b>5,304</b>	<b>5,334</b>	<b>5,320</b>	<b>5,314</b>	<b>26,539</b>	<b>29,119</b>

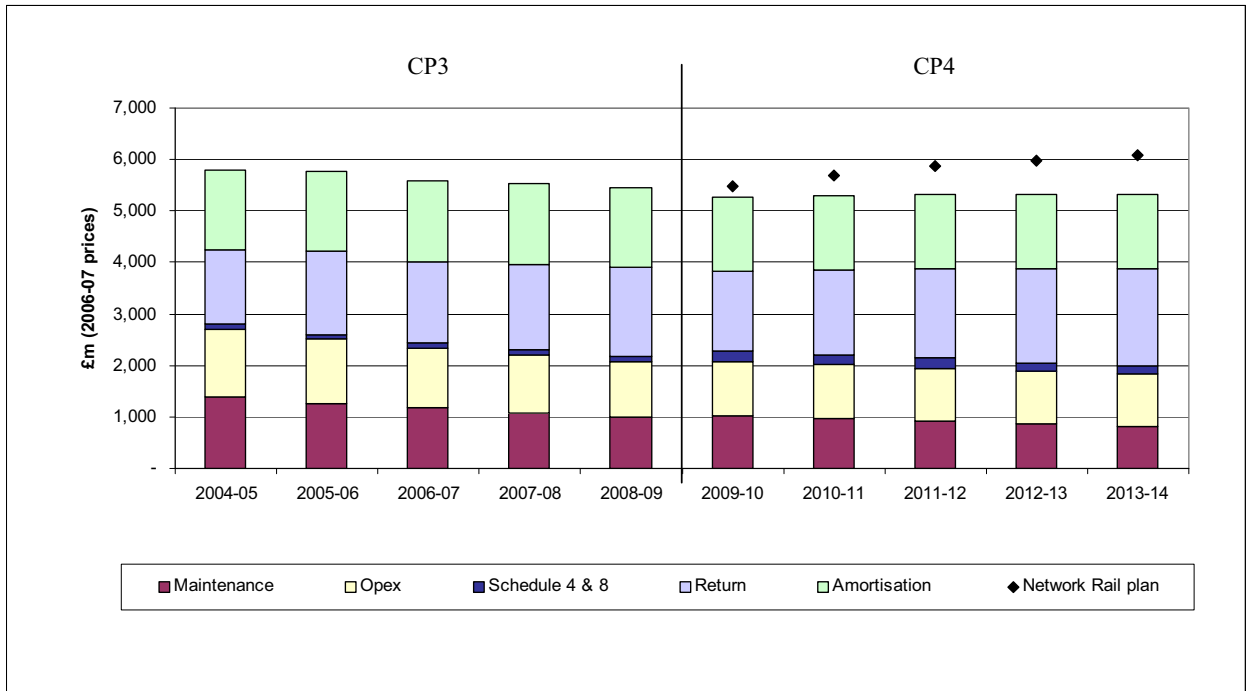


Figure 16.1: Gross revenue requirement in CP3 and CP4

# 17. Financeability

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## Overview

- 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 determinations, 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.
- 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 2008.<sup>73</sup> We confirmed that our determinations would, in our view, be consistent with Network Rail obtaining a solid investment grade credit rating on the basis that it operates efficiently.<sup>74</sup> We also said that we would assess financeability 'in the round'. In other words, we will 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 determinations as a whole to inform our assessment.
- 17.3 Ultimately it is for the ratings agencies to decide the credit rating for Network Rail. They will assess the financial strength of the company, the risks that Network Rail faces, the regulatory framework, the quality of the company's management and the provisions contained in these proposals to maintain financial ratios in the event of unanticipated expenditure variations. The agencies do not have a shared view of these factors and all place emphasis on different elements in forming their opinions.

## *Solid investment grade and financial indicators*

- 17.4 We interpret a solid investment grade credit rating to be BBB+/Baa1 or above.<sup>75</sup> This is consistent with the view expressed by the Competition Commission in its 2007 report on the economic regulation of Heathrow and

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<sup>73</sup> *Periodic Review 2008: Financial issues update and further consultation*, Office of Rail Regulation, 6 September 2007. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/pr08-financial-issues-let-060907.pdf>.

<sup>74</sup> 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.

<sup>75</sup> The BBB+ terminology is used by Standard and Poor's and Fitch Ratings. Baa1 is used by Moody's.

Gatwick airports.<sup>76</sup> A rating at these levels means that there is a low probability of default.

- 17.5 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
Debt/RAB	Net debt / RAB
FFO*/interest	FFO <i>divided by</i> net interest**
Adjusted RCF***/debt	FFO less net interest less renewals and enhancements funded by the ring fenced fund <i>divided by</i> 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. \*\*\* Retained cash flow (RCF) is defined as FFO minus net interest.

### *Financing assumptions*

- 17.6 We have said that in assessing the financeability of our determinations, 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.
- 17.7 Network Rail provided us with a financing plan on a confidential basis alongside its SBP update in April this year. 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 from the business.

<sup>76</sup> 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>.

- 17.8 This is a slight 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.
- 17.9 As explained in chapter 14, part of Network Rail’s allowed return will, in normal circumstances, be used to deliver outputs funded by the RFF. However, chapter 14 also explains that Network Rail will ultimately be able to defer this expenditure and hence outputs, at its discretion, in the event that it would otherwise have difficulty financing its business efficiently. Since this expenditure can be deferred and is therefore available for Network Rail to service its debt, we have included it as free cash flow in the calculation of the financial ratios.
- 17.10 We have considered financeability at the GB level only, as we expect Network Rail to continue to finance itself on a GB-wide basis.

*Our assessment of Network Rail’s financeability*

17.11 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**

£m (nominal prices)	2009-10	2010-11	2011-12	2012-13	2013-14	Annual average
AICR	1.73x	1.65x	1.64x	1.60x	1.62x	1.65x
Debt / RAB (Gearing)	62.1%	62.5%	62.0%	61.3%	60.3%	61.6%
FFO / Interest	3.38x	3.11x	2.99x	2.89x	2.87x	3.05x
Adjusted RCF / Debt	8.8%	8.0%	7.8%	7.4%	7.4%	7.9%

17.12 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 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.<sup>77</sup>

### *Sensitivity testing*

- 17.13 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 used Monte Carlo simulation to help identify the robustness of Network Rail's financial position in the face of cost and revenue uncertainty.<sup>78</sup>
- 17.14 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.
- 17.15 Based on the Monte Carlo simulation, we consider that our determinations should enable Network Rail to maintain a solid investment grade credit rating in the face of a range of fluctuations in cash flow.

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<sup>77</sup> As noted above, First Economics conducted a study for us examining the risks faced by Network Rail compared to those faced by other regulated network industries.

<sup>78</sup> Our Monte Carlo simulation generates a large number of possible outcomes for CP4 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 single till income

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### Overview

18.1 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.

18.2 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 or network grant in lieu of fixed track access charges.

18.3 We have undertaken extensive work in PR08 to ensure that we have an appropriate structure of access charges forms. The structure of access charges is important, because of the fundamental role charges play in decision making within the industry. Access charges serve three purposes:

- to enable Network Rail to recover the efficient costs it incurs in providing track and station infrastructure used by train operators;
- to allow those costs to be recovered from those that have caused them to be incurred; and
- to provide signals to train operators, their suppliers and funders to use and develop the infrastructure in an efficient way.

18.4 In the following chapters in this part of the document we set out our determinations 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.



# 19. Track access charges

## Introduction

- 19.1 This chapter sets out the levels for the track access charges we are determining for CP4. (The stations long term charge is covered in chapter 21.)
- 19.2 We are determining track access charges payable by franchised passenger train operators and open access passenger and freight train operators.
- 19.3 The chapter is structured as follows:
- background is provided to the work to reach our determinations;
  - 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 type);
    - 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 We are publishing the detailed price lists on our website in an accompanying document.
- 19.5 Table 19.1 shows the charges categorised by the type of train operator that pays them.

**Table 19.1: Access charges categorised by those who do or will pay them**

Type of charge	Payable by
Variable usage charge, electrification asset usage charge, capacity charge	All operators
Traction electricity charge	Franchised passenger, freight and open access passenger operators who run electrically powered services
Station long term charge	Franchised passenger, and other

	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

19.6 The above approach relates to the current capability, capacity and functionality of the network. Additional charges can be incurred where services require enhancements to the network. The principles behind such charges are set out in our investment framework.<sup>79</sup>

## Background

19.7 Access charges were first included in the track access contracts between train operators and Railtrack<sup>80</sup> as the first franchises were let. The current structure of access charges was largely determined at the periodic review 2000 for passenger train operators and the review of freight charging policy 2001 for freight train operators. Key features are:

- transparent and deterministic price lists for **variable track access charges** so that an operator who runs the same rolling stock will pay the same variable access charges (with the exception of different vehicle/commodity type charges for freight);
  - freight and other open access 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 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);

<sup>79</sup> Further details on our investment framework can be accessed on our website at <http://www.rail-reg.gov.uk/server/show/nav.190>. We will shortly be publishing updated guidance on how station long term charges change in response to investments under various different approaches.

<sup>80</sup> The original criteria for such charges for franchised passenger operators is 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 is accessible on our website at [http://www.rail-reg.gov.uk/upload/pdf/fgt-FMC\\_cmppte\\_230108.pdf](http://www.rail-reg.gov.uk/upload/pdf/fgt-FMC_cmppte_230108.pdf). The equivalent document for freight operators is also available on our website at <http://www.rail-reg.gov.uk/upload/pdf/21.pdf>.

- the **traction electricity charge** is calculated using modelled consumption rates from TRATIM,<sup>81</sup> where the prices were set for 1999-2000 and rebased each year following the index of average electricity prices (moderately large users index) (see below for further details including how this has recently been altered for franchised passenger operators). The traction electricity charge currently includes a mark-up to recover the **electrification asset usage charge**;
- the **capacity charge** reflects increased Schedule 8 costs from increases in traffic on the network, which make it harder for Network Rail to recover from performance incidents; and
- the **fixed charge** which 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.

19.8 Following PR2000, the primary focus of ACR03 was to determine the aggregate level of access charges. Only minor changes were therefore made to the structure of access charges with the intention of reviewing this in more detail before the next periodic review, in particular 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. Following ACR03, we undertook a specific review of the structure of costs and charges review in 2005 (SOCC review 2005), which covered a wide range of structure of charges issues.<sup>82</sup> However at the end of the 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.

## Our charging objectives

19.9 We have developed our objectives for the structure of charges in consultation with the industry during previous reviews and published these in chapter 2 of our PR08 June 2006 structure of track access and station charges document.<sup>83</sup> The 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;

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<sup>81</sup> A simulation model used to estimate the level of electricity consumption of different vehicles and on different types of route.

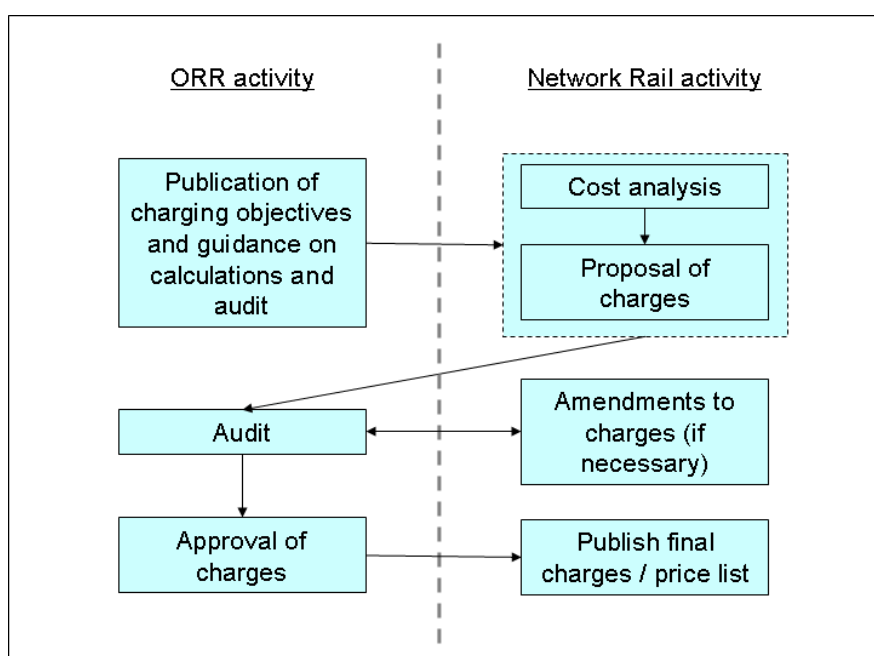
<sup>82</sup> Documentation from this review is accessible on our website at <http://www.rail-reg.gov.uk/server/show/nav.176>.

<sup>83</sup> *Structure of track access and station long term charges*, Office of Rail Regulation, June 2006. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/291.pdf>.

- 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

19.10 Network Rail is taking responsibility for the development of charge proposals for CP4, (although 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 19.1.



**Figure 19.1: Responsibilities for calculating and determining access charges**

19.11 The change 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).

- 19.12 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. However, with two years experience, we are broadly satisfied that the new arrangements have worked well, though there have been some specific instances where the company has not provided us in a timely way with the information we require. Network Rail has generally consulted well with the industry and has engaged positively with us. Once PR08 has finished we will review the arrangements with Network Rail and the industry and consider how the process may be improved.

### **Assessment of Network Rail's charge proposals**

- 19.13 Network Rail's charge proposals must adhere to our charging objectives and take account of our charging guidelines, which we set out in our June 2006 document. The company's charge proposals are 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 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.
- 19.14 We have reviewed Network Rail's updated proposals, aided by the independent reporters (who also assisted us in our review of the company's SBP charge proposals). We welcome Network Rail's charge proposals and the large amount of work that has gone into them. There are still a small number of issues that remain to be addressed by Network Rail and us between draft and final determinations (described below).
- 19.15 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.<sup>84</sup> 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

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<sup>84</sup> The ITS review may be accessed at [http://www.rail-reg.gov.uk/upload/pdf/cnslt-ITS\\_rev-NR\\_charg-props.pdf](http://www.rail-reg.gov.uk/upload/pdf/cnslt-ITS_rev-NR_charg-props.pdf).

SBP, particularly compared to European comparators. ITS also said that route based 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

- 19.16 The variable usage charge is designed to recover the costs of maintenance and renewals that vary with traffic; in economic terms this reflects the short-run incremental cost. In particular, this means that it 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.<sup>85</sup>
- 19.17 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.<sup>86,87</sup>
- 19.18 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. 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 small positive increment above this (5% was used after testing by Network Rail of the impact of different sized increments (the sensitivities were shared with us for review)). Table 19.2 shows Network Rail's projections of total income from variable usage charges in CP4, at end of CP3 efficiency levels.

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<sup>85</sup> 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 <http://www.rail-reg.gov.uk/upload/pdf/213.pdf>; and *Structure of costs and charges review: emerging views on key issues*, Office of Rail Regulation, April 2005. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/229.pdf>.

<sup>86</sup> Links to all PR2000 documentation may be accessed at <http://www.rail-reg.gov.uk/server/show/nav.00100a003004001>.

<sup>87</sup> 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 19.2: 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
<b>GB</b>						
Franchised passenger	153	154	158	159	159	784
Freight	75	75	76	77	80	382
Open access passenger <sup>88</sup>	14	14	14	14	14	71
<b>England &amp; Wales</b>						
Franchised Passenger	141	143	146	147	147	724
Freight	66	66	68	69	71	340
Open access passenger	14	14	14	14	14	71
<b>Scotland</b>						
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*

19.19 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.

<sup>88</sup> Estimated open access passenger income from variable usage charge as 75% of total open access income. Network Rail will need to provide a clear breakdown of income from open access passenger operators to us by the end of August 2008 for our final determinations.

19.20 As part of this assessment, the independent reporters Halcrow carried out a review of Network Rail’s proposed variable usage charges. Halcrow’s first report assessing the charges proposals Network Rail included with its SBP was completed alongside our assessment of Network Rail’s SBP and published on our website in February 2008.<sup>89</sup> Following the SBP update, Halcrow has reviewed Network Rail’s responses to the issues raised and recommendations made in its first report.<sup>90</sup>

19.21 In its SBP update Network Rail addressed the majority of the outstanding issues identified by Halcrow. For the areas where it did not make changes in response to the Halcrow recommendations it provided an explanation. Generally it said that the change would not have a material impact on the level of variable cost but it would be a consideration for further work in the future. In the light of our overall assessment and in particular Network Rail’s response to Halcrow’s recommendations and issues, we consider that Network Rail’s variable cost proposals are a reasonable basis for establishing variable usage charges for CP4.

*Cost variability with small changes in traffic*

19.22 Table 19.3 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 19.3: 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%

<sup>89</sup> Reporter mandate – variable usage charges, final report, Halcrow Group, February 2008. This can be accessed on our website at [http://www.rail-reg.gov.uk/upload/pdf/cnslt-var\\_usg\\_cost\\_halcrow.pdf](http://www.rail-reg.gov.uk/upload/pdf/cnslt-var_usg_cost_halcrow.pdf).

<sup>90</sup> Reporter mandate – Update to variable usage costs, Final report, Halcrow Group, June 2008. This can be accessed on our website at <http://www.rail-reg.gov.uk/upload/pdf/pr08-halcrowvuc-200507.pdf>.

- 19.23 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. There is a material impact on the level of expenditure involved and there is a significant apparent change in the 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.
- 19.24 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 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 place during CP4 to inform future reviews of the variable usage charge.

#### *Applying efficiency*

- 19.25 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.<sup>91</sup> 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.<sup>92</sup> In addition to this, it minimises distortions in inter-modal choices. This approach to charging has been supported by the majority of stakeholders when we have 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 incentivised to accommodate additional traffic (above the levels assumed for the SBP/SBP update). However, we are also providing Network Rail with a revised volume incentive in CP4 which gives it a direct financial benefit for accommodating additional traffic (over the demand levels assumed in the SBP/SBP update). Moreover, this approach to charging should provide Network Rail with an additional spur to improve its efficiency.
- 19.26 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

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<sup>91</sup> See paragraph 4.20 of our June 2006 document.

<sup>92</sup> This is the level that would be expected if Network Rail was at or closer to the efficiency frontier.

level of catch-up efficiency that Network Rail faces is significantly higher than it has proposed. We have therefore adjusted Network Rail's calculation. 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 we have currently estimated for CP5. Table 19.4 shows the total variable usage charge calculated with our efficiency adjustment.

**Table 19.4 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
<b>GB</b>							
Network Rail's proposal	Franchised passenger	153	154	158	159	159	784
	Freight	75	75	76	77	80	382
	Open access passenger (estimate)	14	14	14	14	14	71
Our determination	Franchised passenger	119	120	123	123	124	608
	Freight	58	58	59	60	62	297
	Open access passenger (estimate)	11	11	11	11	11	55
<b>England &amp; Wales</b>							
Network Rail's proposal	Franchised passenger	141	143	146	147	147	724
	Freight	66	66	68	69	71	340
	Open access passenger (estimate)	14	14	14	14	14	71
Our determination	Franchised passenger	110	111	113	114	114	562
	Freight	51	52	52	53	55	264
	Open access passenger (estimate)	11	11	11	11	11	55

<b>Scotland</b>							
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	7	7	7	7	33
	Open access passenger (estimate)	0	0	0	0	0	0

19.27 Open access passenger operators will pay the variable usage charge derived from the same price list as franchised passenger operators. This income level is estimated here because Network Rail has not broken down its open access income to show the variable usage charge alone. We have asked it to provide us with a robust estimate by the end of August 2008 for our final determinations.

*Allocation between vehicles*

19.28 Once the overall efficient level of variable usage cost is identified, it is then allocated between freight and passenger 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. Establishing charges for each vehicle type should ensure not only that Network Rail recovers the costs that each vehicle imposes, but that there are incentives to train operators, funders and suppliers about vehicle usage and design. These characteristics reflect the costs associated with vertical forces and as set out below consideration of costs related to lateral and longitudinal forces will now also be considered. Although we recognise that in many cases the choices available are limited we do know that the structure of charges has had some influences on manufacturers and others in vehicle design, particularly in relation to the design of suspension types for freight vehicles.

19.29 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).

- 19.30 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 an additional term to the charging model in addition to weight, speed and unsprung mass.
- 19.31 Much work has been carried out across the GB rail industry to understand 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.<sup>93</sup>
- 19.32 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.
- 19.33 Network Rail has allocated vehicles to a curving class and a particular cant deficiency to reflect the likely effect when going round curves. This curving class is driven by the vehicles stiffness of suspension (primary yaw stiffness) and the vehicle's mass.
- 19.34 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.

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<sup>93</sup> TTCI report available at:

*Methodology:*

[http://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:*

[http://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)

*Vehicle rates*

19.35 We have set out in a separate document available on our website the proposed vehicle charges (incorporating our view on efficiency). If train operators, manufacturers or others have any remaining concerns related to the vehicle characteristics included as the basis for charges for CP4 (both the existing vertical characteristics or the new characteristics relating to lateral and longitudinal forces), it will be important to highlight them in responses to our draft determinations, with full reasons for the concerns.

*Suspension band discounts and penalties*

19.36 Since the review of freight charging policy 2001 (FCR01), the variable usage charges for freight vehicles have been modified to reflect the suspension or bogie type used by the vehicle. 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 19.5). While this reflected the understanding of track friendly bogie characteristics and has promoted 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. However, sufficient data is now available to establish a more robust and quantified set of discounts for CP4.

**Table 19.5: 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%

19.37 We were disappointed that Network Rail did not include a proposed new set of discounts in its SBP. We asked for this to be included in its SBP update but Network Rail still did not produce this. We are concerned at the lack of concrete progress. As this has not been produced we have said that a full table needs to be published for consultation by Network Rail by the end of July 2008.

19.38 Given that the variable usage charge now reflects costs type from lateral and longitudinal forces, as well as vertical forces, we consider that it is appropriate to take account of these cost effects in the suspension discount rates. However, because of the late stage in the PR08 process, we have asked Network Rail to produce a set of discounts that incorporates the impact of vertical forces only as well as one including lateral and longitudinal forces. This will provide us with flexibility in determining the appropriate values for CP4 in our final determinations. We recognise the long-term investment decisions made on the basis of the suspension bands and will consider how to deal with this (e.g. through phasing in any changes) once we have received Network Rail's proposals.

#### *Route-based costs and charges*

19.39 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.

19.40 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.

19.41 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.

19.42 Table 19.6 shows Network Rail's route based cost estimates, and table 19.7 shows the cost estimates for England & Wales and Scotland.



**Table 19.6 Network Rail's SBP and SBP update route based cost estimates compared (end CP4 efficiency, using Network Rail's efficiency assumptions)**

£ per kgtkm (2006-07 prices)	SBP	SBP update	Difference
<b>System-wide</b>	1.34	1.40	4%
<b>Primary</b>	0.98	0.96	(2%)
<b>L&amp;SE</b>	1.38	1.45	5%
<b>Secondary</b>	2.28	2.36	4%
<b>Freight</b>	1.94	1.98	2%
<b>Rural</b>	4.83	4.04	(16%)

**Table 19.7 Network Rail's SBP and SBP update variable usage cost estimates for England & Wales and Scotland (end CP4 efficiency, using Network Rail's efficiency assumptions)**

£ per kgtkm (2006-07 prices)	England & Wales	Scotland	Network average	Difference Scotland to England & Wales
SBP*	1.71	2.65	1.79	55%
SBP update	1.37	1.64	1.40	20%

Note: \*Our calculation.

19.43 In the light of these revisions to Network Rail's understanding of route based costs between England & Wales and Scotland, we will not now implement separate variable usage charge price lists for CP4. Given that the cost differential is now much less than it was initially it makes the case for introduction insufficiently compelling.

19.44 We will give further consideration to the calculation of route based costs in CP4 alongside further consideration for route base charging. A key consideration when considering route based charges is that the variable costs of primary routes tend to be lower than that of rural routes and other secondary and tertiary routes. Therefore, all other things being equal, route based charges will incentivise the use of primary routes, in particular by freight operators. In giving further consideration to route based charging it is therefore also appropriate to give further consideration to the pros and cons of a scarcity charge (discussed further in chapter 22).

*Coal spillage*

19.45 To take account of the cost impact of spilt coal dust 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.<sup>94</sup> In our caps on 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.<sup>95</sup> 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 recovers 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 from:

- 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.

19.46 In its SBP update Network Rail, based on the reporter's cost estimate, proposed a 16% mark-up on variable charges for vehicles carrying coal. Network Rail retained its proposal for a rebate for customers who can demonstrate that they are undertaking mitigating measures although it did not provide any details of how it intended to implement its proposals.

*Our assessment of Network Rail's proposals*

19.47 Based on the work by the reporter as well as our own review we are content that the reporters estimate of £4.1m per annum represents a reasonable reflection of the costs of coal spillage. We are, however, concerned about the way that Network Rail has treated the cost in that it appears to have been applied, without allowance for future efficiency, to current levels of variable charges.

19.48 Following discussions with the reporters we have identified that the unit costs used to estimate the impact of coal spillage are from 2006-07. Consistent with

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<sup>94</sup> *Review of freight charging policy*, Office of the Rail Regulator, October 2001. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/136-fchargfincon.pdf>.

<sup>95</sup> *Consultation on caps for freight track access charges*, Office of Rail Regulation, December 2006. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/310.pdf>.

our charging policy, this charge should reflect long-term steady state efficient costs. We have therefore adjusted the reporters cost estimates to reflect long-term steady state costs (that is end of CP4 efficiency and further catch-up in CP5). This reduces the Halcrow estimate by 42%. This gives an efficient cost impact of coal spillage of £2.4m per annum.

19.49 EWS has raised a number of concerns on the reporter's costs calculations. The main concerns and the response from the reporter are:<sup>96</sup>

- EWS said that the reporter was not required to confirm whether the points failures were caused by coal spillage. The reporter states that they checked the failures reported and recorded for two areas London North Eastern and Scotland and increased these pro rata to give a national figure;
- EWS said that the reporter did not identify the areas affected by coal spillage. The reporter states that, unlike Network Rail, they do not consider that coal spillage materially affects all infrastructure over which coal traffic flows but have only included a set radius of loading and discharge points based on field observations;
- EWS said that the reporter did not identify whether the action undertaken was necessary and efficient. The reporter states that they found no evidence that unnecessary renewals had taken place; and
- EWS said that the unit costs were based on broad corporate averages. The reporter states that it used track category 3 as an average for coal spillage affected track.

19.50 The costs of coal spillage depend in large part on the volume of coal transported. They are not impacted by the same vehicle characteristics that affect track wear and tear. Following discussions with Network Rail and consideration of the responses by consultees to the SBP, we have determined that the charge should be levied as a 'per gross tonne mile' mark-up on the variable usage charge. Our determination of the coal spillage charge for CP4 is 23 pence per 1000 gross tonne miles for vehicles carrying coal.

19.51 We welcome Network Rail's proposed rebate for customers who take measures to mitigate coal spillage. We are, however, concerned that Network Rail has not yet put forward firm proposals for how the rebate would be assessed and applied. We have asked Network Rail to provide its recommended approach for the rebate, including any associated legal drafting, following industry consultation, as part of its response to our draft determinations by 4 September 2008. We expect to discuss Network Rail's proposal with the industry over this period and ask that any responses to

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<sup>96</sup> *Reporter mandate, coal spillage costs report*, Halcrow, April 2008. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/pr08-halcrowcoal-020608.pdf>.

Network Rail’s consultation be copied to us. We will set out our decision on the company’s proposal in our final determinations.

*Electrification asset usage charge*

19.52 In the current charges a mark-up on the traction electricity charges is used to reflect Network Rail’s maintenance and renewals costs of electrification assets, e.g. overhead lines. In its charges proposal Network Rail has, 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 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.

19.53 The proposed 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.

**Table 19.7: 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
<b>GB</b>						
Franchised passenger	7	7	7	7	7	35
Freight	0	0	0	0	0	0
<b>England &amp; Wales</b>						
Franchised passenger	6	6	6	7	7	33
Freight	0	0	0	0	0	0
<b>Scotland</b>						
Franchised passenger	0.5	0.5	0.5	1	1	3
Freight	0	0	0	0	0	0

19.54 In our assessment we have reviewed the basis behind Network Rail’s cost estimate and consider that the company’s underlying proposal is a reasonable basis for the CP4 charge. For our determination we have applied our long-term efficiency assumption. Table 19.7 shows the expected level of income to Network Rail from the electrification asset usage charge (including our long run efficiency assumption).

19.55 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 basis. This is not included in the current passenger variable usage charge price list. The rates are shown in table 19.8.

**Table 19.8: 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

19.56 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.

19.57 Work has already taken 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 timing and length of purchase 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.

19.58 Table 19.9 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 19.9: Estimated traction electricity charge income for CP4**

£m (2006-07 prices)	2009-10	2010-11	2011-12	2012-13	2013-14	Total
<b>GB</b>						
Franchised passenger	132	134	139	145	149	699
Freight	4	5	5	6	6	26
<b>England &amp; Wales</b>						
Franchised passenger	124	126	131	136	139	656
Freight	4	4	5	5	5	23
<b>Scotland</b>						
Franchised passenger	8	8	8	9	9	43
Freight	0	0	0	1	1	2

### *Price*

19.59 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.

19.60 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 time of year and time of day (though without including the recent and perceived transitory increases between the SBP and SBP update). The price list is published in a separate document on our website.

19.61 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 1999-2000 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.<sup>97</sup> On this basis, and without an obvious alternative available, we are content for freight train operators to continue to pay for electricity on this basis in CP4. However, Network Rail will rebase the starting payments to reflect its current estimate of costs for the start of CP4 using the price matrix described above.

### *Consumption*

19.62 Ideally each train operator's electricity consumption would be calculated through an on-train meter and there would be no need to estimate electricity use (other than perhaps to determine the appropriate share of any electricity system losses).<sup>98</sup> Many in the industry are working hard to make this happen and we encourage this so as to exploit the benefits of accurate traction electricity billing and because on-train meters would encourage energy efficient driving policy. We intend the traction electricity charging regime to work for operators with on-train metering from the start of CP4 if required. We will therefore review the legal drafting necessary for this in our July consultation and will work with the industry to deal with necessary security levels and treatment of system losses. However, we recognise that in the foreseeable future, this will not be possible for all vehicles.

19.63 Therefore 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 continue. Improvements need to be made to the modelled vehicle consumption rates (and the associated processes), which form the basis for current traction electricity charging.

19.64 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 arrangements that have been in the regime from the start adjusts each train operators' traction electricity charge for the difference between the total modelled electricity consumption in that region and the actual total electricity consumption in that region, on the basis of their relative share of total modelled consumption, in order that Network Rail can recover all of its traction

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<sup>97</sup> *Consultation on the sourcing of industrial energy pricing data in the Quarterly Energy Prices publication*, Department for Business, Enterprise and Regulatory Reform, May 2009. This may be accessed at <http://www.berr.gov.uk/consultations/page14043.html>.

<sup>98</sup> 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.

electricity costs. Since the agreed change to the basis for price in the charge for franchised passenger operators, there has been an additional adjustment for the difference between expected costs and actual costs to Network Rail (so that it is protected from variation in costs from the expected level).

19.65 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.

19.66 As part of its charges proposal, Network Rail has committed to develop a new model to produce consumption rates for use in estimating the consumption of particular vehicles and vehicle/route combinations where on-train metering is not available (which we recognise will still be so in the vast majority of cases, at least at the start of CP4). It proposes 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 and the work is still ongoing to develop a new model. We are disappointed that Network Rail was unable to produce revised consumption rates in its SBP update. However, initial results are available and Network Rail is currently involving train operators, through ATOC, to discuss the emerging findings of the model. We will also expect to see full consultation, including with manufacturers and rolling stock leasing companies (ROSCOs) by no later than the end of July 2008. We need to receive the finalised proposed rates and consultees views by the end of August 2008.

19.67 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. This was because of the variations in the wash-up. 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 have 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.



- 19.68 While 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. If freight operators have to pay the wash-up they will face cashflow uncertainty through the wash-up 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.
- 19.69 We consider that it is appropriate to include freight operators (and if applicable open access passenger operators) within the wash-up adjustment. We will give further consideration to how the cash flow risk to freight operators can be managed in this process and discuss it further with the operators and Network Rail before our final determinations. This will be covered in our draft Schedule 7 (charging schedule) due to be published in July 2008.
- 19.70 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 timetable as its correction does not require changes to track access contracts. This could 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 from 1 April 2009 reflect more accurately the actual consumption rates.

*Regenerative braking and on-train metering*

- 19.71 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 environmental performance and reducing Network Rail's costs. In CP2 and CP3 we have provided for a potential discount to a small minority of rail vehicles 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.
- 19.72 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 19.10.

**Table 19.10: 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.

19.73 These results are consistent with the work we commissioned in the SOCC review 2005. Consultation responses were generally supportive with no responses suggesting fault with the proposed rates.

19.74 The greater accuracy of these discounts will significantly reduce the risk of the application of this discount affecting other train operators’ bills through the wash up as the actual consumption saving and the modelled consumption saving should be more closely aligned. However, in reviewing the detailed Schedule 7 drafting which we are consulting on in July 2008, we will need to make sure that this discount is properly effective in the light of both the wash-up adjustment for the difference between modelled and actual electricity consumption and the difference between Network Rail’s expected and actual costs. This should also be assisted by the wash-up being applied for the 22 new traction electricity regions.

19.75 Throughout PR08 we have supported the use of on-train metering as the best long term solution to providing accurate consumption measures as part of the traction electricity charge as well as providing real incentives for energy efficient driving which we understand from European comparators could produce significant savings in energy use (as much as 40% in Germany and the Nordic countries).

19.76 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;
- used all the time (with estimated consumption rates used if there are gaps in the data collection); and
- how system electricity losses are allocated.

19.77 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 welcome the views of train operators, ROSCOs and manufacturers on the issues set out above. Where a train operator has an on-train meter, we would expect its charge to be based on the metered consumption. However, a fixed proportion of the average wash-up for the region would continue to be payable to cover the train operators' share of system losses.

## Capacity charges

19.78 The capacity charge was introduced as part of 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 FCR01. 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.

19.79 The costs the capacity charge reflects are costs through the Schedule 8 performance regime. They 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 other train services differs.

19.80 Since PR2000, the charge has not been able to be billed to reflect these different costs by region and timeband. 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.

19.81 Network Rail's initial 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 being 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 its consultation on the SBP a number of fundamental issues were raised 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;
- appropriate impact of the performance regime benchmark recalibrations for CP4 on the level of capacity charge; and
- likely incentive effects of the proposed charge and the change in circumstances between early CP2 (when the charge was introduced) and the start of CP4.

19.82 In response to this Network Rail carried out extensive work to understand the relationship between the capacity charge and the Schedule 8 performance regimes for passenger and freight operators. Network Rail recognise that these anomalies can be only partially remedied in CP4 and that they will need to be revisited before the next periodic review. It also recognised in its SBP update proposal that these anomalies support an argument for retaining the more simplified current arrangements for the charge.

19.83 Through changes to the Schedule 8 performance regime, we will limit the anomalies identified in the interaction with the capacity charge for CP4. In particular by adjusting the freight performance regime so that freight operators payments to Network Rail reflect other operators' growth on the network. We consider that it would be wrong to abolish the capacity charge given that a significant cost remains which would not otherwise be recovered. Specific improvements to Schedule 8 are discussed in chapter 25 and will be finalised with the final Schedules in July 2008. We will work with Network Rail and industry partners over CP4 to review the remaining outstanding issues.

19.84 Our determination on the capacity charge for CP4 is that it should:

- reflect the impact of the recalibration of Schedule 8 (generally expected to reduce the rates because as the benchmarks are reduced the marginal congestion cost decreases) 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 the difference between these and

the up to date relationship should be an early part of the review in this area during the early part of CP4); and

- to facilitate as far as possible operators or their funders adding new services at appropriate cost levels by the use of the weekend discounts and the possible re-definition of service groups, e.g. to reflect purely PTE and services supported by others e.g. Transport for Wales.

19.85 The remaining unknown in the calculation of the list of capacity charge rates for CP4 is the final Schedule 8 benchmarks following the recalibration work described further in chapter 25. Once this is completed in July 2008, Network Rail will produce an updated list of rates for industry consultation. The current income projections for the capacity charge over CP4 are shown in table 19.11 but are subject to reduction following the change in Schedule 8 benchmarks.

**Table 19.11: Expected CP4 capacity charge income\***

£m (2006-07 prices)	2009-10	2010-11	2011-12	2012-13	2013-14	Total
<b>GB</b>						
Franchised passenger	148	149	151	152	152	752
Freight	4	4	4	4	4	21
<b>England &amp; Wales</b>						
Franchised passenger	144	145	146	147	148	729
Freight	4	4	4	4	4	19
<b>Scotland</b>						
Franchised passenger	3	3	4	4	4	18
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

19.86 The current structure of freight track access charges was established in FCR01.<sup>99</sup> Under these arrangements freight operators pay a range of variable

<sup>99</sup> *Review of freight charging policy: final conclusions*, Office of the Rail Regulator, October 2001. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/136-fchargfincon.pdf>.

charges but do not currently contribute to fixed costs (costs that do not vary with small changes in traffic) or common (shared) costs.

19.87 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".<sup>100</sup> 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 only lines, coal for the electricity supply industry (ESI coal) and spent nuclear fuel.<sup>101</sup>

#### *Network Rail's proposals*

19.88 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.<sup>102</sup> 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.

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<sup>100</sup> *The Future of Rail*, Department for Transport, July 2004, Cm 6233. This may be accessed at <http://www.dft.gov.uk/about/strategy/whitepapers/rail/thefutureofrailwhitepapercm6233>.

<sup>101</sup> *Advice to ministers and framework for setting access charges*, Office of Rail Regulation, February 2007. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/316.pdf>.

<sup>102</sup> 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 <http://www.rail-reg.gov.uk/upload/pdf/fol-conclusions.pdf>.

**Table 19.12: Network Rail’s freight only line charge proposals**

2006-07 prices and Network Rail’s view of end of CP4 efficiency	2009-10	2010-11	2011-12	2012-13	2013-14
<b>ESI coal</b>					
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	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
<b>Spent nuclear fuel</b>					
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	0.3	0.6	0.8	0.81	0.81
Spent nuclear fuel mark-up £m per 1000 gross tonne miles	1.182	2.365	3.153	3.192	3.192

19.89 We welcome Network Rail’s proposals, in particular they reflect 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.

19.90 We have reviewed Network Rail’s list of freight only lines. We are satisfied with the list but consider that two additional lines should be added to this list:

- the existing freight only line between Charlestown Junction and Kinkardine; and
- the new freight only line between Alloa and Kinkardine.

19.91 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 increases ESI coal freight only line costs by £0.57m.

19.92 We have reviewed Network Rail’s freight only line cost calculations that underpin the above charges. Network Rail has identified an error in the calculation of signalling costs for the Drax line. Removing this error would reduce ESI coal freight only line charges by £0.11m. The combined effect would be to increase ESI coal freight only line costs by £0.46m to £5.04m.

19.93 Network Rail has 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 have 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 19.2. The largest reduction is in signalling and civils expenditure, with only a small reduction in track maintenance and renewal costs.

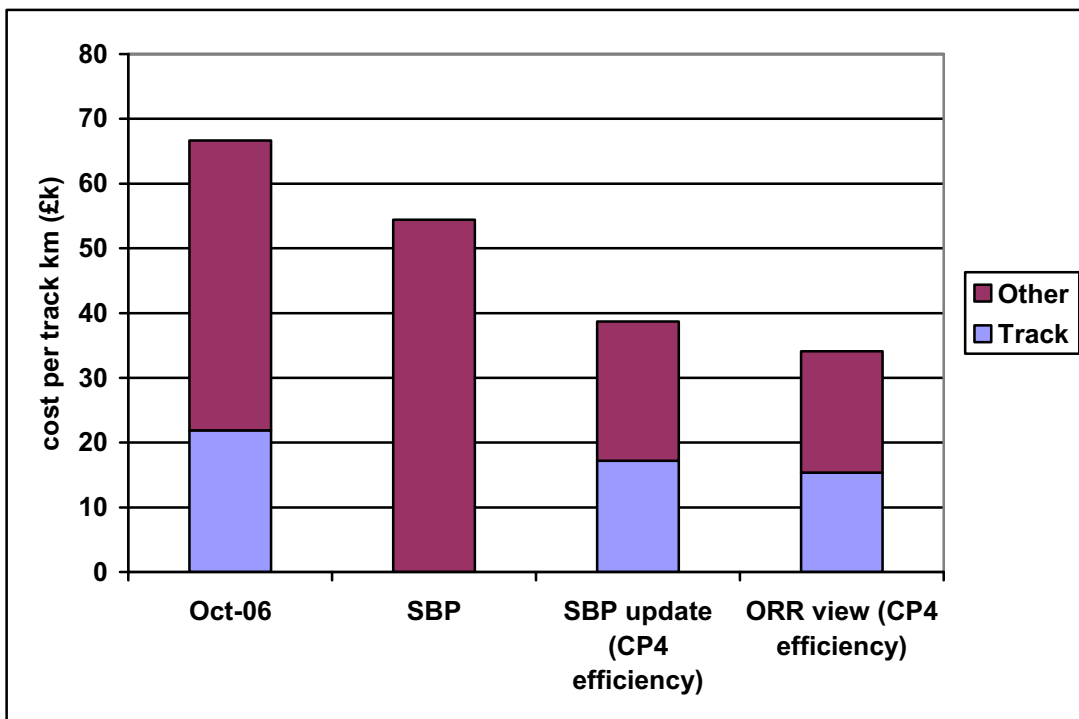


Figure 19.2: Freight only line cost estimates

*Our determinations*

19.94 We consider that overall, and after overlaying our own efficiency assumptions, Network Rail’s freight only line cost estimates are a reasonable basis for setting charges. By the end of CP4 we expect 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 reduces 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, with charging phased in line with the caps as shown in table 19.13.

**Table 19.13: Our determinations 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
<b>ESI coal</b>					
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)	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
<b>Spent nuclear fuel</b>					
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)	0.3	0.6	0.73	0.73	0.73
Spent nuclear fuel mark-up (£ per 1000 gross tonne miles)	1.182	2.365	2.860	2.860	2.860

## Summary and comparison of variable charges

19.95 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 variable 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, though this is disregarded for a comparison of the change in charges. The actual impact will vary between vehicle types. The separate document published on our website sets out the price lists consistent with our draft determinations.

**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
<b>Sub-total</b>	<b>408</b>	<b>261</b>
Capacity charge	7	149
<b>Total</b>	<b>415</b>	<b>410</b>

19.96 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. The separate document published on our website sets out the price lists consistent with our draft determinations.

**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)	0	5.3
<b>Total</b>	<b>113</b>	<b>73.7</b>

19.97 Table 19.16 compares the variable usage charges for a number of typical vehicles. Passenger charges are in pence per vehicle mile while freight charges are in pounds per thousand gross tonne miles. The separate document published on our website sets out the price lists consistent with our draft determinations.

**Table 19.16: Illustrative vehicle rates\***

Vehicle class	Vehicle type	Current Tariff (CP3)	Network Rail proposed tariff (CP4)	Our determined tariff (CP4)
<b>Passenger</b>				
Class 390/M	Elec MU	29.90	19.02	17.04
Mark 3	coach	12.11	8.85	7.93
091/0	Loco	68.64	54.85	49.14
Mark 4	coach	20.83	16.07	14.40
Class 150/M	Dies MU	9.30	6.76	6.06
Class 158/M	Dies MU	12.13	8.21	7.35
<b>Freight</b>				
Class 47/0	General merchandise	3.66	2.87	2.57
Class 66/0	Coal ESI	4.25	2.53	2.26
Class 66/0	Coal Other	3.75	2.61	2.33
Class 86/6	Coal ESI	4.40	4.33	3.88
Class 90/0	General Merchandise	4.08	4.61	4.13
Class 92/0	Coal ESI	3.08	1.85	1.66

Note: \*Passenger charges are in pence per vehicle mile while freight charges are in pounds per thousand gross tonne miles.

## Fixed track access charge

19.98 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 usage charges, the station long term charge, network grants and the other single till income. The fixed charge is only paid by franchised passenger operators.

19.99 Whilst the principal purpose of the fixed charges is to allow Network Rail to recover its full expected revenue requirement. 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, as far as possible, costs should be recovered from those that cause them. Currently, some specific enhancement costs are allocated directly to operators but most are allocated on the basis of timetabled vehicle miles. Out of these, most 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).

- 19.100 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 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.
- 19.101 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 using each of the 307 sections on the basis of timetabled vehicle miles. Although many cost categories 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%.
- 19.102 We have reviewed Network Rail's proposals. We welcome the improvements that Network Rail has proposed and consider that it is a reasonable basis for allocating the fixed charge in CP4. Our separate published document on charges includes the proposed schedule of fixed charges adjusted for our efficiency assumptions and for the level of network grant that we are allowing government to pay to Network Rail in CP4 (which is discussed in chapter 20).

## Next steps

- 19.103 As indicated by figure 19.1, after we have published our final determinations, Network Rail will need to update its individual charges and price lists, to take into account any change in efficiency or other aspects of our final determinations which may impact on its individual access charges. Following this, we will carry out an audit of the charges/price lists and confirm the final charges/price lists before we publish our access charges review notice.
- 19.104 We have also been working with Network Rail to review Schedule 7 of the access contracts, which is the part of the track access contracts where the revised track access charges would be implemented. We will publish a draft of the revised drafting of Schedule 7 in July 2008. It will be first and foremost the responsibility of the parties to the track access and station access contracts to make sure that the determinations are reflected in a way that will be effective when implemented in December 2008. This will include highlighting bespoke

changes needed because of different formats or bespoke provisions in your current contracts. As set out in chapter 29 (on implementation of PR08), we intend to publish the review notice with the changes to Schedule 7 and the new price lists on 18 December 2008.



## 20. Network grant

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### 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.<sup>103</sup> 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.

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<sup>103</sup> *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 <http://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.<sup>104</sup>
- 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.<sup>105</sup>
- 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 determinations.
- 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 determinations 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, our intention is to retain the grant dilution provision in track access contracts for CP4.

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<sup>104</sup> 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.

<sup>105</sup> *Periodic Review 2008: Financial issues update and further consultation*, Office of Rail Regulation, 6 September 2007. This may be accessed at <http://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 determinations, 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.

**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	3,039	3,055	3,099	2,932	2,756	14,881
Scotland	355	358	338	232	193	1,476

20.12 The grant levels are 57% of Network Rail's gross revenue requirement in England & Wales, and 49% in Scotland.

20.13 Although the grant payments will 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.

20.14 Further detail on our calculations of the network grant is provided in annex E.

## Deed of grant

20.15 Between draft and final determinations we expect government and Network Rail to agree a form of deed of grant for us to consider.



## 21. Station long term charge

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### Introduction

- 21.1 This chapter contains our determination for the station long term charge in CP4. Station long term charges are payable by franchised passenger operators and open access passenger operators who call at stations.
- 21.2 The draft list of new station long term charges based on the methodology described in this chapter is published in an accompanying document on our website.

### 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.<sup>106</sup> 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.<sup>107</sup> 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.<sup>108</sup> However, we decided not to make changes to the station long term charges at that time and instead we deferred such changes to PR08.
- 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

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<sup>106</sup> 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.

<sup>107</sup> The initial liability falls on the SFO at non-Network Rail managed stations.

<sup>108</sup> *The structure of station long term charges*, Office of Rail Regulation, April 2005. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/231.pdf>.

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 across a portfolio 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<sup>109</sup> through portfolio level charges, included as part of the fixed charge in track access contracts.

## Our determination

21.7 We have reviewed carefully 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 have discussed with stakeholders, including ATOC, train operators and actual and potential investors at stations. Network Rail's station long term charge proposals are assessed against our charging objectives (set out in chapter 19).

21.8 We support 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 will build on the collaborative approach that we have seen to 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).

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<sup>109</sup> An SFO is a station facility owner, this is the train operator who manages the station and is normally the main user of the station. It pays the station long term charge and then recovers contributions from others proportionate to number of departures.

- 21.10 We do not consider that abolishing the station long term charge and recovering stations expenditure through track access charges is necessary to support the move to portfolio based expenditure planning and achieve the benefits described above. We therefore have determined 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 will add to the total portfolio expenditure. There will be no capital value recovered through the station long-term charge.
- 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 cost proposals is the company’s infrastructure cost model and they have been used by Network Rail to derive the expenditure projections at the portfolio level. We consider these calculations to be reasonable (further detail on our assessment of operational property is set out in chapter 5).
- 21.13 As set out in chapter 4, our determination on station charges and our support for the move towards portfolio based expenditure planning does not in any way reduce Network Rail’s need to maintain average condition across each category of station.
- 21.14 Table 21.1 sets out the expected income from station long term charges in CP4.

**Table 21.2: 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
GB	134	129	125	121	119	629
England & Wales	120	116	112	109	107	565
Scotland	14	13	13	12	12	64

Network Rail has told us that it is continuing to carry out surveys on further stations to update its expenditure estimates. It says that this may lead to changes on the balance of expenditure between portfolios but will not alter the overall level of expenditure. We are disappointed that Network Rail was not able to complete this work and include it with either its SBP or SBP update. However, if Network Rail submits to us material new evidence that the level of charges should be re-balanced by the end of August, following consultation with the industry we will consider the changes for our final determinations.



## 22. Other charging issues

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### Introduction

22.1 This chapter addresses a range of other charging issues that have not been covered in chapters 19 - 21. The chapter addresses:

- dealing with PTE sponsored increments/decrements to train services;
- new charges considered for CP4 but not being implemented;
- change of law provisions;
- Network Rail's billing system; and
- next steps.

### The impact on Network Rail's costs of PTE sponsored increments/decrements of 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.<sup>110</sup>

22.3 This applies to English passenger transport executives (PTEs) and Transport for London (although in theory the principles could apply more widely).<sup>111</sup> 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.

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<sup>110</sup> *The Future of Rail*, Department for Transport, July 2004, Cm 6233. This may be accessed at <http://www.dft.gov.uk/about/strategy/whitepapers/rail/thefutureofrailwhitepapercm6233>.

<sup>111</sup> It might potentially be applicable to other local authorities in England & Wales or Scotland at some point in the future.

- 22.5 Our investment framework already sets out the basis for funding around increments in train services so the work in PR08 has focused on the likely cost savings to Network Rail from PTE/TfL sponsored decrements. The issues being:
- identifying where material cost savings are likely to be available if the decrement takes place;
  - identifying where material cost savings are unlikely to be available if the decrement 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 them as effective as possible while minimising transaction costs; and
  - facilitating the transfer of funds where PTE/TfL sponsored decrements do cause material savings in Network Rail's costs.
- 22.6 While an upfront method for allocating Network Rail's costs in response to PTE/TfL sponsored changes 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 focused on identifying where material savings are and are not likely to be achieved through decrements of train services. The principles identified were:
- material savings are likely where Network Rail will, as a result of the decrement, 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 decrement 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 PTE supported 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 decrement). This is similar to the way PTEs/TfL support services using the track access contracts.

### **New charges for CP4**

- 22.12 Earlier in PR08 we consulted on scarcity charges, reservation charges and environmental charges. We stated at the outset that we had no plans to implement either a scarcity charge or environmental charge for CP4, 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 we would not introduce a reservation charge in CP4. We have said that we will review the potential for these charges again during CP4 for possible implementation in CP5. More detail on our work and decision on a reservation is provided in our update on the framework for setting outputs and access charges in February 2008.

### **Change of law provisions**

- 22.13 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 of the most recent periodic review) and where we determine that these should be borne by the operator instead of Network Rail.
- 22.14 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 were no longer necessary as Network Rail could bear the uncertainty within the other protections provided through our determinations. 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 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.

- 22.15 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. We therefore consider that the change of law provisions should be removed.

## **Billing system**

- 22.16 In parallel with preparing its charges proposal Network Rail has been upgrading its billing systems. One of the main objectives behind this work is to support the CP4 charges (as well as being able to deal with future changes to charges). Network Rail has kept us informed of progress on this and in the Summer we will be working with it to 'shadow run' the charging proposals to make sure that the PR08 determinations can be implemented properly from 1 April 2009.

## **Next steps**

- 22.17 Some of the work necessary to be able to determine all of the access charges for CP4 still needs to be completed by Network Rail.
- 22.18 In completing this outstanding work it is important that all stakeholders have the opportunity to review and comment on these elements in addition to the ones set out in the accompanying charges document.
- 22.19 By the end of July we expect Network Rail to have published its consultation on the remaining elements of its CP4 charges proposals:
- suspension type banding, table of discounts
  - traction electricity charge, proposed consumption rates model and rates;
  - capacity charge, list of rates; and
  - station charges, detail of how joint groups will work to influence decisions on station expenditure across franchisee portfolio of stations.

## Looking ahead to CP5

22.20 We consider that the CP4 access charges decisions mark an incremental, but nevertheless important, improvement in the overall structure of charges. For example:

- the greater robustness in estimating the variable usage charges;
- inclusion of the 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.

22.21 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.

22.22 By the time we come to undertake the next periodic review (which we expect to reach draft and final determinations during 2013) we would expect significant further development of the ICM. We will work with Network Rail to ensure that the development of the model proceeds appropriately.



## 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, and accordingly this 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	942
Property sales	26	25	34	18	24	127
Depots	46	46	46	46	46	230
Other	2	2	2	2	2	10
<b>Total non charge related income</b>	<b>264</b>	<b>261</b>	<b>269</b>	<b>283</b>	<b>291</b>	<b>1,309</b>

Rounded to the nearest million.

23.3 We have reviewed the assumptions behind Network Rail's forecasts and the level of those forecasts compared to their recent level and trend.

23.4 Network Rail's property forecasts and the methodology underlying them were reviewed by its own consultants, Lambert Smith Hampton. We asked DTZ Piedad 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.

23.5 The SBP and the supporting documents covering property income were considerably more detailed and clear than the documentation supplied with the ISBP, and made this process of review and challenge relatively straightforward.

## Our conclusions

### *Property income in the SBP*

- 23.6 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 significant 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" index<sup>112</sup>) by 0.5% per annum, which DTZ Pineda said appeared modest.
- 23.7 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 revenue requirement.

### *SBP update*

- 23.8 In response to the concerns we expressed in our assessment Network Rail updated its SBP and provided us with a confidential document justifying retail income growth assumptions.
- 23.9 In this document Network Rail has gone some way to justify its projections of forecast growth in retail income, through presenting the historic level of passenger number and sales growth and outlining the other factors considered in forecasting rental income.
- 23.10 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. While this letter gives more detail as to the nature and timing of the proposed developments, the substance of Network Rail's argument has not changed. It argues 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.
- 23.11 Our view is that this risk, in terms of the sums involved and level of uncertainty, is manageable within the overall settlement. There is also the possibility that the value achieved in negotiation exceeds the SBP forecast, and it is important that the incentive to realise the value of these stations developments early is retained.

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<sup>112</sup> The IPD index is an industry-standard yardstick of property investment performance.

- 23.12 We also consider that the risk associated with the delivery of the Euston and Victoria development benefits is offset by the possible conservatism in the rental income forecast.

*Treatment of property income in revenue requirement calculation*

- 23.13 The SBP and April 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'). That is where Network Rail would take an enhanced asset from a developer in lieu of cash. For example, in exchange for land to develop commercial premises, a developer might enhance the station by installing lifts at a station.
- 23.14 The regulatory treatment of hypothecated gains in PR08 is important because the decision to take significant benefits in the form of hypothecated gains instead of cash reduces other single till income significantly in CP4 (and so increases Network Rail's net revenue requirement recovered through access charges).
- 23.15 Prior to the implementation of the hypothecated gains policy, Network Rail was incentivised to take cash rather than (more valuable) assets in exchange for land, since there was no income stream associated with the new asset. Our policy of allowing RAB additions for the hypothecated gain was intended to address this bias.
- 23.16 However, the policy introduces a possibility of over funding in the treatment of hypothecated gains, since in the SBP the value of the gain does not count as income in the single till calculation and Network Rail would receive income from any RAB addition associated with the enhancement. It would therefore benefit twice if we were to add forecast hypothecated gains to the RAB.
- 23.17 We have considered whether to count 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.
- 23.18 Network Rail has said that the benefits forecast in the form of hypothecated gains could not be substituted with cash, and we have asked it to evidence this further. Subject to this case being made convincingly we will allow the hypothecated gains, without RAB addition, up to the value forecast in the plan (that is up to £296m over CP4), and we will treat the benefits due to hypothecated gains as they are treated in Network Rail's submissions. That is, their value will not count towards single till income and so would not reduce the amount recovered by access charges in funding Network Rail's gross revenue requirement. The RAB addition for any hypothecated gains beyond the SBP forecast will be considered on a case-by-case basis in CP4, according to our published policy.

*Depots and other income*

23.19 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.

23.20 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 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 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. If there is any more clarity before we make our final determinations then we will make an adjustment to the depots income assumption as necessary.

23.21 Network Rail also receives a small amount of other income from various other sources (for instance providing litter clearance at stations). We have assumed that Network Rail's forecast of stable levels through CP4 is reasonable.

*Summary*

23.22 Table 23.2 summarises our assessment of projected other single till income in CP4.

**Table 23.2: 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	190	188	187	190	187	942
Property sales	26	25	34	45	56	186
Depots	46	46	46	46	46	230
Other	2	2	2	2	2	10
<b>Total income</b>	<b>264</b>	<b>261</b>	<b>269</b>	<b>283</b>	<b>291</b>	<b>1,368</b>

Rounded to the nearest million.



# **PART E: CONTRACTUAL AND FINANCIAL INCENTIVES**



## 24. Contractual and financial incentives

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### 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.<sup>113</sup> 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 these determinations.
- 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 determinations 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;

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<sup>113</sup> *Periodic Review 2008: Enhancing Incentives for Continuous Improvements in Performance*, Office of Rail Regulation, July 2006. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/298.pdf>.

- achievement and outperformance of outputs and financial targets benefits management through bonuses received under the management incentive plan; and
- 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 determinations 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 determinations 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 determinations 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

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### Introduction

25.1 This chapter sets out changes that we are proposing to make to schedule 8 – the performance regime – of passenger and freight 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 train operator payment rates. More significant changes are being proposed for the freight performance regimes in order to simplify them and to ensure a consistent approach across all freight operators, including standardised benchmarks and payment rates applicable to all freight train operators and normalised for traffic growth.

### Background

- 25.2 Since privatisation, with vertical separation between infrastructure management and train operations, it has been important to align the interests of the infrastructure manager with the train operators in relation to seeking to minimise lateness and cancellation. 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 revenues. Freight operators are concerned about the performance of their services because of the costs incurred e.g. additional crewing costs and because of the impact (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.

## Changes to the passenger performance regime

### *Introduction*

- 25.5 The changes that we are proposing to make to the passenger performance regime have been informed by the work of an industry group<sup>114</sup> and the responses to a wider industry consultation in April 2007<sup>115</sup> 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 based on the recommendations of the industry group, which are detailed below. The changes are aimed at:
- ensuring that benchmark levels of performance are consistent with the overall improvements in performance required in CP4;
  - ensuring that the payments made by train operators when they delay other train operators, reflect as accurately as possible the effects on revenue;
  - ensuring that the threshold at which sustained poor performance is defined is more realistic; and
  - improving the process by which changes can be made to schedule 8 during a control period when certain conditions have been met.

### *Network Rail benchmark*

- 25.8 The performance regime is a benchmarked regime. That is, they allow 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 realistically achievable but challenging level. Where both Network Rail and train operators perform at their respective benchmark levels no payments are made.

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<sup>114</sup> Attendees of the group represent Network Rail, train operators, ATOC, DfT and Transport Scotland.

<sup>115</sup> *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>.

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
- reduced year on year in CP4 reflecting Network Rail's improvement trajectory.

*Train operator benchmark*

25.10 The train operator benchmark is also set (normally at a periodic review) at a realistically 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 and adjusted for the remaining period up to the start of CP4, but 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 have on the latter's train service performance. It is set to reflect the likely impact of one train operator on others, the likely cost of that impact to Network Rail when paying compensation to other operators, including coverage for any 'passenger charter' compensation that the affected train operator pays to end customers.

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. The train operator payment rate includes an element that provides for compensation to other train operators in relation to these passenger charter provisions.

*Sustained poor performance (SPP) threshold*

25.14 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.

25.15 The threshold levels for CP3 were set as 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

25.16 Despite the reduction in extent of the threshold, actual Network Rail performance for each TOC has been significantly better than this level. While we welcome this, we remain concerned about the lack of evidence for the point that the threshold should be set. It 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.

25.17 In line with the industry group's recommendation, we are revising the level of the threshold for CP4 so that it is equivalent to the worst 1% of Network Rail's actual performance (at train operator level) since the introduction of the threshold but then adjusted for the change in Network Rail benchmarks. We will include the specific numbers implied by this when sharing the revised draft performance regimes with franchised passenger train operators in July 2008. While this might make it more likely for the threshold to be breached, this does not guarantee 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*

25.18 We also reviewed the expert determination provisions provided for 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.

25.19 We will make the following changes so that the provisions are more effective:



- clarify additional detail about the initial proposal from the train operator to Network Rail, that it should include sufficient supporting information etc.;
- 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.

25.20 The industry group also considered whether ORR should undertake the expert role in some or all paragraph 17 cases. We are still considering how best to reflect this last detail in legal drafting and will consult on this with the Schedules 4, 7 and 8 in July 2008.

#### *Recalibration of the regime*

25.21 The technical re-calibration work will propose changes to the Network Rail benchmarks, train operator benchmarks, and train operator payment rates for CP4, reflecting the changes described above. We have commissioned consultants to undertake the technical work and this will be managed and funded jointly by Network Rail, ATOC and us. This work runs from May to July 2008. Franchised passenger train operators will receive details of the consultant's proposal in the next week. We will then send details of the input data that the consultants intend to use. Finally in mid July 2008 there will be a full consultation with franchised passenger train operators on the final numbers.

25.22 In setting the outputs for this consultancy work we recognise that many train operators were concerned at the effect of not reflecting significant changes, expected to be made to the timetable in December 2008. Any recalibration exercise will inevitably not be able to reflect changes that take place after the work needs to be completed. In some 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 to facilitate such cases in this review by:

- being transparent with train operators and Network Rail as to the assumptions of the recalibration work;
- requiring the recalibration modelling to be more flexible than previously in terms of supporting changes and ensuring that Network Rail have full access to the model so as to be able to reflect changes in it 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.

25.23 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.

25.24 As there was not unanimity among train operators that these should be part of the work and that we should appraise the costs and benefits once we understood the cost we decided after discussing with ATOC that we would not go ahead with this part in the review. 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.

25.25 Legal drafting reflecting the above will be consulted on with other contractual changes in July 2008.

## Changes to the freight performance regime

### *Introduction*

25.26 An industry group has 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 are more fundamental than the changes being made to the passenger operators' regime.

25.27 The proposed changes are aimed at:

- standardising the regime between freight operators so as to remove any competitive advantage for any operators from the structure of the regime resulting from the timing of negotiating the regime or negotiating power;
- simplifying the regime as far as possible; and
- setting the level of compensation to reflect better the average impact on freight operators' costs and revenue loss. While the industry group developed the scope (which involved representation from all freight operators) we consulted formally on the proposed changes in August 2007.<sup>116</sup>

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<sup>116</sup> *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](http://www.rail-reg.gov.uk/upload/pdf/pr08-fgt_perfreq_rev_let_310807.pdf).

### *Network Rail benchmark*

- 25.28 This element of the freight regime carries out the same function as above for the passenger regime.
- 25.29 We have determined 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 regimes at present. This benchmark level will also be updated to be realistic but challenging in CP4. The benchmark level would be a normalised amount of minutes delay per 100 train kilometres.
- 25.30 The final number will be based on Network Rail's performance in the recalibration period December 2005 – December 2007 plus appropriate adjustment to get to April 2009 and with Network Rail's improvement trajectory (based on the numbers in Appendix 14 of its SBP update). Although we have not published the final number here we have been discussing these with members of the industry group individually, particularly to understand the impact on freight train operators compared to the current regime. In the light of these meetings we are considering a number of further adjustments identified below. The final approach will be consulted on in July 2008 with the freight schedule 8s.

### *Network Rail payment rate*

- 25.31 The Network Rail payment rate will be set common across all freight operators reflecting the industry's best estimate of the average impact on freight operators of lateness and cancellations. The numbers will be provided with the draft Schedule 8 in July 2008.

### *Freight operator benchmark*

- 25.32 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 as applied to passenger operators.
- 25.33 An additional change will be the normalisation of the regime for other train operators' growth in services. This is needed so as to reduce the partial double recovery by Network Rail through the freight performance regimes (where the actual impact on other operators' services drives freight operator payments) and the capacity charge paid by the new services running.

### *Freight operator payment rate*

- 25.34 The freight operator payment rate will be common across all freight operators based on the average estimated impact on other train operators.

### *Cancellation arrangements*

25.35 Enhanced compensation arrangements will be introduced in respect of cancellations but also with the introduction of a cancellations benchmark to replace the need for an additional access charge supplement to fund Network Rail for this change to the regime:

- performance better than benchmark = £1,500 per cancellation compensation from Network Rail to the affected freight operators;
- the details of the benchmark will be set out in July 2008 when the revised schedule 8 is consulted upon; and
- performance worse than benchmark = £4,000 per cancellation paid by Network Rail to the affected train operators.

### *Access charge supplement (ACS) to pay for a cap on liabilities for each individual performance incident*

25.36 Freight operators generally have an incident cap. This caps their liabilities for performance failures resulting from a single incident. The freight operators pay Network Rail an access charge supplement (ACS) to fund it for the risk it places on the company, i.e. that a liability to a third party operator is payable but the incoming payment from the freight operator is limited to the incident cap. This ACS is currently based on an analysis of several years' data and the likelihood of a freight operator breaching a particular incident cap level and a contingency to cover for events not witnessed in the period covered by the data (20%). We have been trying to establish with the working group what level this contingency should be. Given that Network Rail has more than twice the data it had when establishing the incident cap ACS, we have decided that the incident cap ACS should be reduced at all levels to reflect a lower Network Rail contingency element of 10% rather than 20%.

### *Annual cap on performance regime liabilities*

25.37 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

25.38 We also reviewed proposals to increase the level of compensation to freight train operators for long delays. The logic behind such a change was similar to that for the enhanced cancellation arrangements, i.e. that long delays can have a disproportionate impact on freight operators costs and in some cases revenues. They were a key concern recognised by the industry group.

25.39 We have decided not to make changes to introduce enhanced compensation for long delays. This is because this change would involve introducing greater complexity to the regime (rather than the general aim of simplifying it where

possible) and it was also not possible using current data to distinguish between long delays from other delays given Network Rail's current systems.



## 26. Schedule 4 – possessions regime

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### Introduction

26.1 This chapter sets out our determination on changes that we propose to make 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 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.

### 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 has become apparent from discussions with Network Rail and train operators that the current compensation regimes for possessions are 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 possessions. In response to our request the industry has 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 – on the understanding that a revised schedule 4 regime for freight will also be introduced). Further recommendations for changes to freight operators' schedule 4 are expected in July and we therefore recognise that this may further impact on the drafting of Part G – which will be published as part of the freight consultation in July.

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).<sup>117</sup> We now set out our determination on these issues. First we set out the current arrangements for possessions compensation and the key elements of the industry's proposals.

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<sup>117</sup> *Periodic Review 2008: Train Operator Compensation from Possessions – consultation on changes to the compensation regime for passenger operators and Part G of the Network Code for all operators*, Office of Rail Regulation, April 2008. This document may be accessed at [http://www.rail-reg.gov.uk/upload/pdf/pr08-poss\\_comp\\_pass\\_090408.pdf](http://www.rail-reg.gov.uk/upload/pdf/pr08-poss_comp_pass_090408.pdf).

## Current compensation arrangements

26.5 Train operators receive compensation for possessions and amended timetables through the following components:

- Under schedule 4, in return for the payment of an access charge supplement, franchised passenger operators receive formula based compensation for revenue losses 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), compensation for certain categories of costs (but not any additional revenue loss). Schedule 8 provides formula based revenue compensation for 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.
- 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.

## Concerns with the current regime

26.6 We understand from Network Rail and train operators that although the current regime has strengths it also has a number of weaknesses, namely:

- issues around the boundaries between schedule 4 and part G;
- an inconsistent approach to compensating train operators for the effects of possessions;
- concerns over the accuracy of compensation arrangements and the resulting economic signals;
- a lack of transparency in the part G and schedule 4 process; and
- unnecessarily high transaction costs.

26.7 Partly in response to these concerns we asked the industry to undertake a review of possessions compensation. One of the key outputs that we sought



from this review was the incorporation of all possessions compensation in schedule 4.<sup>118</sup>

## The industry recommendations

26.8 The industry's recommendations were consulted on and provided to us on 31 January 2008 and 14 March 2008.<sup>119,120,121</sup>

26.9 The main industry recommendations are on the passenger regime. These centre on the development of a tiered structure of compensation in schedule 4, providing formulaic cost and revenue compensation for all possessions, but with additional compensation available depending on the level and impact of disruption. In return for this, part G compensation for possessions would be withdrawn. In summary the characteristics of each of the proposed tiers are:

- Type 3 possessions (single possession > 120 hours (includes public holidays) would receive formula compensation as default but with the possibility of actual revenue losses and costs (subject to a materiality threshold);
- Type 2 possessions (single possession > 60 hours, but =< 120 hours, (excludes public holidays) would receive formula 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 (other possessions) would receive formula based revenue and cost compensation.

26.10 In addition to this it is also proposed to compensate for sustained planned disruption on a similar basis to type 3 possessions, which will be triggered when:

- the revenue loss compensation over 3 consecutive periods > 20% of defined service group revenue or over 7 consecutive periods > 15% of defined service group revenue; or

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<sup>118</sup> Our letter and remit for the industry is given in train operator compensation for possessions, Office of Rail Regulation, January 2007. This document can be accessed at [http://www.railreg.gov.uk/upload/pdf/pr08-toc\\_comp.pdf](http://www.railreg.gov.uk/upload/pdf/pr08-toc_comp.pdf)

<sup>119</sup> Consultation on the possessions compensation regime, Schedule 4 Policy Group, September 2007. This document can be accessed at [http://www.railreg.gov.uk/upload/pdf/cnslt\\_poss\\_comp\\_regime\\_270907.pdf](http://www.railreg.gov.uk/upload/pdf/cnslt_poss_comp_regime_270907.pdf)

<sup>120</sup> Periodic review 2008: Recommendation to ORR on changes to the regime for disruptive possessions, Schedule 4 Policy Group, January 2008. This document can be accessed at [http://www.rail-reg.gov.uk/upload/pdf/pr08-poss-recs\\_comp\\_regime\\_310108.pdf](http://www.rail-reg.gov.uk/upload/pdf/pr08-poss-recs_comp_regime_310108.pdf)

<sup>121</sup> Periodic review 2008: Recommendation to ORR on changes to the regime for disruptive possessions, Schedule 4 Policy Group, March 2008. This document can be accessed at [http://www.rail-reg.gov.uk/upload/pdf/pr08-rcmd\\_flwup\\_290208.pdf](http://www.rail-reg.gov.uk/upload/pdf/pr08-rcmd_flwup_290208.pdf)

- the difference between formulaic cost compensation and reasonably incurred costs > £0.5m over 3 consecutive periods or £1m over 7 consecutive periods (apart from Chiltern, Merseyrail, C2C and open access operators where values of £0.25m and £0.5m respectively are used to reflect the limited ability of smaller operators to absorb exceptional costs).

26.11 One of the main industry recommendations is the development of a cost formula to compensate for bus and train mileage costs resulting from possessions, made up 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 through weighting the actual impact on the service;
- net effect on costs of changes in train mileage – taking into account track access charges, fuel costs etc.

26.12 Other changes recommended by the industry were:

- an increase to the notification factors (increasing the amount of revenue compensation) to reflect better the way passengers perceive possessions;
- the inclusion of cost compensation from any unplanned extension of a restriction of use (i.e. possession overrun) as well as a planned restriction of use;
- the regime for franchised passenger operators would be funded through an access charge supplement paid by each operator;
- open access passenger operators would be able to claim type 3 and sustained planned disruption compensation, i.e. compensation for significant disruption, but would need to pay an access charge supplement (like franchised operators) to have access to compensation for type 1 and type 2 possessions;
- compensation for competent authority possessions which do not result from network change should be made through the schedule 4 possession regime - leaving it to Network Rail to recover associated costs directly from competent authorities; and
- Network Rail should 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.

## **Our consultation**

26.13 In April 2008 we consulted on the following issues:

- the industry's recommendations, as described above;
- timing of implementation (where the industry had been unable to reach agreement), where we recommended that changes to schedule 4/part G should be implemented on 1 April 2009;
- transitional arrangements – where we were not yet persuaded by the industry's recommendations to allow existing compensation arrangements to continue where the compensation or method has been agreed prior to the changes to the regime, and asked for evidence of any bespoke compensation arrangements which could extend beyond 1 April 2009;
- implementation of changes to part G of the network code where we recommended that the changes be progressed through the C8 process (by which we can require a change to the network code).

## Consultation responses

26.14 We have received 15 responses to our consultation. In general the responses supported the proposed changes to the regime and the introduction of changes to the network code using the C8 mechanism, although they did highlight some issues associated with the regime and its proposed implementation, in particular concerns were raised on:

- the size of the notification discounts and whether an additional notification point at T-26 is appropriate;
- the operation of the cost formula in terms of how the number of EBMs is calculated and compensated and the calculation of train mileage compensation;
- the sustained planned disruption threshold and how it applies to specific operators and services;
- on the day disruption and amended timetable impacts in relation to open access operators;
- potential transaction costs associated with implementation, although responses generally supported one-off implementation on 1 April 2009;
- transitional arrangements with two operators providing evidence of specific compensation arrangements extending beyond 1 April 2009 which has already been agreed.

26.15 These concerns are discussed in more detail below together with our determination.

## Our determination

26.16 Our response to the detailed issues raised by consultees on the proposed compensation arrangements is set out below. While in general we are content with the arrangements proposed by the industry working group we recognise that they will not (and cannot) reflect all circumstances. However we feel that they provide a consistent and transparent basis for calculating compensation and are an improvement on the current situation.

### *Revenue formula*

- 26.17 Arriva Trains Wales (ATW) suggested that there should be a much steeper reduction in the discounts than proposed to act as a better incentive on Network Rail to plan possessions earlier. We have considered ATW's proposal but are concerned that if discounts for earlier notification are made steeper then they would not reflect general passenger perceptions. The proposed discounts still provide a strong incentive on Network Rail to notify early. We are therefore content that the proposed discounts remain appropriate.
- 26.18 Virgin Trains and ATW have both suggested intermediate notification points at T-4 and T-26 respectively. The industry group considered different notification points particularly between T-12 and T-0 but felt that this would dilute the incentive on Network Rail to comply with T-12. Further, the notification point at T-26 would be similar to the one at the first working timetable and so we see little benefit of having an additional notification point at this time. We are content that the notification points should remain at: by the first working timetable; by the informed traveller timetable; and by actual timetable.
- 26.19 ATW suggested that the threshold for type 3 compensation for a single possession should be 105 rather than 120 hours (TfL also thought the 120 hour threshold to be too high). This would cover five consecutive days of disruption but not an Easter weekend of disruption. This issue was also raised as part of the industry consultation. We are content that the industry proposal of 120 hours continues to be appropriate as it will ensure that only the longest possessions are captured by the type 3 threshold.
- 26.20 ATW supported a re-opener threshold for type 2 or 3 possessions where either party could request a manual calculation where actuals differed from the formula result. However ATW suggested that the £10,000 threshold was arbitrary and a lower or percentage threshold should be used. There can be considerable transaction costs associated with calculating actual revenue losses or costs. The threshold has been chosen to ensure that such transaction costs are only incurred where the divergence in actual and formula costs is significant and is the same threshold that is currently used when allowing cost compensation for significant restrictions of use. We are therefore content that the threshold remains appropriate.

*Cost formula*

- 26.21 ATW raise three issues regarding the calculation of cost formula compensation. Firstly that EBM should be based on the length of railway route rather than length of road route, second that EBM should be based on duration of journeys rather than journey length and third that EBM should acknowledge situations where there is more than one bus per train. While we acknowledge that there will be many circumstances where the cost compensation might not be accurate, we continue to believe that the compensation rate is appropriate. The rate per EBM has been modelled / calculated across a number of TOCs and possession situations and so captures circumstances where road routes do not follow rail routes (for example in Scotland) and where more than one bus replaces a train. We therefore consider that on average the cost formula is reasonable in many circumstances and should ensure that Network Rail takes into account bus and rail costs when planning possessions.
- 26.22 TfL suggested that the calculation of formula based bus costs should not reduce the flexibility of operators to provide bus services in the most cost effective way. The formula will provide compensation regardless of actual costs and so operators will continue to have an incentive to provide bus services in the most cost effective way.
- 26.23 Northern Rail suggested that as variable track access charges are based on actual wear and tear costs Network Rail suffers no loss when TOC train mileage is reduced. Under the proposed regime Network Rail would receive compensation if train mileage was reduced (and pay compensation if it was increased). Northern suggested that this might create perverse incentives with TOCs effectively paying a penalty charge for having its services disrupted. It should be noted that the proposed regime provides compensation for both train mileage and replacement bus costs. Compensation for train mileage is received for escapable costs and includes fuel, maintenance and track access charges. For each of these costs Network Rail will receive a reduction in compensation payable if train mileage is reduced. However this benefit should be more than offset by the compensation that Network Rail has to pay for replacement bus costs, with replacement bus costs typically making up around 90% of the costs of possessions.
- 26.24 Virgin West Coast trains suggested the differential replacement bus compensation rates for long distance and London and South East services may be unfair where services compete directly, for example between London and Rugby. Different compensation rates will be applied depending on the service group, for example Great Western has some service groups where the London and South East rates will apply and others where the long distance/regional rate will apply. We do not consider that differential rates should apply within a service group due to the additional complexity that would arise. We are therefore content that the compensation rates remain appropriate.

- 26.25 Northern Rail suggested that the model results should be reviewed after a year to ensure that they were appropriate. We are content that the rates chosen are appropriate and should ensure on average that Network Rail adequately takes into account bus costs when planning possessions. Providing a re-opener for bus costs after a year would mean that access charge supplements would also need to be reviewed. Given that possessions are planned months and sometimes years in advance we do not consider such a re-opener to be appropriate. We do however consider that if service patterns change significantly then there should be a mechanism for changes to be made to the Estimated Bus Mile calculations, for example to the viable transfer points, and we will include suitable criteria in the next version of our criteria and procedures document.
- 26.26 ATW and TfL suggested that Arriva Trains Wales and London Overground should be included in the definition of small rail companies for the purposes of the cost threshold. ATW undertakes around 21m train km per annum, more than double the other small operators and so there does not appear to be a case for their inclusion. London Overground however does appear to be a similar size and so we will include it within the definition of small rail companies. We do acknowledge that wherever the threshold is set some operators close to the threshold might feel disadvantaged.
- 26.27 Govia suggested that the drafting relating to the allocation of costs for making amendments to Annex B of schedule 4 (relating to EBMs) should be amended so that the proposing party pay 90% of the other party's costs, rather than Network Rail claiming 90% of the costs it incurs as proposed as this would result in Network Rail being able to recover 90% of its costs where it proposed a change. We agree that the drafting should be amended so that the proposing party compensates 90% of the other party's costs.

## **Access charge supplements**

- 26.28 The Schedule 4 compensation regime for franchise passenger operators is funded by access charge supplements. As part of the SBP update, Network Rail proposed the level of individual access charge supplements for franchise passenger operators. Different supplements were proposed with and without the 7-day railway. We consulted the industry on Network Rail's proposals in April 2008 but did not receive substantive responses on the rates proposed although some consultees did emphasise that rates should be more cost reflective than previous estimates. We consider Network Rail's proposals to be more cost reflective than previous estimates.
- 26.29 Access charge supplements depend strongly on future levels of possessions and network availability. As we have stated in chapter 9 we support Network Rail's proposals for further development of the 7-day railway and are allowing some funding to support this. We are currently reviewing the forecasts of network availability. We are also reviewing Network Rail's assumptions on notification, in particular the assumption that 5% of possessions will continue to be notified at T-12. Both of these assumptions will impact on the proposed level of access charge supplements. As we are yet to conclude this review we

have, for now, simply used Network Rail's proposals for access charge supplements, taking into account the 7-day railway and the £3m adjusted to account for full bus costs. The resulting access charge supplements are given in table 26.1.

**Table 26.1: Access charge supplements**

£m (2006-07 prices)	2009-10	2010-11	2011-12	2012-13	2013-14
Arriva Trains Wales	1.4	1.3	1.3	1.1	1.1
Arriva Cross Country	14.3	13.2	12.9	11.0	10.7
c2c	2.5	2.3	2.2	1.9	1.9
Chiltern	2.8	2.6	2.5	2.2	2.1
East Midlands	7.7	7.1	7.0	6.0	5.8
First Capital Connect	7.8	7.2	7.1	6.0	5.8
First Great Western	40.5	37.4	36.7	31.3	30.4
Gatwick Express	3.2	2.9	2.9	2.5	2.4
Heathrow Connect	0.1	0.1	0.1	0.1	0.1
London Midland	2.4	2.2	2.1	1.8	1.8
London Overground	0.5	0.5	0.5	0.4	0.4
South Eastern	3.9	3.6	3.5	3.0	2.9
Merseyrail	2.8	2.6	2.5	2.2	2.1
Northern	2.5	2.3	2.3	1.9	1.9
National Express East Coast	38.4	35.4	34.7	29.6	28.7
National Express East Anglia	8.8	8.2	8.0	6.8	6.6
ScotRail	6.5	5.9	5.8	5.0	4.8
Southern	8.5	7.8	7.7	6.5	6.3
South West Trains	18.6	17.1	16.8	14.3	13.9
Trans Pennine Express	2.2	2.1	2.0	1.7	1.7
Virgin Cross Country	36.9	34.0	33.4	28.5	27.6
<b>Total</b>	<b>212.3</b>	<b>195.8</b>	<b>192.2</b>	<b>163.9</b>	<b>159.0</b>

## Open Access Operators

26.30 First Hull Trains indicated that they were concerned that whilst historically schedule 8 included 'on the day' disruption and amended timetable impacts, since CP2 the amended timetable disruption had been removed from schedule 4. This had resulted in open access operators ceasing to receive compensation for amended timetables and First Hull Trains proposed that this

was addressed as part of this review, as the current arrangements are wrong and discriminatory.

- 26.31 We are content that the proposed compensation arrangements are not discriminatory as open access operators can access wider compensation, including for amended timetable disruption, by paying the relevant Access Charge Supplement – this is on the same basis as franchised passenger operators obtain coverage.

## **Part G**

- 26.32 Stagecoach have requested that they receive confirmation direct from DfT that changes to part G would be considered part of the periodic review for the purposes of clause 18.1/no net loss no net gain (NNLNNG) arrangements in franchise agreements. We understand that DfT has subsequently sent confirmation to all TOCs that this is the case.
- 26.33 Whilst not directly connected with the changes consequent on the amendments to schedule 4, Network Rail proposed that there should be a time limit on any claim under the residual element of network change that will remain within part G. We agree that this is not part of this review and that therefore Network Rail should pursue such a proposal separately through industry processes for amending the network code.
- 26.34 TfL also assumed that there was an ability to claim for the long-term impact of network change following disruption - this is not the case. A residual capability to claim for network change will remain in part G to cover those circumstances where the Network has changed as a consequence of something other than the taking of a possession i.e. degradation of capability due to lack of maintenance etc.
- 26.35 We will be issuing part G for consultation again, including any further changes that may be identified, within our consultation on the proposed changes to the freight schedule 4 regime in July.
- 26.36 We will then issue our final conclusions on passenger and freight schedule 4, including legal drafting, alongside our C8 notice for revisions to Part G in August 2008.

## **Early engagement to discuss design and impact of possessions**

- 26.37 ATOC raised a concern that the new arrangements weakened the requirement for Network Rail to discuss the design and impact of possessions at an early stage. We believe that with the increased incentives introduced under the new structure Network Rail will be further incentivised to engage with train operators at an early stage so as to identify the most effective and efficient way to undertake possessions and so reduce the level of costs and therefore compensation payable. The incentive to minimise the impact of possessions will be further strengthened by the introduction of a regulated output network availability metric as discussed in chapter 4.



## Transitional arrangements and implementation

26.38 A number of consultees indicated that they were content for the new compensation arrangements to take effect from the start of the next control period on the understanding that transaction costs, associated with the calculation of franchise agreement clause 18.1 / schedule 9 adjustments, were kept to a minimum. Following discussion with DfT on the potential impact of introducing these changes with effect from 1 April 2009, we remain confident that to do so will not introduce an unnecessary burden on franchised train operators in respect of transaction costs associated with clause 18.1 / Schedule 9 adjustments. We are therefore proposing to introduce the changes with effect from 1 April 2009. Now that our proposals have been published as part of our draft determination we have asked DfT for further assurance. In response DfT have stated that:<sup>122</sup>

“the principles the Department proposes to adopt in implementing the variations to Franchise Agreements resulting from the Review, including the proposed changes to Schedule 4 and Part G, will be aimed at minimising the associated transaction costs by reaching agreement with the companies to adopt a process which will be aimed at not adding unduly to the level of resourcing required. It is envisaged that the development of this process will form part of the negotiation with each train operating company concerning agreement of the revised financial model inputs, arising from the Review. A separate process will be developed for those Train Operating Companies whose Franchise Agreement contains Clause 18.1. We are not yet in a position where we can give details of the specific process which will be adopted, as this cannot be defined until the effects of the review for each train operating company have been established.”

26.39 We understand that this letter has been circulated to all franchised TOCs. On this basis we are content that any transaction costs associated with implementing the new arrangements should be minimised.

26.40 In introducing the changes from the beginning of the control period we accept that in the case of specific works<sup>123</sup> associated with the WCML upgrade, specific compensation arrangements have been already agreed. The commercial agreements already in place will be allowed to remain in place for these specific schemes.

26.41 Possessions which are taken up to 31 March 2009 and run on into the new control period will also be compensated on existing commercial principles.

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<sup>122</sup> Letter from Jane Thomas to Tim Griffiths, 22 May 2008. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/compreg-dft-220508.pdf>.

<sup>123</sup> The specific works identified are the remodelling and renewals at Bletchley by the WCRM project for London Midland and all possessions included within documents NAUM-30 and the MKC PSN for Virgin West Coast Trains. We do not consider that possessions included in further NAUM documents associated with WCRM Upgrade works should be included as these can take into account the proposed new possession arrangements.

26.42 All other possessions taken on or after 1 April 2009 will be compensated under the revised commercial arrangements.

## 27. Financial incentives

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### Introduction

27.1 In this chapter we set out our determinations 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 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, 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 did not, however, set out the payment rates in February. These are set out below.

## **Volume incentive**

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, and their delivery will therefore be a condition of Network Rail's licence. 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 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 track 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 As we have previously stated, 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 February 2008, 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 increase 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 rail<sup>124</sup> 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 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

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<sup>124</sup> See Annex D of *Consultation on caps on freight track access charges*, Office of Rail Regulation, December 2006. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/310.pdf>.

traffic, we use a value of 2 pence per passenger mile (2006-07 prices and 2009 values).<sup>125</sup>

The existing payment rates convert the economic benefits of additional rail passengers into a benefit per train mile using relative growth rates. 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 guidance<sup>126</sup>. 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**

2006-07 prices	Value	Baseline annual growth
<b>Passenger</b>		
Per passenger train mile	70p	0.8%
% of additional revenue	1.4%	4.7% (real)
<b>Freight</b>		
Per freight train mile	102p	2.3%
Per freight 1000 gross tonne mile	92p	1.6%

<sup>125</sup> The economic value of passenger traffic is derived from WEBTAG Unit 3.13.2. This may be accessed at [http://www.webtag.org.uk/webdocuments/3\\_Expert/13\\_Rail/3.13.2.htm](http://www.webtag.org.uk/webdocuments/3_Expert/13_Rail/3.13.2.htm).

<sup>126</sup> *Sensitive Lorry Miles*, Strategic Rail Authority, May 2003. This may be accessed at <http://www.dft.gov.uk/pgr/freight/railfreight/simp/sensitivelorrymilesevaluatio3217>.

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.<sup>127</sup> 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:** The payment will be made to Network Rail as a lump sum cash payment at the beginning of CP5. This should significantly strengthen the power of the incentive versus the current RAB-based approach.<sup>128</sup> The payment in the next control period (rather than annual payments) fits with both the definition of capacity outputs in the HLOSs / freight RUS and the wish to provide government with budgetary certainty during CP4.

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.

## Efficiency benefit sharing mechanism

27.15 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.

27.16 We stated in our February 2008 document that we would implement a mechanism from the start of CP4 whereby TOCs and FOCs would share in Network Rail's outperformance of its regulatory efficiency assumptions where

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<sup>127</sup> See Table 12.1 of *Delivering a sustainable railway*, Department for Transport, July 2007. This document may be accessed at <http://www.dft.gov.uk/about/strategy/whitepapers/whitepapercm7176/whitepapersustainablerailway1>. Values have been converted from nominal into real using our inflation assumptions.

<sup>128</sup> See chapter 19 of *Access Charges Review 2003: Final Conclusions*, Office of the Rail Regulator, December 2003. This may be accessed at <http://www.railreg.gov.uk/upload/pdf/184.pdf>.

they demonstrably assist in that outperformance. This was widely supported by the industry.

- 27.17 We have always felt that, ideally, the detailed 'ownership' and design of the mechanism should be industry led. We have 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.
- 27.18 We set out the details of the intended mechanism in February 2008, reflecting the areas of agreement within the industry. We did not, however, set out the proportion of Network Rail's outperformance to be shared with operators. This is set out below.

*The type of efficiencies to be shared*

- 27.19 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.
- 27.20 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.
- 27.21 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).
- 27.22 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*

- 27.23 It is important that all parties have confidence that the measurement of outperformance used to calculate any efficiency shares is robust.
- 27.24 As set out in February 2008, our annual assessment of Network Rail's performance against its determination 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, our annual assessment of Network Rail will include an explicit statement of the outperformance to be shared under the benefit share mechanism. This will reflect our assessment of Network Rail's cumulative outperformance of its determination in the relevant areas in the control period up to the point of the assessment.

27.25 Importantly, 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 or the higher than expected income 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*

27.26 The mechanism will operate at the national level in the first instance, with separate schemes for England & Wales and Scotland.

27.27 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 choice of forum is for the industry to decide.

27.28 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*

27.29 Under the mechanism, Network Rail will share 25% of relevant outperformance with 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.

27.30 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.

#### *Timing of payments*

27.31 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.

- 27.32 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.
- 27.33 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.
- 27.34 As our assessment of Network Rail's efficiency performance is published in September each year, any benefit share payments to operators should be paid in the November following the end of the financial year to which the payments relate.

#### *Form of payments*

- 27.35 Any benefit shares will be payable to operators in cash (rather than, for example, funds earmarked for station investments). We believe this will provide a strong incentive to operators and is administratively straightforward.
- 27.36 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.

#### *Implementation*

- 27.37 We intend to include this mechanism in Schedule 7 of track access contracts. In order for the incentive to be effective, it is crucial that DfT and Transport Scotland do not claw back all the benefits received by train operators under the terms of franchise agreements. We are discussing this issue with DfT and Transport Scotland.

#### *Reviewing the mechanism*

- 27.38 Provided that any benefit share payments to operators represent legitimate reward for engagement with Network Rail on reducing the cost of the railway, the mechanism will help the industry to move to a lower overall cost base than would have otherwise occurred.
- 27.39 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.

### **Fine tuning the delivery of the HLOSs**

- 27.40 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

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### Introduction

- 28.1 We made our announcements on the initial assessment of HLOS affordability, on 20 December 2007<sup>129,130</sup> and we provided further information in February 2008.<sup>131</sup>
- 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;
  - a summary of how much revenue we believe Network Rail is likely to require to deliver the HLOSs; and
  - a summary of the 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.<sup>132</sup> Broadly, our affordability calculation is based on:
- the information on franchise support costs that DfT and Transport Scotland have provided to us;

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<sup>129</sup> *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 <http://www.rail-reg.gov.uk/upload/pdf/pr08-hlosdif-DfT-201207.pdf>.

<sup>130</sup> *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 <http://www.rail-reg.gov.uk/upload/pdf/pr08-hlosdif-TS-201207.pdf>.

<sup>131</sup> *Update on the framework for setting 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>.

<sup>132</sup> *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](http://www.rail-reg.gov.uk/upload/pdf/316.pdf).

- 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 in each geographic area 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 paid for through the amortisation allowance and the allowed return. Where expenditure exceeds the amortisation allowance and allowed return Network Rail borrows to fund the expenditure. 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 assumed all enhancement projects are RAB funded.

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.<sup>133</sup> 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 (an RPI + 1% increase each year) and unregulated fares are assumed to rise in line with regulated fares for forecasting purposes.

## Our analysis of DfT's forecasts

- 28.10 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.
- 28.11 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.
- 28.12 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*

- 28.13 We reviewed the information provided by DfT and assessed against our criteria of consistency, completeness and reasonableness. In terms of consistency we considered whether the forecasts used consistent internal assumptions and whether these were consistent with assumptions made

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<sup>133</sup> *Delivering a Sustainable Railway*, DfT, July 2007. This may be accessed on the DfT website at <http://www.dft.gov.uk/about/strategy/whitepapers/whitepapercm7176/whitepapersustainable railway1>.

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.

- 28.14 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.
- 28.15 Overall, we did not see any basis for changing the DfT assumptions on base franchise revenues and costs.

#### *Franchise revenues*

- 28.16 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.
- 28.17 It is impossible to say with certainty whether rapid revenue growth will continue. 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*

- 28.18 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.
- 28.19 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 significant demand growth could be challenging. We took this into account in our overall analysis (see below).
- 28.20 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*

- 28.21 When DfT submitted its HLOS in July 2007, it estimated that at least 1300 extra 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 have not used it as the basis for our determinations.
- 28.22 The main reason for differences between the DfT July 2007 estimate and Network Rail’s 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.
- 28.23 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 update and it produced an analysis based on 1519 new vehicles being required (in line with its earlier estimates on rolling stock).
- 28.24 Network Rail’s analysis was necessarily based on a number of assumptions given the fact that few firm decisions have 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.
- 28.25 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*

- 28.26 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

28.27 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.

28.28 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.

28.29 We believe that it is prudent to adopt the Network Rail view on additional rolling stock and we have also generally adopted its view on depots and stabling requirements. 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 constructions costs into an estimate of the impact on HLOS affordability, making an adjustment to the capital cost of depots and stabling as described above.

28.30 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

28.31 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:

- their '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.

28.32 In April 2008 Transport Scotland updated its forecasts to reflect new information, including the recently extended Scotrail franchise and information on its major projects.

### **Our analysis of Transport Scotland's financial forecasts**

28.33 The franchise financial picture is simpler in Scotland than in England & Wales, with Scotrail the only call on Transport Scotland 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.

28.34 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 have used Transport Scotland's base franchise subsidy forecast in our calculations.

28.35 We reviewed the incremental franchise costs which were based on an assumption that new vehicles would be needed in CP4.

28.36 We concluded that the forecasts were reasonable and have used them in our affordability assessment.

### **Network Rail's revenue requirement**

28.37 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 these determinations 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. We have asked Transport Scotland, as part of its response to our consultation on these draft determinations, to indicate whether it wishes to incorporate any Tier 3 works within our final determination, up to the SoFA limit.

28.38 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).

28.39 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
<b>Gross revenue requirement</b>	<b>4,731</b>	<b>4,762</b>	<b>4,789</b>	<b>4,779</b>	<b>4,778</b>	<b>23,839</b>
Less schedule 4 and 8 expenditure	(200)	(184)	(181)	(154)	(150)	(868)
Less third party income	(283)	(281)	(291)	(307)	(317)	(1,479)
<b>Revenue requirement to deliver the HLOS</b>	<b>4,248</b>	<b>4,296</b>	<b>4,318</b>	<b>4,318</b>	<b>4,312</b>	<b>21,492</b>

**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
<b>Gross revenue requirement</b>	<b>536</b>	<b>542</b>	<b>544</b>	<b>541</b>	<b>535</b>	<b>2,699</b>
Less schedule 4 and 8 expenditure	(13)	(12)	(12)	(10)	(10)	(56)
Less third party income	(23)	(22)	(22)	(22)	(21)	(109)
<b>Revenue requirement to deliver the HLOS</b>	<b>500</b>	<b>508</b>	<b>511</b>	<b>510</b>	<b>505</b>	<b>2,534</b>

## Results of our affordability assessment

28.40 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
<b>SoFA</b>	<b>2,888</b>	<b>2,699</b>	<b>2,706</b>	<b>2,567</b>	<b>2,444</b>	<b>13,302</b>
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
<b>Funds available for Network Rail</b>	<b>4,256</b>	<b>4,320</b>	<b>4,605</b>	<b>4,703</b>	<b>4,866</b>	<b>22,749</b>
Less Network Rail revenue requirement to deliver the HLOS**	4,248	4,296	4,318	4,318	4,312	21,492
<b>Surplus/(deficit)</b>	<b>8</b>	<b>24</b>	<b>286</b>	<b>385</b>	<b>554</b>	<b>1,257</b>

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
<b>SoFA</b>	<b>759</b>	<b>826</b>	<b>676</b>	<b>668</b>	<b>673</b>	<b>3,600</b>
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
<b>Funds available for Network Rail</b>	<b>588</b>	<b>645</b>	<b>467</b>	<b>458</b>	<b>456</b>	<b>2,612</b>
Less Network Rail revenue requirement to deliver the HLOS*	500	508	511	510	505	2,534
<b>Surplus/(deficit)</b>	<b>87</b>	<b>137</b>	<b>(44)</b>	<b>(52)</b>	<b>(49)</b>	<b>78</b>

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).

28.41 We have concluded that both the England & Wales and Scotland HLOSs are affordable. The England & Wales HLOS is affordable in each year of CP4 and for the control period as a whole. The Scotland HLOS is affordable for the control period as a whole although there are deficits in individual years. For our final determination we must ensure that there are no deficits in any individual year. This could be achieved through some reprofiling of Network Rail's income or effectively through reprofiling the other calls on the SoFA (which would be managed by Transport Scotland). We will discuss these options with Transport Scotland and Network Rail before we publish our final determinations.

### Testing affordability in England & Wales with an alternative inflation forecast

28.42 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).

28.43 We have produced our own forecast of inflation (RPI). We have reviewed the available inflation forecasts and produced our own forecast, as shown in table 28.5. Our forecast is based on a detailed review of a range of inflation forecasts and examined historic differences in the measures of inflation. We have examined the robustness of over 30 different forecasts used by HM Treasury (which are updated on a quarterly basis). We have also considered recent national and international economic developments. We have selected a central value from this range, taking into account historic trends and recent economic developments.

**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	4.3*	3.90	3.15	2.90	2.85	2.75	2.75

Note: \*Actual (November 2006 to November 2007 RPI).

28.44 In England & Wales, applying our assumptions on inflation reduces the surplus funds available from £1.3bn to around £800m. On this basis, we conclude that the affordability assessment is robust to our updated inflation forecast for CP4.



# **PART G: IMPLEMENTATION, EARLY START AND HOLDING NETWORK RAIL TO ACCOUNT**



## 29. Implementation

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### Introduction

- 29.1 This chapter sets out how our determinations are implemented into track and station access contracts. This follows the process set out in Schedule 4A of the Railways Act 1993.
- 29.2 The chapter sets out:
- how the statutory implementation process works;
  - an overview of which contracts are within the scope of these changes following the arrangements specified in the review initiation notice;
  - how we have, or are going about, identifying relevant changes to contracts to underpin our determinations; and
  - our recent consultation on the proposed change to franchised passenger operators contracts to allow the determinations to be implemented if Network Rail rejects the review notice.

### Access charges review notices

- 29.3 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.<sup>134</sup> It affects both track and station access contracts.
- 29.4 We intend to publish our final determinations on 30 October 2008. This document will set out our conclusions which will be incorporated into the subsequent review notice. The implementation process requires us to issue a series of notices:
- the review notice(s);
  - the notice(s) of agreement; and
  - the review implementation notice(s).
- 29.5 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;

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<sup>134</sup> *Review initiation notice*, Office of Rail Regulation, February 2007. This may be accessed at [http://www.rail-reg.gov.uk/upload/pdf/PR08\\_note-of-proposal.pdf](http://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.

29.6 We intend to issue the review notice(s) on 18 December 2008.

29.7 We will specify a period of not less than six weeks from the date of publication of a review notice in which Network Rail<sup>135</sup> 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 up to six weeks to make any objections to the new notice.

29.8 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.

29.9 If no termination notice is given, a review implementation notice will be published. It must state that our conclusions are 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.

29.10 1 April 2009 is our intended date of implementation of the conclusions of PR08. We will send separate review notices containing revised Schedules 4, 7 and 8 of the track access agreement 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*

29.11 This part of the PR08 process is currently working to the dates shown in table 30.1

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<sup>135</sup> 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'.

**Table 30.1: Key dates for the implementation process**<sup>136</sup>

Milestone	Date
Final determinations	30 October 2008
Issue review notice	18 December 2008
Deadline for Network Rail response	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 agreements

- 29.12 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. Following the publication of these draft determinations we will complete our work to produce drafting for consultation in respect of the relevant changes which give effect to our draft conclusions.
- 29.13 We will consider what interaction is appropriate with stakeholders (Network Rail, DfT, operators) in advance of publishing our consultation document in July. We hope to work closely with our stakeholders in the production of the drafting and to publish the proposed changes during July 2008 for consultation.
- 29.14 We recognise that, as at previous reviews, specific contracts 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 contracts. It will be the responsibility of train operators and Network Rail in the first instance to highlight such areas in response to our consultation on proposed changes in July 2008.

## Licence modifications

- 29.15 Changes to Network Rail's licence are being implemented over the same timescale as this review. These are discussed in a separate consultation document.

<sup>136</sup> Assuming no reference to the Competition Commission or revisions to the review notice.

## Dealing with a Competition Commission referral and “rollover”

- 29.16 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 contracts.<sup>137,138</sup> The amendment allows the contents of any review notice served by us when implementing PR08 (and any future access charges review) to have effect in franchised passenger train operators’ track access contracts regardless of whether the implementation process is then delayed, as a result of Network Rail exercising its statutory right to object to the notice.
- 29.17 This change to track access contracts does not affect either Network Rail’s or train operators’ ability to make submissions to the Competition Commission. We have discussed this with the Competition Commission to make sure they support our approach.
- 29.18 Our approach means that the CP4 arrangements contained in the PR08 final determinations 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:
- 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.
- 29.19 As the vast majority of provisions that time expire are found in franchised passenger operator track access contracts, we only proposed that the changes be made in these contracts and not in those of freight or open access operators. Both governments have indicated that this would be covered by ‘clause 18.1’.<sup>139</sup>

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<sup>137</sup> *Periodic Review 2008 implementation*, Office of Rail Regulation, April 2008. This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/pr08-implementationlet-230408.pdf>.

<sup>138</sup> 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.

<sup>139</sup> 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.



29.20 We are reviewing the responses to our consultation and will continue to develop the general approval wording to allow the changes to the track access contracts to be implemented.



## 30. Early start

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### Introduction

- 30.1 In this chapter we set out our decisions for the early start programme. Early start means that we approve now – in advance of the final determinations – expenditure on certain projects for the first year of the control period.
- 30.2 We are approving early start for a range of work now, having approved some work in our update on the framework for setting outputs and access charges in February 2008. There are however some projects where we have not been able to agree to early start funding.

### Background

- 30.3 We set out our policy on ‘early start’ in our advice to Ministers document. We said that without sufficient clarity on the required deliverables (or the allowed revenue/expenditure) there is a risk that Network Rail could delay investment at the start of CP4. We are keen to minimise the risk of this arising, which could have a detrimental impact on Network Rail’s customers and funders. Delay could also heighten uncertainty and hence costs in the supply industry.
- 30.4 We asked Network Rail to propose in its SBP expenditure and outputs for the first year of CP4 (2009-10) that it considers should qualify for the early start programme. In order to qualify for consideration for early start funding the investment would have to have a defined (observable/measurable) output, have clear and agreed dates for delivery, have firm cost proposals, and have funder support (if relevant).
- 30.5 Network Rail set out in its SBP the outputs it proposes for early start decisions on the funding for the first year of CP4, in order for it to have sufficient certainty in order to proceed with the work. This work covers:
- four specific signalling renewal schemes;
  - eight specific enhancement schemes (King’s Cross, Airdrie to Bathgate, Thameslink, Reading, Birmingham New Street, South West main line 10 car, Bletchley – Milton Keynes and North London Line)
  - the Network Rail discretionary fund (NRDF);
  - the national stations improvement programme (NSIP); and
  - the access for all programme.
- 30.6 In February 2008 we approved early start for NSIP, access for all and the Airdrie to Bathgate and Thameslink enhancement schemes. We also stated that we would not be making any specific early start allowance for signalling

schemes as Network Rail had not provided us with sufficient information or justified why they should be included as part of an early start funding programme. We have not received sufficient information to change our view on these schemes and so we have not approved early start funding for any signalling schemes.

## Assessment of outstanding proposed early start schemes

30.7 We have done further work and our proposals or current position is as follows:

### *Schemes accepted for early start*

- **Reading:** the scheme is required by the England & Wales HLOS and scheme development has progressed such that we have greater visibility of outputs and costs. We therefore agree to early start for this scheme.
- **Birmingham New Street:** as with Reading, the scheme is required by the England & Wales HLOS and scheme development has progressed such that we have greater visibility of outputs and costs. Network Rail's role as part of the wider regeneration project and the risk share arrangements are also clearer. We therefore agree this scheme for early start.
- **Kings Cross:** again this scheme is required by the England & Wales HLOS. Although the projected costs for CP4 have increased, largely as a result of slippage, we have reviewed these costs and can confirm that they are reasonable. Output definition is sufficiently clear. We therefore agree this scheme for early start.
- **Bletchley to Milton Keynes:** also required by the England & Wales HLOS. This project has been reviewed by the independent reporter and we have only made relatively small cost adjustments. This scheme is also approved for early start.
- **North London Line:** the costs for this scheme included in the SBP update relate to the incremental costs of brought forward renewals as TfL is funding enhancement costs. In this context we have approved the scheme for early start.

### *Schemes not accepted for early start*

- **South West main line 10-car:** Network Rail says this scheme is needed to help deliver the London capacity metric for the England & Wales HLOS. Although we have set Network Rail's revenue requirement based on the inclusion of this scheme, the costs are still at an early stage of development and we are not approving for early start.
- **NRDF:** we support continuation of the NRDF in CP4, but we do not think that it is essential that we provide Network Rail with confirmation on early start funding for NRDF now. The NRDF schemes are all small-scale schemes and Network Rail should be able as part of its ongoing business

planning to start development of NRDF for 2009-10 as necessary. Moreover the NRDF programme does not relate to any specific outputs and therefore by definition the company has some flexibility over the timing of delivery of the actual outputs taken forward. We have therefore not included this scheme for early start.



# 31. Holding Network Rail to account

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## Introduction

- 31.1 This determination, in the context of the network licence, establishes a range of obligations on Network Rail. One of our responsibilities following completion of the review will be to monitor how Network Rail meets those obligations and, if necessary, to take action to enforce them.
- 31.2 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.
- 31.3 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

- 31.4 Our monitoring will focus primarily on the following issues:
- whether the industry is on course to deliver the HLOS safety requirement;
  - whether the top level regulated outputs are being delivered;
  - whether the programme of works to deliver the capacity specifications of the two HLOSs is on course to deliver the required outputs;
  - 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.
- 31.5 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.

- 31.6 We will seek to minimise the regulatory burden on Network Rail by using the statistics 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.
- 31.7 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.
- 31.8 We will continue to use regulatory reporters to audit and provide expert commentary on the information we receive from Network Rail. The current reporter contracts expire in 2009 and we will review the terms of reference before we tender for reporters for CP4 to ensure that these cover the critical areas going forward.

#### *Safety*

- 31.9 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.

#### *Top level regulated outputs*

- 31.10 We will monitor delivery of the top-level train performance output 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 recently developed, so that we understand the reasons for trends in the top level figures.
- 31.11 We will monitor average station condition annually through Network Rail's annual return, as this measure changes only slowly.

#### *Capacity*

- 31.12 We will monitor Network Rail's progress in taking enhancement schemes through its GRIP process, and in achieving key scheme milestones as set out in its CP4 delivery plan.

#### *Asset management and sustainability*

- 31.13 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.
- 31.14 We will also monitor the levels of renewals activity and compare them with the levels Network Rail has included in the SBP update, which are based on its defined asset policies and which (except for civil engineering assets) are essentially the volumes on which this determination is based.
- 31.15 If Network Rail departs materially from the condition trajectories in the delivery plan or the activity levels on which this determination is based we will call on it



to demonstrate clearly that it is nonetheless complying with its asset management licence obligations.

31.16 More details of the indicators and trajectories were presented in chapter 4.

#### *Finance and efficiency*

31.17 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, as part of our Annual Assessment. This will involve assessing progress both in achieving unit cost and scope efficiencies and in rolling out the unit cost reporting framework.

31.18 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.

31.19 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**

31.20 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. 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.<sup>140</sup>

### **Monitoring publications**

31.21 We will continue to publish full assessments of Network Rail's performance annually, and shorter focussed assessments in the Network Rail Monitor. We will review the form and content of both publications from time to time to ensure that they are achieving our objective of communicating these matters effectively.

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<sup>140</sup>

This may be accessed at <http://www.rail-reg.gov.uk/upload/pdf/287a.pdf>.



## ***Annex A: Specific objectives for PR08***

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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 B: Draft notice for Network Rail's 2009 business plan***

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*Note: 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 to condition 7 in the requirements for the content of the business plan shall be read by reference to the equivalent successor in the network licence that contains network management obligations.*

We are interested in your views on our proposals for the content of the notice to be issued under condition 7.4.2(b) of Network Rail's network licence, specifying the level of detail, format, structure and relevant standards and periods for Network Rail's 2009 business plan. This constitutes the consultation required under condition 7.4.3(b) of the network licence.

Our proposals are set out below.

### **Structure and timing**

1. Network Rail, having consulted its customers and funders in the process of developing its business plan, should publish its plan so that it contains distinct sections as follows:

- (a) an executive summary; and
- (b) a detailed plan which demonstrates in sufficient detail Network Rail's plans to satisfy the purpose of condition 7 for the period 1 April 2009 to 31 March 2014 including:
  - (i) a section on the delivery of disaggregated outputs for England & Wales and for Scotland; and
  - (ii) route plans for each of Network Rail's 26 routes disaggregated where appropriate for England & Wales and for Scotland.

2. Network Rail must publish its plan no later than 27 February 2009 for assessment against our PR08 determinations.

### **Information to be specified in the 2009 business plan**

3. The business plan must:

- (a) show how Network Rail plans to meet the targets established in the PR08 final determinations including:
  - (i) safety - the actions that train operators and, specifically, Network Rail plan to take in order to deliver the High Level Output Specification (HLOS) target; and the actions Network Rail 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;
- (ii) reliability of train performance - details of how Network Rail will deliver train performance, with trajectories disaggregated by train operator. These must deliver the PR08 determinations and should reflect joint performance improvement plans (JPIPs) where they exist;
  - (iii) network capacity - details of clear deliverables and milestones for Network Rail's contributions to the capacity enhancement schemes directly specified in, or otherwise required by, the HLOSs (these are listed at Annex D of this publication) together with:
    - statements on the approach taken to address EU interoperability requirements in working up enhancement schemes;
    - clarification of which projects Network Rail will take forward to deliver the strategic freight network concept, including milestones;
    - details of any work planned on new or enhanced depots and stabling which is necessary to cater for the additional passenger rolling stock required to deliver HLOS capacity outputs;
  - (iv) network capability – details of the reference source for the capability of the network at 1 April 2009 in terms of, but not limited to:
    - track mileage and layout;
    - linespeed;
    - gauge;
    - route availability; and
    - electrification type/miles;
  - (v) network availability - plans showing how Network Rail will meet its network availability targets for passenger and freight operators, together with details on the plans to roll out the 'seven day railway' concept and how it fits with the attainment of the availability targets;
  - (vi) stations - details for station categories A to F that will show how the CP4 top level regulated targets will be met. Such details will include:

- planned expenditure by Station Facility Owner, for both NSIP expenditure and total expenditure;
  - the above on a route basis;
- (b) show how Network Rail plans to meet other targets including:
- (i) depots - plans for the activities and expenditure at depots to show how the planned trajectory for average condition will be achieved;
  - (ii) asset serviceability and sustainability - the targets Network Rail sets for the principal asset groups including:
    - (i) asset stewardship performance indicators as reported in its strategic business plan:
      - good/poor track geometry;
      - geometry faults per 100 track km (primary and secondary);
      - immediate action geometry faults per 100km (network);
      - immediate action rail defects per 100km (primary and secondary);
      - rail breaks per 100km (network);
      - civils assets subject to inspection (number per annum);
      - TSRs imposed (severity index);
      - station stewardship measure - station categories A-F;
      - sub station and contact systems condition;
      - traction power incidents causing train delays;
      - signalling failures (number per annum);
      - points and track circuit failures (number per annum);
    - (ii) planned activity levels and condition measures for:
      - rail breaks (per 100km by route type);
      - rail defects discrete (per 100km) by route type (immediate and intervention level);
      - rail defects contiguous locations by route type;

- track geometry standard deviations by route type;
  - immediate action geometry faults by route type;
  - Structures Condition Marking Index (to be developed for all structure types as well as bridges);
  - number of TSRs applied to structures and earthworks in poor condition;
  - number of earthworks failures;
  - drainage measures;
  - TSRs due to track faults by route type;
  - ESRs due to track faults by route type;
  - signal asset condition;
  - number of relay rooms with fragile wiring notices;
  - number of signalling equivalent units commissioned;
  - number of signalling equivalent units developed;
  - number of level crossing equivalent units commissioned;
  - number of level crossing equivalent units developed;
  - existing infrastructure delay measures (number of incidents and delay caused);
  - asset volume renewal measures including but not limited to M20-M29;
  - track renewal quality;
  - delivery of whole life cost track maintenance activities, e.g. repadding, rail grinding, rail lubrication, track drainage etc;
- (c) contain details which otherwise satisfy the purpose and duty of condition 7 of its network licence for CP4, including route plans which:
- (i) contain disaggregated information on renewals, enhancements and volumes and expenditure on a route by route basis to provide a comparison between the plans on different routes and show how activity plans affect outputs at route level and which summarise proposed expenditure, activity and outputs for England & Wales and Scotland;



- (ii) indicate cancellation, postponement or other changes of enhancement plans to provide a comparison with the April 2008 Strategic Business Plan update;
  - (iii) reflect the development of Route Utilisation Strategies and Network Rail's understanding of the capacity and capability of the network, and enable Network Rail's customers to plan their businesses with a reasonable degree of assurance;
  - (iv) describe the assumptions Network Rail has made about future demand for both passenger and freight services on a route by route basis;
- (d) confirmation of the RUS programme and justification of any incompatibilities between route plans and existing RUSs;
  - (e) describe the initiatives Network Rail is taking to drive further efficiency in the business, including the company's approach to procurement, and demonstrate how these will be both sustainable and efficient;
  - (f) describe the initiatives Network Rail is taking to ensure it has adequate human and other resources to deliver the business plan and how those initiatives are progressing;
  - (g) contain specific objectives and targets to improve Network Rail's environmental performance and details to show how they will be delivered; and
  - (h) be in a format which will enable ORR, providers and potential providers of services relating to railways, and funders and potential funders of services relating to railways to compare like for like over time.

The business plan will set the parameters against which we will agree the form and content of the annual return, to enable the company to report in the annual return actual outputs, achievement and expenditure against the estimates and projections in the plan.

## **Change process**

The top level regulated targets we set in our PR08 final determinations are not expected to change. However, it is possible that changes in circumstances and requirements may mean that Network Rail might need to propose changes to some elements of its delivery plan, which would otherwise form reasonable requirements under condition 7 of the network licence. We have already explained in our PR08 draft determinations, published June 2008, where we would expect a change process to apply.



## ***Annex C: Train performance***

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### **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 draft determinations.
2. 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**

3. 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.'
4. In its April update Network Rail has produced a comprehensive revision of this analysis and it is a significant improvement. It is based on further close working with passenger and freight operators, which we very much welcome. In addition to the published plan Network Rail has provided us with supporting evidence.
5. As the April update supersedes the strategic business plan proposal the remainder of this chapter deals mainly with the April material.
6. 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.
7. 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 their proposed approach to ensure that both PPM and significant lateness targets were met.
8. The approach to improving performance and the impact on PPM is summarised in table C.1, and the impact on significant lateness is shown in table C.2.

**Table C.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%
<b>Contributions from core initiatives</b>					
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%
<b>Sub-total</b>	<b>1.58%</b>	<b>1.44%</b>	<b>1.55%</b>	<b>2.74%</b>	<b>91.75</b>
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%

<b>Sub-total</b>	<b>-0.17%</b>	<b>-0.40%</b>	<b>0.16%</b>	<b>0.24%</b>	<b>0.25%</b>
End CP4 with no further measures (baseline)	92.01%	92.31%	91.79%	90.61%	92%
HLOS target	92.6% <sup>141</sup>	93.0%	92%	92%	92%
Gap		0.69%	0.21%	1.39%	0.0%

**Table C.2: Network Rail’s plans to deliver England & Wales significant lateness targets (% of trains significantly late)**

	<b>LSE</b>	<b>Regional</b>	<b>Long distance</b>
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

9. We have reviewed each stage of Network Rail’s approach, with assistance from Winder Phillips Associates<sup>142</sup>. We first consider the plans for England & Wales, followed by those for Scotland.

### **England & Wales – starting point**

10. 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.

### **Core initiatives**

11. 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;

<sup>141</sup> For illustration. The HLOS targets are sector based.

<sup>142</sup> *Review of Network Rail’s performance improvement plans*, Winder Phillips Associates, May 2008. This can be accessed at <http://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 GSMR.
12. 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 their 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**

13. 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.
14. We fully recognise that these areas of risk are genuine. 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.
15. We have built this adjustment into our assessment, but we stress that Network Rail must continue to seek ways to reduce the impact of these factors.

### **Performance gains from other enhancements**

16. Network Rail is being funded for a substantial programme of enhancements, for example to deliver the HLOS specified projects and to deliver the England & Wales capacity specification. It is important that the performance benefits from these schemes are taken into account in the analysis.

17. 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 final year PPM figure.
18. The projects shown in table C.3 were identified as having a PPM benefit.

**Table C.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 <sup>rd</sup> track reducing conflicts
Hitchin	New flyover
York Holgate	2 <sup>nd</sup> 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

19. The SBP update shows a 0.14% PPM improvement from these schemes (an increase compared to the SBP). 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.

### **Operator contributions to improved performance**

20. 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.
21. An additional 0.05% increase in national PPM is projected as a result of a 12.5% reduction in FOC-on-self delays.
22. Overall, reductions in operators' delays are expected to deliver a 0.54% improvement in PPM.
23. Although these figures have not yet been fully underwritten by all operators, we believe that Network Rail's assumptions are reasonable.

## Calculating the gap

24. Adding together all these impacts, there remains a gap to the HLOS figures for each sector in both PPM and significant lateness, as shown in table C.4.

**Table C.4: 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%

25. 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

26. Network Rail proposes a number of measures to close the gaps, as shown in table C.5.

**Table C.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

27. It provided an analysis of how it had assessed the value for money of each proposal, in terms of performance benefit per pound spent. It has modelled this based on the following inputs:

- 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.

28. It considered a number of possible ways of combining these measures into different baskets, producing a preferred basket as shown in table C.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 C.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

<b>Total cost</b>	<b>250.2</b>
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29. We have 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.
30. Our analysis of Network Rail's value for money model suggests that there is an alternative basket of measures costing around £200m which would deliver the same PPM benefits.
31. As we believe that the gap between the baseline projection and the HLOS targets is less than that calculated by Network Rail, fewer measures would be required to reach the targets. Our calculations suggest a total cost of around £180m on a like for like basis.
32. 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 believe 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.
33. Overall we have 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 have therefore concluded that the incremental funding for performance should be £160m.
34. Network Rail's analysis also showed that the PPM of two TOCs, National Express East Coast and First Great Western, would still be below 90% at the end of the control period (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 bring these TOCs over the 90% threshold:
  - 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.
35. 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.

## Scotland

36. Network Rail followed the same analytical process when considering how to meet the 92% PPM HLOS target for Scotrail services.
37. 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.

38. Network Rail's proposals are reasonable and deliver the HLOS target.

### **Further regulated outputs**

39. 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.
40. 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.



## ***Annex D: ORR assessment of enhancement schemes in Network Rail's SBP update***

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This annex summarises our review of the enhancement schemes proposed in Network Rail's SBP update. The table is structured as follows:

### **England and Wales**

#### **a) Funding included within our PR08 determination**

- **HLOS baseline and specified schemes:** Network Rail is funded to deliver these defined schemes.
- **Schemes to deliver the passenger kms specification and the HLOS London capacity specification:** Network Rail is funded to deliver these specific schemes which contribute to both the passenger kms by route specification and the London capacity specification.
- **Further schemes required to deliver HLOS capacity specifications for London and other specified urban areas:** We have determined the efficient level of funding based on these schemes, but Network Rail has the flexibility to decide which schemes should be taken forward (providing it delivers the capacity specification) and it must set out its preferred approach in its CP4 delivery plan.
- **HLOS Performance fund:** Network Rail is provided with this fund 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.

#### **b) Funding not included within our PR08 determination**

- Schemes which Network Rail proposed but which, in our assessment, are not needed to deliver the explicit requirements of the HLOS and are not justified on other criteria.

### **Scotland**

### Funding included within our PR08 determination

- **Scotland HLOS** : Network Rail is funded for these schemes specified in the Scotland HLOS.
- **Other Scotland schemes**: other schemes proposed by Network Rail. These were: station information and surveillance systems and GSM-R coverage of freight only lines. Funding is provided for GSM-R works.

**Table A: Our assessment of enhancement schemes in Network Rail’s SBP update (£m 2006-07 prices)**

Route	Scheme name	Network Rail SBP	Our assessment
<b>England and Wales</b>			
<b>a) Funding included within our PR08 determination</b>			
<b>HLOS baseline schemes</b>			
	Access for all	206	206
	King's Cross	175	175
	West Coast: Stafford/ Colwich remodelling	483	364
	West Coast: Bletchley/ Milton Keynes	114	107
	West Coast power supply upgrade	272	235
<b>Sub total baseline schemes</b>		<b>1,251</b>	<b>1,087</b>
<b>HLOS Specified schemes</b>			
	Thameslink	2,700	2,700
	Intercity express programme	260	260
	Network rail discretionary fund	234	234
	National station improvement programme	156	156
	Strategic freight network	208	208
	Reading area redevelopment	456	441
	Birmingham New Street gateway project	128	128
<b>Sub total specified schemes</b>		<b>4,141</b>	<b>4,127</b>
<b>Schemes to deliver HLOS capacity metrics for London and other specified urban areas</b>			
	Route 1: Kent		
1	12 car operations Sidcup and Bexleyheath routes	5	-
1	Power supply enhancements	19	16

Route	Scheme name	Network Rail SBP	Our assessment
1	12-car operations: Dartford to Rochester including Gravesend	15	13
1	12-car operations: Greenwich and Woolwich routes	3	3
1	12-car operations: Hayes and Sevenoaks (stopping) services	0	0
1	New Cross Enhancement to power supply	15	13
1	8-car operations: Victoria Eastern to Bellingham	5	4
1	8-car operations: Swanley-Ashford-Canterbury West-Ramsgate	4	3
1	12-car operations: Swanley to Rochester	5	4
	Route 2: Brighton main line and Sussex		
2	Power supply enhancements	18	15
2	Gatwick Airport remodelling and passenger capacity	30	9
2	East Croydon passenger capacity scheme	12	12
2	Suburban area 10-car operations to Victoria and London Bridge	76	65
	Route 3: South West main line		
3	Power supply enhancements	35	29
3	Waterloo International Terminal conversion	53	49
3	Clapham Junction station capacity and platform lengthening	56	20
3	10 Car South West suburban railway	110	76
3	Reading southern platforms	21	18
	Route 5: West Anglia		
5	West Anglia outer services 12-car trains	27	21
5	Power supply enhancements	3	1
5	Seven Sisters small works	2	2
	Route 6: North London line and Thameside		
6	Power supply enhancements	-	-
6	Tilbury Loop platform extensions	20	16
	Route 7: Great Eastern		
7	Power supply enhancements	6	2

Route	Scheme name	Network Rail SBP	Our assessment
7	Chadwell Heath turnback	4	3
	Route 8: East coast main line		
8	Platform lengthening (First Capital Connect services)	12	10
8	Moorgate branch improvements	5	5
	Route 10: North Trans-Pennine, North and West Yorkshire		
10	Capacity improvements (Leeds area)	94	60
	Route 11: South Trans-Pennine, South Yorkshire and Lincolnshire		
11	South Yorkshire - platform lengthening	11	1
11	Stabling for Northern (South Yorkshire)	10	9
	Route 13: Great Western main line		
13	Maidenhead and Twyford (relief lines)	3	3
	Route 16: Chilterns		
16	Chiltern platform lengthening	9	6
	Route 17: West Midlands		
17	Platform lengthening (West Midlands)	32	19
	Route 19: Midland Main Line and East Midlands		
19	East Midlands platform extensions	5	5
	Route 20: North West urban		
20	Capacity improvements (Manchester area)	99	60
<b>Sub total capacity metrics</b>		<b>824</b>	<b>573</b>
<b>Schemes to deliver both the route kms metric and the HLOS London capacity metric</b>			
8	Alexandra Palace to Finsbury Park 3rd Up Line project	46	37
8	Hitchin Grade separation	50	47
8	East Coast main line level crossing closures	20	19
8	York Holgate junction 4th line	10	10
8	Peterborough Station re-development and additional island platform	28	27
8	Shaftholme Junction re-modelling	42	47



Route	Scheme name	Network Rail SBP	Our assessment
8	Capacity relief to the East Coast Main Line (joint line via Spalding)	248	233
8	Finsbury Park – Alexandra Palace down improvements	14	14
<b>Sub total combined capacity/route kms</b>		<b>458</b>	<b>433</b>
Risk	Risk adjustment for DfT capacity schemes	216	177
<b>Sub Total England and Wales all HLOS capacity schemes</b>		<b>1,498</b>	<b>1,184</b>
<b>HLOS performance fund</b>		<b>250</b>	<b>160</b>
<b>Sub total England and Wales HLOS schemes</b>		<b>7,144</b>	<b>6,558</b>
<b>Schemes meeting the criteria</b>			
<b>Schemes meeting the criteria previously classes by Network Rail as HLOS capacity schemes</b>			
6	North London Line capacity enhancement	44	28
13	Cardiff capacity (Barry - Cardiff Queen Street corridor)	20	19
17	Redditch branch enhancement	16	15
17	Extension of cross city services to Bromsgrove	11	24
Risk	Risk adjustment	15	15
<b>Sub total</b>		<b>106</b>	<b>102</b>
<b>Other schemes meeting the criteria</b>			
8	East Coast Mainline overhead line enhancement	35	30
13	Cotswold Line re-doubling options	51	48
13	Westerleigh - Barnt Green linespeed upgrade	32	8
16	Wrexham to London Marylebone journey time improvements	5	5
19	Midland Mainline St Pancras - Sheffield line speed improvements	59	55
	Trans Pennine Express linespeed improvements	26	25
Risk	Risk adjustment of value for money schemes	31	26
	Projects to support move towards a seven day railway	320	160
	Development fund for CP5 schemes	240	50

Route	Scheme name	Network Rail SBP	Our assessment
	"Policy choices" (GSM-R freight only branches, Station information and surveillance systems, DC lines regenerative braking)	167	63
<b>Sub total</b>		<b>966</b>	<b>470</b>
<b>Total England and Wales schemes meeting the criteria</b>		<b>1,072</b>	<b>574</b>
<b>b) Funding not included with our PR08 determination</b>			
	West Croydon track capacity	15	-
	Didcot – Oxford area capacity upgrade	19	-
	Bolton corridor package	7	-
	Buxton line capacity and line speed improvements	15	-
	Doncaster Loversall Carr junction revised operational layout	6	-
	Hertford Loop (including Gordon Hill loops)	16	-
	Swindon-Kemble redoubling	32	-
	Redhill remodelling	25	-
	Crewe remodelling	58	-
	Reading station area- platform 1-8 renewals	26	-
	East Midlands resignalling - Nottingham station area	19	-
	Round Oak to Walsall reopening	10	-
	West Croydon station development	5	-
	West Anglia inner 9 car trains	32	-
	Liverpool Central passenger capacity	12	-
	Liverpool James Street	8	-
	Cogan junction upgrade	5	-
	Ninian Park to Radyr (City Line) linespeed improvements	5	-
	Birmingham New Street new bay platform	3	-
	Fenchurch Street and Chafford Hundred passenger circulation	2	-
	Risk	44	-
<b>Total schemes not funded</b>		<b>365</b>	
<b>Total England and Wales</b>		<b>8,581</b>	<b>7,132</b>
<b>Scotland- funding included within our PR08</b>			

Route	Scheme name	Network Rail SBP	Our assessment
<b>determination</b>			
<b>Scotland HLOS projects</b>			
Scot	Airdrie - Bathgate	185	189
Scot	Glasgow Airport rail link	173	135
Scot	Borders railway	3	3
Scot	Glasgow to Kilmarnock	12	12
Scot	Tier 3 project development	13	13
Scot	Small projects fund	20	20
<b>Sub total Scotland HLOS projects</b>		<b>406</b>	<b>372</b>
<b>Other Scotland projects</b>			
Scot	Seven day railway (Scotland)	30	-
Scot	"Policy choices"	12	3
<b>Sub total other Scotland projects</b>		<b>42</b>	<b>3</b>
<b>Total Scotland</b>		<b>448</b>	<b>375</b>

Note <sup>1</sup>: Totals may not sum due to rounding.

Note <sup>2</sup>: 0 indicates that the number is less than £0.5m.

Note <sup>3</sup>: – indicates zero.



## ***Annex E: 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, whilst statutory depreciation is provided by Network Rail in its financial model. We will require an update of this estimate for our final determinations, which may give rise to a change in the levels of the grant calculated.
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 E.1 to E.3.

**Table E.1: Calculation of Network grants in England & Wales (investment test)**

<b>£m (2006-07 prices)</b>	<b>2009-10</b>	<b>2010-11</b>	<b>2011-12</b>	<b>2012-13</b>	<b>2013-14</b>
<b>Investment test</b>					
<b>Network grant</b>	<b>3,039</b>	<b>3,055</b>	<b>3,099</b>	<b>2,932</b>	<b>2,756</b>
Renewals	2,264	2,012	1,775	1,641	1,560
Enhancements	1,519	1,801	1,325	1,291	1,196
<b>Renewals &amp; enhancements</b>	<b>3,783</b>	<b>3,813</b>	<b>3,100</b>	<b>2,932</b>	<b>2,756</b>
<b>Investment test (maximum 100%)</b>	<b>80%</b>	<b>80%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

**Table E.2: Calculation of Network grants in Scotland (investment test)**

£m (2006-07 prices)	2009-10	2010-11	2011-12	2012-13	2013-14
<b>Investment test</b>					
<b>Network grant</b>	<b>355</b>	<b>358</b>	<b>338</b>	<b>232</b>	<b>193</b>
Renewals	297	290	256	223	186
Enhancements	160	116	83	8	7
<b>Renewals &amp; enhancements</b>	<b>457</b>	<b>406</b>	<b>338</b>	<b>232</b>	<b>193</b>
<b>Investment test (maximum 100%)</b>	<b>78%</b>	<b>88%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

**Table E.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
<b>Market body test</b>					
<b>Network grant (total GB)</b>	<b>3,396</b>	<b>3,414</b>	<b>3,437</b>	<b>3,164</b>	<b>2,949</b>
Fixed and variable track access charges	1,261	1,287	1,289	1,532	1,737
Other single till income	610	603	607	624	628
<b>Annual income from sales</b>	<b>1,871</b>	<b>1,890</b>	<b>1,897</b>	<b>2,156</b>	<b>2,366</b>
Opex and maintenance	2,076	2,012	1,947	1,889	1,828
Depreciation per statutory accounts	1,325	1,425	1,501	1,554	1,591
<b>Production costs</b>	<b>3,401</b>	<b>3,437</b>	<b>3,448</b>	<b>3,443</b>	<b>3,419</b>
<b>Market body test (minimum level 50%) plus headroom of 5%</b>	<b>55%</b>	<b>55%</b>	<b>55%</b>	<b>63%</b>	<b>69%</b>