Office of Rail Regulation

Part A Independent Reporter Mandate

Mandate AO/048: Network Rail 2013/14 Regulatory Accounts

Year-end review

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Contents

Glossary

ASI	Asset Stewardship Indicator
CaSL	Cancellations and Significant Lateness
CEM	Cost Efficiency Measure
ckm	Composite kilometres
CP3	Control Period 3 (2004/05 – 2008/09)
CP4	Control Period 4 (2009/10 – 2013/14)
CP5	Control Period 5 (2014/15 – 2018/19)
E&P	Electrification and Fixed Plant
ERTMS	European Rail Traffic Management System (signalling system)
FTN	Fixed Telecom Network
GRIP	Governance for Railway Investment Projects process
GSM-R	Global System for Mobile Communications - Railway
IT	Information Technology
KPI	Key Performance Indicator
LMDSM	Light Maintenance Depot Stewardship Measure
LNE	Network Rail London North Eastern route
LNW	Network Rail London North Western route
MNT	Maintenance activity code
MDU	Maintenance Delivery Unit
MUC	Maintenance Unit Cost
NDS	National Delivery Service
O&CS	Operations and Customer Service
OLE	Overhead Line Electrification
ORR	Office of Rail Regulation
P&M	Plant & Machinery
PMA	Positive Management Action
PPM	Public Performance Measure
PR08	ORR Periodic Review 2008
RAGS	Regulatory Accounting Guidelines
REEM	Real Economic Efficiency Measure
RUC	Renewals Unit Cost
S&C	Switches and Crossings
S, P & C	Signalling, Power & Communications
SBP	Strategic Business Plan
SCADA	Substation Control And Data Acquisition
SEU	Signal Equivalent Unit
SICA	Signalling Infrastructure Condition Assessment
SSI	Signalling Stewardship Indicator
SSM	Station Stewardship Measure
YTD	Year to Date

1 Executive summary

1.1 Introduction

This report presents the findings of Arup's review of selected expenditure data and efficiency calculations in Network Rail's 2013/14 Regulatory Statements. The objective of our Independent Reporter review has been to determine the reliability and accuracy of information in specific statements as set out in our mandate. We have also assessed the degree to which Network Rail's reporting has improved from previous years, taking into account previous recommendations as well as providing recommendations for efficiency reporting going forward into CP5. Further information on the scope of our work, our approach and the guidance we have used is given in Chapter 2 and Appendix A.

1.2 REEM efficiency reporting process

Network Rail followed a similar process to previous years for reporting REEM efficiencies in this, the last, year of the current control period. However, we received less information than in previous years, which has limited the review that we were able to perform. In particular, we have not received a copy of Network Rail's REEM efficiency model. Although we were provided with summary sheets showing the efficiency calculation for each cost and asset area this limited the extent to which we could analyse baseline and expenditure numbers used in the calculations.

Network Rail has informed us that it has discontinued usage of its REEM model since the 2012/13 review, because it provided no useful information for Network Rail management and was only prepared annually for the benefit of Arup's review. [1] This is at odds with Network Rail's stated position in previous years, whereby Network Rail supported the usage of its REEM model for the purposes of improving transparency and reliability in the reporting process (as had been recommended by Arup in our 2010/11 review). To support this year's efficiency reporting, we consider that continued utilisation of the model would have made comparison of activity levels and efficiencies between 2013/14 and previous years more straightforward, providing a consolidated overview of activity levels and efficiencies throughout the control period. We also consider that utilising the model effectively could have reduced risks of errors in the REEM calculation (a problem that has recurred again in 2013/14 resulting in late alterations to some of the reported efficiency figures). We consider the reinstatement of an efficiency reporting model based on the same principles as the REEM model to be essential to support effective reporting of efficiency by Network Rail going forward (see recommendation below).

We were somewhat limited in the extent to which we could rely upon Network Rail's efficiency monitoring process. For example, as was the case last year, there were no minutes from internal efficiency review meetings between central finance and asset teams. After making significant progress in 2011/12 we have found that Network Rail has allowed the efficiency reporting process to decline for the

[1] Network Rail also recently stated that utilisation of the model, with its various spreadsheets, is likely to have increased the risks of differences emerging between the different figures.

second year in succession, with even less evidence provided for this year's review than last year.

Production of this year's report (as well as Arup's opinion letter) has been subject to considerable delay, mainly due to delays in the provision of information by Network Rail. According to the original schedule anticipated by Arup in our study proposal, information from Network Rail was due to be provided for review by 10th May 2014; however, Network Rail did not finish providing initially requested information until 21st July 2014. As a result, provision of Arup's initial report was delayed from the original proposed date of 30th May 2014 to 27th July 2014. Following on from receipt of comments and feedback from Network Rail and the ORR (culminating in a consultation meeting on 20th August 2014) and the release of our draft final report on 2nd September 2014, the release of our final report (v.1.0) was delayed from 27th June 2014 to 16th September 2014. A further minor alteration to the Executive Summary has resulted in the release of this, the updated final report (version 1.1), on 22nd September.

1.3 REEM efficiency overview

The table below shows that Network Rail is reporting a total efficiency of 15.5% for 2013/14. This ranges from an inefficiency of just under 1% for controllable operating expenditure to an efficiency of just over 29% for maintenance expenditure.

REEM efficiency 2013/14	Baseline (£m)	Actual (£m)	Actual efficiency (£m)	Actual efficiency %
Controllable opex	1,079.9	1,089.7	-9.8	-0.9%
Maintenance	1,333.6	944.9	388.7	29.1%
Renewals	2,941.3	2,490.3	451.0	15.3%
Total	**5,354.8**	**4,524.9**	**829.9**	**15.5%**

Table E1: Headline REEM efficiency numbers for 2013/14.

The ORR's adjusted target efficiency[2] for Network Rail for the final year of CP4 (2013/14) was 23.5%. As indicated in the table below, with actual efficiency for the end of 2013/14 at 15.5% Network Rail has underperformed against the target by 8%.

[2] The efficiency assumption that the regulator set out in its PR08 determination for the end of the CP4 was 21%. Network Rail subsequently made lower efficiency savings in 2008-09 (the last year of CP3) than the ORR had expected, resulting in it starting CP4 in a worse position than the ORR assumed in the PR08 determination Consequently, Network Rail's efficiency challenge of 23.5% was higher than the efficiency improvements the regulator assumed in its PR08 determination.

REEM efficiency 2013/14	ORR target efficiency (adjusted[3]) %	Actual efficiency %	Under-performance (-) / out-performance (+) %	Under-performance (-) / out-performance (+) amount (£m)
Controllable opex	15.3%	-0.9%	-16.2%	-175.0
Maintenance	25.5%	29.1%	3.6%	48.6
Renewals	25.2%	15.3%	-9.9%	-290.2
Total	**23.5%**	**15.5%**	**-8.0%**	**-416.6**

Table E2: Reported REEM efficiency versus efficiency trajectory expected by ORR for 2013/14.

1.4 Operations expenditure efficiency

Network Rail is reporting an inefficiency of just under 1% on controllable operating expenditure, which totalled £1.1 billion in 2013/14. This was the first year in the control period in which it has not met or exceeded the efficiency target in this area. Operating expenditure is split into £475 million Operations and Customer Services costs, for which Network Rail is reporting an efficiency of 5.3%, and £615 million of Support costs which are 6.3% inefficient in year.

We were provided with reasonable explanations of Positive Management Actions (PMAs) for all Operations and Customer Services efficiencies that had been achieved, as well as PMAs supporting a sample of the reported Support cost efficiencies. In both areas, savings have arisen from organisation rationalisation resulting in lower headcount, including the transfer of staff to other parts of the business, and less paid overtime. Savings have also been achieved from renegotiating or cancelling contracts.

For Support Costs, Network Rail also provided us with a breakdown of the eighteen cost categories. Three of the six largest areas of spend are inefficient against their baseline with the largest inefficiency reported within Group costs, of nearly £127 million. The main cost items resulting in the inefficiency are a £63 million redundancy provision and a £76.5 million provision for the fine that ORR levied[4] because Network Rail did not achieve performance targets in 2013/14.

We consider there is a low or no risk that operating cost efficiency savings will have an adverse impact on the performance and long-term sustainability of infrastructure assets. Savings largely relate to administrative and central functions that do not typically have a direct impact on asset condition and capability.

1.5 Maintenance efficiency

Network Rail has exceeded the regulator's efficiency target for every year in CP4, achieving an efficiency saving of 29.1% (£389 million) in 2013/14 against an adjusted target of 25.5%, with actual maintenance expenditure totalling £945

[3] See previous footnote
[4] The regulator confirmed that the fine would be £53.1 million on 7 July 2014, and Network Rail has agreed to use the remainder on initiatives to improve performance

million. This encompasses additional efficiency savings (outperformance) of nearly £50 million.

Network Rail has provided PMA evidence to support the reported maintenance efficiencies on a similar basis to last year. This has included a breakdown according to four resource categories: labour, plant and vehicles, materials and other. The largest monetary saving of £237 million (17.8%) has been on labour, through headcount reductions, transfer of staff to other business activities and overtime control. Some of the maintenance efficiencies achieved have been through the transfer of staff and recharging of costs to renewal activities.

Network Rail has also provided a breakdown of efficiency savings according to specific PMAs, although the level of detail provided is limited. The largest PMA is "other local and national management actions", to which Network Rail attributes efficiency savings of £143m (10.7%). Although Network Rail has informed us that locally-driven initiatives are too numerous to list, we have been provided with small number of illustrative examples from last year (2013/14), which Network Rail considers to be representative of the types of local initiatives continuing to drive efficiency at a local level.

The next two most significant PMAs identified by Network Rail relate to organisational restructuring and headcount reductions. Network Rail reports efficiencies of £89 million (6.7% of baseline spend) relating to the transfer of some 1,750 staff to "Capex works maintenance delivery teams", and their associated costs, from opex to capex activities; further savings of £59m (4.4%) are attributed to "Phase 2bc" restructuring with resultant headcount reductions.

PMA detail has been provided for eight further categories collectively accounting further efficiencies of ca. £57m (4.4% of baseline spend). However, there remains a considerable value of efficiency savings – ca. £40m (3.0% of baseline) – which Network Rail is unable to link to any specific activities or initiatives.

As was the case last year, Network Rail has not been able to give a breakdown of 2013/14 maintenance spend versus baseline (2008/09) by volume and unit cost, due to changes to the MUC framework. As a result, there is an absence of any visible connection between PMA measures described and the quantified activity levels and unit cost reductions resulting in cost savings. We consider this issue needs to be addressed for the reporting of efficiency in CP5 (see recommendation below).

Overall, the PMA evidence remains incomplete in terms of detail, and limited in terms of its explanation relative to cost savings, with no improvement in the level of detail compared to last year.

Robustness and sustainability

Network Rail did not meet nine out its ten regulatory train performance targets in 2013/14. Network Rail has stated that extreme weather and traffic growth were the largest contributors to exceeding the regulated delay measures. However, it acknowledges that increased reactionary delay due to infrastructure failure and failure rates higher than forecast were also contributing factors. The number of infrastructure incidents leading to delay has increased overall between 2012/13 and 2013/14, with total delay minutes increasing as a result. These causes can be directly influenced by level of maintenance activity, and could be adversely affected by volume savings that are contributing to the reported efficiencies.

Based on our analysis of underlying asset reliability measures and regulatory targets, we consider that there is material uncertainty regarding the robustness of maintenance efficiencies, particularly with regard to track and electrification assets.

Track-related delay incidents have increased by 6.7% in 2013/14. Track and signalling faults were identified by Network Rail as a contributing factor on seven out of ten routes for higher delay minutes in 2013/14 than 2012/13. We consider certain areas of track-related expenditure for which volume efficiencies are reported are examples of areas in which reduced activity levels cannot be decoupled from asset-related failures experienced during the year. We have identified volume changes in a number of areas that have contributed, in net terms, £35m of savings.

Delay incidents relating to electrification assets during 2013/14 also exceeded target levels set out by the regulator. For certain categories of maintenance activity relating to electrification assets we have also not received sufficient evidence that activity levels were sufficient to avoid the shortfall in performance in this asset category. Although Network Rail is reporting, in net terms, volume inefficiency of around £69m for the relevant activity areas, it is not clear to what extent this may understate the level of inefficiency, in light of electrification-related delay incidents in excess of target levels.

Notwithstanding the shortfalls noted above, Network Rail has highlighted that there has been a significant improvement compared to the end of CP3, highlighting for example, the 45% improvement in points failures, the 28% improvement in track circuit failures and the 17% improvement in traction power incidents compared to 2008/09.

With regard to sustainability, in spite of the reliability problems discussed above, the ASI and other measures that can be associated with long term asset performance do not indicate trends that would suggest there is a material risk of decline going forward. The weighted asset indicator has improved in year, and over the control period as a whole.

Nevertheless, in light of our concerns regarding the robustness of reported maintenance efficiencies highlighted above, we also consider that the sustainability of maintenance efficiency measures – particularly around volume reductions – must be continually monitored going forward, to ensure that Network Rail avoids the risk of insidious decline or long-term risks around asset condition and performance in the future.

Overall, considering all the evidence we have received, we believe that there is material uncertainty regarding the robustness of Network Rail's maintenance efficiencies. As with previous years, we would require further evidence and analysis to be able to quantify the impact of maintenance savings during 2013/14 which may have led to performance failures and therefore should not be claimed as efficiency.

1.6 Renewals efficiency

Network Rail reported an efficiency of 15.3% on its renewals expenditure of £2,490 million in 2013/14. The efficiency is higher than that reported within 2012/13 but is nearly 10 percentage points below the adjusted target of 25.2% for

the end of CP4. This represents an under-performance in monetary terms of around £292 million.

Renewals efficiency by asset category	REEM baseline (£m)	2013/14 Actual (£m)	2013/14 Efficiency (£m)	% Efficiency
Track	1,110.4	1,012.4	98.0	8.8%
Signalling	619.1	541.3	77.8	12.6%
Civils	Not included in the 2013/14 REEM calculation			
Buildings (Operational property)	314.4	260.8	53.6	17.1%
Electrification	270.4	177.3	93.2	34.4%
Telecoms	146.5	105.7	40.8	27.9%
Fixed Telecom Network	76.9	92.2	-15.4	-20.0%
Plant & Machinery	160.2	95.1	65.1	40.7%
IT & Corporate Offices	137.1	120.6	16.5	12.0%
Other	106.3	84.9	21.4	20.2%
Total	**2,941.3**	**2,490.3**	**451.0**	**15.3%**

Table E3: Detail of renewals REEM efficiency numbers for 2013/14

Three assets - track, signalling and electrification – are responsible for over half of the reported efficiency savings. We comment below on efficiencies reported for individual asset categories, with the exception of "IT & Corporate Offices" and "Other" which we consider not to be material within the context of our assessment of renewals efficiencies.[5] As occurred last year, in agreement with the ORR, civil assets have been excluded from the REEM efficiency calculation.

1.6.1 Track

Track renewals represent some 40% of renewals expenditure in 2013/14, making this the largest renewals expenditure area. Network Rail is reporting an efficiency of £98 million (8.8%).

Track renewals are split into plain line and switches and crossings (S&C), for which Network Rail identifies volume and unit cost efficiencies, and non-volume work. It is reporting an inefficiency on plain line unit costs of £48m (-7.1%) and an inefficiency on non-volume work of £73m (-60%). With respect to volume efficiency, Network Rail has claimed efficiency savings on both plain line and S&C, which account for efficiency savings of £118m (17.6%) and £65m (20.8%) respectively. We consider the PMA evidence provided by Network Rail provides a reasonable level of clarity and detail to explain how the reported track renewals efficiency savings were made.

[5] We do not consider "IT & Corporate Offices" and "Other" renewals efficiencies to be areas of material relevance for our review. Such areas of spend do not relate to Network Rail's principal asset base through which it delivers its regulated outputs (network capacity, capability, reliability etc.). Therefore we have not subjected these areas of renewals efficiency to direct scrutiny (unlike track, signalling, etc.).

With regard to volume savings, in early CP4 Network Rail and the ORR agreed a change in asset policy that focused on full renewals for the most critical routes and utilisation of other interventions (e.g. refurbishment) at less critical locations. This has allowed Network Rail to reduce the overall volume of renewal work, resulting in volume efficiencies. However, taking into account the revised asset policy, Network Rail's delivered volumes at the end of CP4 for Plain Line remain below target, with a 6.8% shortfall in the CP4 total compared to the target volume set. We understand that the loss of volume up to the end of 2013/14 has been on critical routes: LNW, LNE and Western. Although Network Rail has not formally requested a deferral of the missed track volumes into CP5, we understand that these renewals will need to be delivered during CP5. Because of the resulting re-prioritisation of work, some volumes will also now be deferred from CP5 to CP6. Network Rail has stated the Plain Line volume shortfalls have occurred due to access problems and the lack of availability of high output machinery. Having reviewed the evidence, it is evident that these issues have yet to be resolved by Network Rail and are an on-going concern for CP5. The ORR has pointed out that completely different supply chain arrangements will be in place in CP5 that should increase incentives for contractors to fully deliver planned volumes.[6]

Whilst Network Rail has met three out of four key track geometry indicators (in improvement compared to last year when it only met two) it has still not met the target for track geometry faults per 100km – although we note the shortfall is fairly modest.[7] Network Rail has stated that a shortfall in ballast renewal and refurbishment is a key contributing factor to track geometry faults and these activities will be prioritised in CP5 to improve performance.

Overall, whilst there is no direct indication that Network Rail's track renewals volume efficiencies during CP4 are unsustainable, we consider continued delivery shortfalls during 2013/14 have led to an increased risk that Network Rail will be unable to deliver the required Plain Line volume during early CP5. We consider this may present a sustainability issue around Network Rail's renewals volumes in future.

1.6.2 Signalling

Over a fifth of renewals spend has been incurred on signalling assets in 2013/14. Network Rail is reporting an efficiency of £77.8 million, 12.6% against baseline, which is lower than the level achieved in previous years. Network Rail delivered the volume of standard signalling units it had budgeted for in the control period as well as additional standard units associated with the re-scoping of the Crossrail project[8] – although this meant a reduction in the number of ERTMS units originally planned for delivery as part of Crossrail. [9] Network Rail under-delivered on the planned number of level crossing units during CP4 by 39%.

[6] The ORR has indicated that contractors will only be paid for volumes delivered, rather than being paid regardless of whether or not volumes were actually delivered as was previously the case.
[7] Network Rail reported a total of 36.5 geometry faults per 100km, slightly above the target of 35.9 faults per 100km.
[8] Crossrail work is not included within the REEM efficiency calculation because it was not expected at the start of the control period.
[9] Network Rail also changed how it is rolling-out the ERTMS programme during the control period and, as a result, deferred £52 million of ERTMS work into CP5. A further £13.6 million of

We have been provided with a good level of information to explain how signalling efficiencies have been achieved. The majority of efficiencies, £100.2 million, are achieved on projects in the "GRIP 5-8" stages – where projects are at an advanced stage of design or in delivery. We have been provided with a project by project breakdown explaining how volume and unit cost savings have been achieved on such projects. A further £24.1 million efficiency has been identified on projects in early design, "GRIP 1-4 stages". We consider there to be a risk that these efficiencies could be subject to reversal when projects enter the delivery phase in CP5, because they have been calculated assuming PR08 efficiency targets will be fully met. Network Rail has provided evidence indicating that during CP4, outturn cost rates of GRIP 5-8 signalling projects have exceeded the targeted levels of efficiency savings rather than fallen short. We consider on this basis that there is not a high probability that outturn unit costs are likely to end up significant higher than expected in future, although the risk remains. The efficiencies above are higher than the overall signalling efficiency because there is an inefficiency of £46.6 million reported for other signalling renewals expenditure. This includes non-volume, level crossing, modular signaling and ERTMS renewals for which a reasonable degree of explanatory evidence has been provided. However, non-volume expenditure also includes accounting adjustments, for which no specific project-related information was provided.

We have not identified any specific concerns around the robustness and sustainability of Network Rail's reported signalling renewals efficiencies. Although there are issues with the reliability of signalling assets[10], we consider these to be associated with maintenance (as discussed above in Section 1.5). Network Rail has highlighted that it has made significant reliability improvements since the end of CP3, with track circuits improving by 28%, points failures by 45% and signal failures by 31%. With regard to long-term sustainability, the condition of signalling assets as measured through the Signalling Infrastructure Conditional Assessment (SICA), has been better than target for the whole of 2013/14. While Network Rail has recorded a slightly worse condition for its level crossings internal measure in 2013/14, only two per cent of undelivered level crossing renewals have required mitigation work stemming from condition risk.

1.6.3 Buildings

Network Rail has calculated an efficiency of 17.0% (£53.6 million) for buildings renewals. Scotland is responsible for three quarters of the efficiency although it only represents a small proportion of actual expenditure in year. This is because Network Rail had in previous years over-stated the amount of work it deferred in Scotland from year to year. There is more certainty over deferrals this year as any work carried over to CP5 has had to be agreed with the ORR. Network Rail has deferred £14 million of work at Paddington Station, with this amount removed from the baseline before efficiencies have been calculated.

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signalling renewals have been deferred from 2013/14 into CP5 so that signaling renewals are aligned with the National Operating Strategy to establish control centres at route level.

[10] Network Rail has recorded higher than target failure rates for three of its key signalling performance measures: track circuit, points and signalling failures causing delays of more than ten minutes. We consider this to be principally a maintenance issue as discussed in Sections 1.5 and 6.4.2.

We consider there are shortcomings in how efficiencies achieved in buildings have been quantified and attributed to PMAs. Four PMAs – workbank planning, design to cost, cost modeling and investment and efficiency project governance – were introduced to achieve efficiencies. From the evidence we have been presented with it appears that Network Rail has not sought to validate whether the level of efficiency expected from these initiatives has been achieved. It could have reviewed the source and extent of savings on specific projects. We are however satisfied that Network Rail's reported station and depot asset condition demonstrates that efficiencies are not resulting in a deterioration of the asset – as reflected through improving scores in the indices Station Stewardship Measure (SSM) and Light Maintenance Depot Stewardship Measure (LMDSM) ahead of regulatory targets for 2013/14.

1.6.4 Telecoms and FTN

Network Rail reports Telecoms and FTN as separate renewals categories. The FTN category encompasses infrastructure development to support the roll-out of a specific system, GSM-R[11], whilst all other telecoms asset renewals are captured in the "telecoms" category.

Telecoms efficiencies

In 2013/14, there has been a £40.8 million efficiency for Telecoms renewals, which equates to 27.8% against the adjusted baseline for the year. We are satisfied that the evidence for how these efficiencies were achieved is reasonable, with details of PMAs at project level for the majority of efficiencies reported.

FTN efficiencies

Network Rail has reported £15.4 million inefficiency on the delivery of FTN renewals, an underperformance of 20% against the asset baseline. FTN renewals work has recorded an inefficiency throughout CP4, with 2013/14 being the largest in percentage terms against baseline.

Robustness and sustainability

Both telecoms assets and the assets categorized for REEM under FTN are reported under the same asset performance measures. Issues have arisen with the reliability of the GSM-R system during 2013/14. From a technical perspective, GSM-R is an established technology which should not be experiencing reliability problems. Network Rail has informed us that these issues have been as much the result of behavioural and cultural issues amongst train drivers using the system in particular as specific technical problems. Network Rail has also informed us that problems with earlier software releases supporting the system's operation are being addressed, and that it expects system performance to improve within CP5. Although this alleviates some of our concerns regarding the robustness of the FTN renewals programme, we consider that Network Rail will need to work closely with train operators to ensure the effective functioning and correct utilisation of the technology, in order to ensure the robustness of the GSM-R renewal programme (and associated efficiencies) going forward.

[11] The system allows wireless communication between trains and control centres

With regard to sustainability, the Telecoms Asset Condition score, excluding GSM-R, was 0.977 in 2013/14, an improvement from the previous year. As the score is still lower than 1.0, we consider further improvement will be needed to avoid a sustainability risk during CP5.

1.6.5 Electrification

The efficiency of £92.2 million (34.4%) that Network Rail is reporting for electrification is a considerable increase on last year. Adjustments for work rescheduled from previous years have resulted in a near doubling of the baseline for 2013/14. Arguably, some of this work was not required and could have been claimed as efficiency, rather than slippage (i.e. deferral within the control period), in previous years.

A significant amount of work, £111 million - which is almost 20% of outturn for the control period, has been deferred into CP5. Work has been deferred in three areas of renewals works: SCADA (£36.6 million),[12] Great Eastern OLE renewal (£24.4 million) and various renewals works in Sussex, Wessex and Kent (£50.1 million)[13]. Network Rail told us that much of the work on the latter two projects will be commissioned in 2014/15 so the impact of the deferral on asset robustness and sustainability is not significant. Because of this evidence, Arup did not flag the shortfall and deferral of planned electrification works in our regulatory accounts opinion letter.

With regard to robustness, for its performance measure for electrification assets (traction power service failures greater than 300 minutes) Network Rail reports incidents in excess of target level during 2013/14. One of the root causes identified by Network Rail for the increased failure rate has been an increase in equipment design faults. However, these incidents do not appear to be directly related to deferrals in Network Rail's renewal programme. Network Rail has provided information showing that the excess delay incidents mainly occurred on the LNE and LNW routes – neither of which has had renewals works subject to deferral. We consider uncertainty relating to robustness of electrification assets to be more an issue around maintenance activity levels – as discussed previously.

With regard to long-term sustainability, we have not identified any specific issues in relation to electrification assets. Network Rail has exceeded three of four condition targets with only the DC contact system recording a condition slightly worse than target, and with long-term trends showing generally stable or improving asset condition.

As with buildings, we consider there are shortcomings in how efficiencies achieved in electrification renewals have been quantified and attributed to PMAs. Network Rail identified PMAs totalling £33.3 million – just over a third of the total efficiencies reported. These largely relate to how it has contracted or delivered packages of work and procured materials. There is a lack of information about how the remaining two thirds, nearly £60 million, of the efficiency that Network Rail has reported on electrification have been achieved.

[12] SCADA – substation control and data acquisition – is a national project to establish central control centres which will remotely monitor electrification assets.
[13] Last year we reported that Network Rail planned to defer work of £103 million from two projects – SCADA and DC LV Switchgear renewals work in Sussex Wessex and Kent – into CP5.

1.6.6 Plant & Machinery

The plant & machinery (P&M) efficiency of £65 million or 40.6% against baseline, is split between a number of different sub-assets. We received efficiency calculations for two sub-assets: depot P&M and signalling, power and communications (SP&C) P&M which together accounted for 80% of the claimed efficiency.

Network Rail has not provided sufficient PMA evidence to support the efficiencies it is reporting in this area. Information has been extremely limited, with only two unquantified examples given of changes made to how SP&C work was contracted and delivered. The depot P&M efficiency of £30 million has been affected by adjustments that have increased the baseline by £25 million for the estimated level of work rescheduled from prior years in CP4, which we consider is likely to have had the effect of overstating the 2013/14 efficiency while understating the level achieved in previous years.

As was the case last year, we cannot provide an opinion on robustness and sustainability of the efficiencies because we have not received any information in this area.

1.7 MUC Confidence Grading Analysis

Our Maintenance Unit Cost (MUC) confidence grading assessment for the codes presented in Statement 14 of the Regulatory Accounts, is **B2**, based on the definitions set out in Appendix F of this report.

Network Rail reports 30 of its 104 maintenance activity codes, referred to as MNT codes, to allow comparison with prior years. There has been considerable improvement in the quality of Network Rail's reported MUCs during CP4, with the exception of last year when it was unable to supply data required for our assessment of accuracy. We have adapted our approach from 2012/13 to enable us to complete our 2013/14 assessment.

Our reliability assessment is based on the control processes which Network Rail has established and the importance it places upon MUC reporting across its business. We have continued to see improvements in 2013/14 including updates to the MUC handbook to improve its usability and making it available on Network Rail's intranet. However, we have been unable to award the top reliability score to Network Rail because the process by which it removed its week 3 data check did not meet best practice. In our opinion, it was undertaken too quickly and the impact was not thoroughly analysed before central finance implemented the change.

We have performed five calculations to determine an overall accuracy rating for each MNT code, as set out in section 8.2. The overall accuracy rating of 2 has remained the same as 2011/12 and 2012/13. However, we have seen a deterioration in the accuracy scores of individual MNT codes, with more attaining a "4" grading and fewer achieving a "1". We believe that this may be due to inaccurate forecasting which demonstrates weaknesses in the overall cost control environment within Network Rail, although we recognise that forecast data does not form part of the MUC calculation. Nevertheless, the deterioration in accuracy compared with 2012/13 is not of a sufficient magnitude to alter the overall accuracy grading; this is based on an average across all MNT codes, and this has

remained within the threshold required for the attainment of an accuracy grading of "2".

1.8 RUC Confidence Grading Analysis

Our Renewals Unit Cost (RUC) confidence grading assessment is based on the definitions also set out in Appendix F. Our work is limited to a high-level recalculation of total expenditure divided by volume as presented in Statement 15.

Network Rail has stated that it considers the scope of this confidence grading assessment should be limited to a review of the high level arithmetic calculation presented in Statement 15, on the basis of which the RUC figures are formulated. Our approach to this confidence grading is therefore focused on the basic RUC calculation, which comprises expenditure divided by volume for each renewals activity.

We have awarded a confidence grading score for the RUCs of **A1** in 2013/14. Both the total cost and the volume figures for each line item are shown in Statement 15, alongside the resulting RUC figure. The clear and simplistic basis of the calculations presented results in a reliability grading of A. In terms of accuracy, Network Rail's calculation of RUC values on the basis of cost divided by volume in Statement 15 has been found to be, in all cases, without error. This results in an accuracy grading of 1.

1.9 Conclusions

As this is the last year of the control period some uncertainties have been removed, mainly around the level and impact of work deferred into CP5 which has had to be formally agreed with ORR. Nevertheless, there are a number of areas where we have either been unable to form an opinion based on the information Network Rail has provided or where we have concluded there are material uncertainties:

- There are material uncertainties around the robustness of maintenance efficiencies, in particular with regard to track and electrification assets. Performance of these assets is below target, and is a cause of increased delay in 2013/14 on seven out of ten routes. For certain categories of maintenance activity relating to track and electrification assets we have not received sufficient evidence that activity levels were sufficient to avoid the shortfall in performance in these asset categories.
- For track renewals, Network Rail's delivered volumes at the end of CP4 for Plain Line remain below target, with a 6.8% shortfall in the CP4 total compared to the target volume based on Network Rail's revised asset policy. Although Network Rail has indicated that delivering Plain Line volumes will be a key priority for CP5, it has acknowledged that there is now a greater sensitivity in CP5 to shortfalls that could adversely affect track condition. We consider there to be a sustainability concern as to how continued volume shortfalls may affect the asset performance of critical routes, given the difficulties Network Rail has faced delivering target volumes throughout CP4.

- Network Rail has 'neutrally' deferred £111 million electrification renewals from 2013/14 into the next control period, i.e. it has neither been reported as "outperformance", nor "underperformance". [14] Information has been provided indicating that the deferral has not had an adverse impact on asset performance (robustness) or sustainability. The ORR has indicated it considers it acceptable for Network Rail to treat this electrification renewals deferral as 'neutral' in efficiency terms, in light of the amended approach to efficiency reporting being applied in CP5.
- For plant and machinery renewals, we have not received sufficient evidence to demonstrate how the reported efficiencies of approximately £65m have been realized, with only two unquantified examples given of changes made to how certain categories of work were contracted and delivered. As was the case last year, we cannot provide an opinion on robustness and sustainability of the efficiencies because we have not received any information in this area.

Our opinion letter that can be found at Appendix G.

1.10 Recommendations

Based on our findings from this year's review, we make the following three recommendations.

Ref.	Recommendation
2014.RA.1	We recommend that if not already planned, Network Rail and the ORR carry out a joint retrospective analysis of the efficiency reporting process during CP4 and its applicability to the new reporting processes around total financial performance in CP5. This should encompass general efficiency reporting principles, agreement at a practical level of how "baseline" values from PR13 can be embedded into detailed reporting models / processes, establishment of relevant frameworks for reporting and independent review, and an appraisal of lessons learned which are to be applied going forward.
2014.RA.2	We recommend that Network Rail reinstates an efficiency reporting model (operating on similar principles to the REEM model) to support the ORR's new measurement of total financial performance throughout CP5. This model should capture and analyse the relevant expenditure, volume and unit cost data underpinning the reported financial efficiencies. The model should be adapted to enable its utilisation at a disaggregated route level in support of the route-level efficiency benefit sharing mechanism (REBS), as well as having the facility to collate figures at a "GB" (network-wide) level.

[14] As defined in the ORR's guidance, "Monitoring and Treatment of Network Rail's Underspend and Efficiency: Policy Statement", January 2006

Ref.	Recommendation
2014.RA.3	We recommend that Network Rail and ORR establish a process for the reporting of year-on-year maintenance efficiency savings that directly links defined positive management actions with quantified volume, unit cost and non-volume cost savings including those areas of expenditure captured through the MUC framework.

Table E4: Recommendations

We have also revisited the recommendations made in Arup's 2010/11 and 2011/12 reviews. For eleven out of the twelve recommendations, no further progress has been made during 2013/14. We note, however, that Network Rail rejected eight of the recommendations, and that after our review of the 2011/12 regulatory accounts, Network Rail indicated that it considered it had addressed the remaining recommendations and that no further action was required. The only progress during 2013/14 has been in relation to our recommendation for Network Rail and ORR to review asset policies and how they influence and shape work banks.

Further details can be found in Appendix B.

2 Introduction

2.1 Background and strategic objective

This report presents the findings of Arup's review of efficiency calculations and expenditure data reported in six specific statements in Network Rail's 2013-14 Regulatory Accounts.

This assignment is part of Arup's role as Independent Reporter ("the Reporter"), providing provisional advice on Network Rail for the Office of Rail Regulation (ORR). It builds on our previous findings and recommendations in this role including reviews of Network Rail's regulatory statements over the past three years (2010/11, 2011/12 and 2012/13) and a number of reviews to support the PR13 determination. This work has been delivered under the Independent Reporter Mandate AO/048: Network Rail 2013/14 Regulatory Accounts, a copy of which is included as Appendix A.

The overall objective of the review was to determine whether the specific regulatory financial statements are accurate and reliable.[15] We have assessed how Network Rail's reporting has changed from previous years, following up recommendations we made in previous years. We have highlighted areas where we believe Network Rail could make further improvements. Our recommendations take into account changes to the efficiency reporting process that will occur for Control Period 5, starting in the 2014/15 financial year.

2.2 Scope

Our mandate was to review of the following sections of Network Rail's 2013-14 Regulatory Accounts:

- Statement 8b – Analysis of maintenance expenditure by MDU;
- Statement 9b – Detailed analysis of renewals expenditure;
- Statement 12 – Analysis of efficiency (Real Economic Efficiency Measure);
- Statement 13 – Volume incentives;
- Statement 14 – Maintenance unit costs; and
- Statement 15 – Renewals unit costs and coverage.

We have focused our review on Statement 12, the Real Economic Efficiency Measure (REEM), and Statement 14, on Maintenance Unit Costs to identify whether Network Rail's breakdown of efficiencies between scope and unit cost is reasonable. In particular we have reviewed the:

- quality and consistency of the data used to calculate the unit costs and efficiency measures,
- robustness of reported efficiency results, and

[15] Our assessment was to determine if the statements were substantively correct rather than completely accurate, a concept which is called materiality.

- transparency of underlying analysis and challenge of efficiency measures, to ensure that Network Rail can explain the numbers that it is reporting.

We have ensured that statements are numerically consistent and accurate for all the statements we have reviewed.

The full scope of our review is set out in the assignment mandate (Appendix A).

We would like to acknowledge the time and effort that Network Rail's staff have put into providing us with supporting information and clarification to support and understand the numbers reported in their statements.

2.3 Approach and methodology

Our review has drawn upon Network Rail's internal documents, relevant spreadsheet data and calculations, and meetings with Network Rail staff. Where appropriate we make recommendations based on our findings, as well as reviewing Network Rail's progress in relation to previous recommendations and issues raised in our previous Reporter reviews.

Expenditure figures and monetary values presented in this report are in 2013/14 prices, unless stated otherwise.

Risk-based approach

Underlying our methodology is a risk-based approach. This means we focus our review of the Regulatory Accounts based on how individual statements are likely to be used for the planning and regulation of Network Rail's business activities, and the inherent risk from an audit perspective that they represent. Areas of data where we perceive there is a high level of audit risk are subject to more detailed auditing and scrutiny. Further details of our risk-based approach are included in Appendix C.

Data consistency

For each of the relevant statements, we have undertaken a desktop review of the numerical consistency of the figures presented in the respective tables, including the breakdown of GB totals between England & Wales and Scotland. We have also checked that figures presented in different statements (e.g. renewals data in Statement 9b) are consistent with figures presented elsewhere (e.g. Statement 12 efficiencies).

REEM efficiency evidence

A central area of focus in our review has been the assessment of the underlying evidence base to support declared efficiencies in Statement 12 of the regulatory accounts. Efficiency is reported through the Real Economic Efficiency Measure (REEM), a measure that compares actual outturn expenditure for 2013/14 with inflation-adjusted 'pre-efficient' baseline (roughly, 2008/09). Our approach to reviewing efficiency evidence focuses on three principal aspects:

- Positive Management Actions (PMAs): the extent to which improvements in efficiency can be traced back to specific actions taken by management.
- Robustness: whether policies and plans can deliver required CP4 outputs.
- Sustainability: if demand on the network were to remain steady, would the application of the same policy (and plans) continue to deliver the outputs specified for the final year of CP4 indefinitely? We interpret this as testing the extent to which stated efficiencies are achieved without risking future adverse impacts on the condition of Network Rail's asset base.

Unit cost confidence grading

Our review of maintenance and renewal unit costs presented in Statements 14 and 15 of the regulatory accounts has involved the assessment of data quality and reliability using the established confidence grading methodology. This involves detailed review of input data quality and calculations, On this basis, an alpha-numeric grading is assigned to each unit cost to reflect our judgement of the:

- reliability of the unit cost reporting process, transparency, and quality controls, and
- estimated accuracy and potential error margin in percentage terms.

A more detailed description of the confidence grading methodology is provided in Appendix F.

Key sources of evidence

Our methodology in undertaking this review has centred on:

- a review of process governance, reporting systems and controls and the extent to which this ensures the reliability and robustness of results presented in the relevant statements, and
- an assessment of the data evidence base and rationale underpinning the results presented and the supporting assumptions, together with the review and validation of data outputs.

Our approach combined a desk-based review of Network Rail's internal documents, a review of spreadsheets used for the calculation of efficiency metrics and meetings with various teams within Network Rail. Findings from these exercises underpin the opinions presented in this report.

Review of Network Rail's internal documents

We have reviewed Network Rail's internal guidance notes and policy statements to understand Network Rail's internal planning and efficiency calculation processes. To assess whether decisions and assumptions made in calculating the efficiency measures are reasonable, we have also requested and received internal records and documentation that Network Rail uses throughout these processes. Appendix E lists all the documentation provided from Network Rail for this review.

Review of the REEM efficiency model

Unlike in previous years, we have not received a copy of the efficiency model that Network Rail uses to calculate the REEM efficiency measure and were only

provided with selected outputs from the model. This means that we have not been able to examine the source data and formulae to assess the consistency and suitability of the calculation methodology.

Meetings with Network Rail

We have held a number of meetings with Network Rail's Financial Control and Asset Management teams, focussing on maintenance and renewals cost efficiencies. By meeting both teams, we have been able to gain an holistic view of the interactions between the efficiency reporting process and the asset management practices, as well as insights into how checks and balances are achieved within the organisation. Appendix D lists all meetings we have held in relation to this mandate.

2.4 Key sources of guidance

Our approach to this review has been informed by the principles and baseline data set out in the following documents:

Source document	Description	Why relevant to our review
ORR PR08 Determination (October 2008)	The document specifies the regulatory outputs Network Rail is required to deliver for the current control period (CP4) and the associated level of funding. This includes efficiencies savings in operations, maintenance and renewals expenditure required from Network Rail, set out in terms of the year-on-cost savings over the course of CP4.	PR08 is the original source analysis from which Network Rail's target efficiency for CP4 is derived. Comparing actual expenditure and efficiency against the PR08 target is an important part of our review.
ORR Regulatory Accounting Guidelines (March 2014)	The Regulatory Accounting Guidelines (RAGs) detail the requirements for Network Rail's annual regulatory accounts reporting. This includes principles underpinning the reporting of efficiency savings in operations, maintenance and renewals expenditure, including in relation to the delivery of required outputs.	Our review of Network Rail's reliability and compliance of efficiency reporting includes reviewing the consistency of REEM calculations and supporting evidence against the requirements set out in the RAGs.
ORR letter to Network Rail, "Success in Control Period 4", (1 March 2011)	Building upon the PR08 determination, the letter sets out in detail Network Rail's output indicators for CP4. In some instances, this includes year-on-year values for specific measures /	This letter encompasses efficiency target numbers updated from the original PR08 analysis to take into account variations in Network Rail's efficiency position at

Source document	Description	Why relevant to our review
	KPIs including train performance measures and asset condition metrics.	the start of CP4. The letter also elaborates on PR08 output requirements by identifying a number of specific KPIs against which output delivery can be monitored during CP4.
ORR letter to Network Rail, "Asset policies", (1 June 2010)	This letter defines two tests, "robustness" and "sustainability", that are utilised by ORR to review Network Rail's asset policies "Robustness: Is it reasonable to believe that the policy can deliver the required CP4 outputs, for England & Wales and for Scotland?" "Sustainability: If demand on the network were to remain steady, would application of the same policy continue to deliver the outputs specified for the final year of CP4 indefinitely?"	We have reviewed Network Rail's justification of reported efficiency savings feeding into the REEM calculation for each asset area in the context of these two tests, to assess whether the savings have been made on a robust and sustainable basis. This ensures our review also takes into account forward-looking issues (i.e. ensuring that savings made historically will not result in future issues / risks, e.g. in terms of output delivery / asset performance / cost incursion).
"Monitoring and Treatment of Network Rail's Underspend and Efficiency Policy Statement", ORR, (January 2006)	This document provides guidance specifically in relation to "underspend" by Network Rail, i.e. expenditure on asset maintenance or renewal that is below the level provided for in the ORR's determination for the given control period.	The relationship between underspend and the delivery of outputs is an important area of focus in our assessment of the sustainability of efficiency savings. Building upon the guidance provided in the RAGs, this document has helped guide how such underspend is treated within the efficiency reporting.
"Reporting to Regulators of Regulated Entities", Institute of Chartered Accountants in England & Wales, (October 2003).	This document provides guidance with regard to "reporting to Regulators of Regulated Entities." Included within this document is guidance relating to materiality, and how this may apply to the assessment and reporting of regulatory accounts.	This has helped guide our assessment of how and when issues identified in Network Rail's efficiency reporting / presented results are flagged as being of material relevance.

Table 1: Sources underpinning the approach and method we used for this review.

2.5 Report structure

This report covers our:

- asssessment of Network Rail's 2013-14 reported efficiencies as presented in Statement 12 including:
    - the approach and governance of the efficiency reporting process (Chapter 3),
    - an overview of the elements of the REEM calculation (Chapter 4),
    - operations expenditure efficiency calculations and supporting evidence (Chapter 5),
    - maintenance expenditure efficiency calculations and supporting evidence (Chapter 6),
    - renewals expenditure efficiency calculations and supporting evidence, by asset type (Chapter 7),
- data quality review and confidence grading analysis of maintenance unit costs (MUCs) presented in statement 14 (Chapter 8),
- data quality review and confidence grading analysis of renewals unit costs (RUCs) presented in statement 15 (Chapter 9),
- assurance review of statements 8b, 9b, 12, 13, 14 and 15 (Chapter 10), and
- supporting data and analysis (Appendix E).

3 REEM efficiency reporting process

3.1 Introduction

In this section we have outlined the process Network Rail used for reporting the 2013/14 REEM efficiency calculations, which form the basis of the regulatory accounts. We have highlighted the similarities and differences in the process from prior years' reviews.

3.2 REEM efficiency handbook

Network Rail's Efficiency Handbook outlines the process for calculating REEM efficiencies by cost category and asset type. The handbook was updated in March 2014 to clarify some aspects of the process – such as how the original PR08 baseline was established - but in substance it remains unchanged from previous years.

As in previous years, we have concluded that the handbook clearly defines and explains the principles for recognising efficiencies under REEM, the basis by which they are calculated and how efficiencies should be supported through PMAs.

Three principles govern how efficiencies are recognised:

- Deferral of work cannot be claimed as efficiency. All business units must be satisfied and able to demonstrate that efficiency claimed is not deferral.
- Business units are required to gather positive management actions taken to achieve efficiency.
- Business units must be able to demonstrate the sustainability of their approach to asset management and cost saving.

3.3 Network Rail's approach to calculating and presenting efficiency results

In previous years we have received Network Rail's REEM efficiency model which provides the detailed calculations underlying the reported efficiencies. However, in 2013-14 we received completed templates for most asset or cost category giving the efficiency calculation, with some supporting information. These summary pages were - for the majority of assets - in pdf format limiting the extent to which we could review the formulae used to calculate the reported efficiencies. We cannot comment upon the completeness and level of detail of the underlying data used in the efficiency templates as we did not receive a copy of the model this year. We also did not receive complete information for plant and machinery, IT and corporate offices, and the 'other' renewals categories or for all controllable opex.

In lieu of reviewing the model, we discussed the process and information sources Network Rail used to complete the efficiency templates with representatives from a number of asset types. Financial analysts working within asset management teams are responsible for identifying the annual efficiency by taking actual

expenditure from the general ledger and comparing to the control period baseline cost for the year, adjusted for agreed changes to delivery.

Baseline information differs for opex, maintenance and renewals expenditure. The opex and maintenance baselines are derived from the expenditure position Network Rail achieved at the end of CP3, adjusted for inflation, changes in where cost is accounted and for HLOS assumptions. The renewals baselines are based on volumes and non-volumes set out in the PR08 pre-efficient determination, with the cost of volume activity derived by applying CP3 closing unit rates, inflated to current prices. Renewals baselines are adjusted for work brought forward or deferred into future control periods.

For the majority of cost categories and asset types only a cost (and no volumes) were agreed in CP4. Delivery volumes were agreed for some opex and maintenance costs, and some categories of track and signalling renewals, against which delivery is reported. These categories report a volume efficiency based on actual or accrued renewals and maintenance activity as reported in Network Rail's asset information systems.

3.4 Governance of efficiency reporting process

Network Rail's central finance team oversaw the REEM reporting process, reviewing the efficiency and PMA information provided by asset management teams. We were told that in 2013-14, the financial controller met with the individual asset teams to review forecast information for the year in December and January with a final review of year-end information occurring in April. These reviews are informal so there were no minutes or other documentation that we could review to understand the issues that were raised in the course of the reviews. We are aware that the signalling team met with central finance on an approximately monthly basis from November 2013 onwards to discuss their efficiencies. There was also a review of efficiency reporting issues between the finance team and Executive Directors in March 2014. Despite these oversight meetings, the reported efficiency on both signalling and track changed during the course of our review. We were not provided with an explanation for these changes. Although the changes were not material, we consider them to have been indicative of instability in the efficiency reporting process.

The maintenance team told us about a number of additional informal reviews that occur of efficiency numbers. For example, each cost centre budget holder has a review of opex with their financial reviewer every period. Efficiencies from each of the ten routes are reviewed on a monthly basis with group accounting and quarterly by the executive team. This is an improvement on past years when the efficiency reporting process was a standalone exercise, rather than being used as part of a routine way to continuously monitor and drive efficiency improvement.

3.5 Efficiency reporting process: Reporter opinion

Network Rail's process for reporting 2013/14 REEM efficiencies has followed the standard process established over the past few years. However, the information Network Rail made available for us to review has been less than in previous years as we were only provided with asset-level summary returns. Network Rail has informed us that it has discontinued usage of its REEM model since the 2012/13 review, because it provided no useful information for Network Rail management

and was only prepared annually for the benefit of Arup's review. This is at odds with Network Rail's stated position in previous years, whereby it supported the usage of its REEM model for the purposes of improving transparency and reliability in the reporting process (as recommended by Arup in our 2010/11 review). We consider that continued utilisation of the model would have made comparison of activity levels and efficiencies between 2013/14 and previous years more straightforward, providing a consolidated overview of activity levels and efficiencies throughout the control period. We also consider that utilising the model effectively could have reduced risks of errors in the REEM calculation (a problem that has recurred again in 2013/14 resulting in late alterations to some of the reported efficiency figures). We note that Network Rail has stated, on the contrary, that utilisation of the model, with its various spreadsheets, would have increased the risks of differences emerging between the different figures rather than reduced it.

We were told of examples where efficiency reporting occurred on a regular basis, indicating that the process has been used in 2013/14 to manage specific asset-level reported efficiencies. However, this process was informal, with no record of actions arising from the review for other assets. Furthermore, the renewals efficiency reporting remains a standalone exercise for the annual regulatory accounts.

Overall, we regard the discontinuation by Network Rail of the REEM model and its treatment of renewals efficiency reporting as a standalone exercise to be a lost opportunity to embed long-term improvement and best practice into its efficiency reporting process. We hope that Network Rail will use the opportunity that replacing REEM with total financial performance reporting in CP5 presents, to embed regular and formal financial performance monitoring within its business. We consider this essential to support effective reporting of efficiency by Network Rail going forward.

This is, in our opinion, a wasted opportunity.

4 REEM efficiency overview

4.1 Introduction

This Chapter provides an overview of the REEM efficiency numbers presented in Statement 12 of the regulatory accounts, which are one of the main areas of focus of our review.

4.2 Headline REEM efficiency figures

The table below shows that Network Rail reported an overall REEM efficiency of 15.5% for 2013/14.[16]

REEM efficiency 2013/14	Baseline (£m)	Actual (£m)	Actual efficiency (£m)	Actual efficiency %
Controllable opex	1,079.9	1,089.7	-9.8	-0.9%
Maintenance	1,333.6	944.9	388.7	29.1%
Renewals	2,941.3	2,490.3	451.0	15.3%
Total	**5,354.8**	**4,524.9**	**829.9**	**15.5%**

Table 2: Headline REEM efficiency numbers for 2013/14.

The reported efficiency differs by expenditure category. Network Rail reported an inefficiency for controllable operating expenditure of -0.9%, which is primarily due to the impact of large provisions accounted for within the central Group function. In contrast, Network Rail is reporting efficiencies for maintenance expenditure of 29.1%. For the largest area of expenditure, renewals, the reported efficiency is 15.3%. More detailed commentary on the efficiency savings in each cost category are provided in Chapters 5 to7.

4.3 REEM efficiency vs. target

Network Rail's reported efficiency of 15.5% in 2013/14 is 8 percentage points less than the target efficiency improvement for this last year of CP4, as shown in the table below.[17] In monetary terms this represents a shortfall of over £400 million.

[16] Figures are presented in 2013/14 prices unless otherwise stated.
[17] ORR target efficiencies for CP4, based on an updated analysis of its original efficiency projections set out in the PR08, are set out in the ORR's letter to Network Rail, entitled "Success in CP4", dated 1 March 2011. They include adjustments where the position at the end of CP3 was different from that assumed in the PR08 determination.

REEM efficiency 2013/14	Actual efficiency %	Target efficiency %	Underperformance (-) / outperformance (+) amount (£k)	Underperformance (-) / outperformance (+) %
Controllable opex	-0.9%	15.3%	-175.0	-16.2%
Maintenance	29.1%	25.5%	48.6	3.6%
Renewals	15.3%	25.2%	-290.2	-9.9%
Total	**15.5%**	**23.5%**	**-416.6**	**-8.0%**

Table 3: Reported REEM efficiency versus target efficiency for 2013/14.

Performance against individual target efficiency levels differed for each cost category. Network Rail underperformed on the efficiencies it expected to achieve on controllable operating and renewals expenditure by 16.2 percentage points and 9.9 percentage points respectively. However, it outperformed, by achieving 3.6 percentage points of efficiency savings more than expected, on maintenance expenditure despite this area requiring the greatest percentage saving during CP4.

The cumulative savings Network Rail was required to achieve during CP4 were actually higher than 21% because it did not achieve the CP3 target efficiencies used by ORR in its determination. To bridge the gap Network Rail needed to achieve 23.5% savings by the last year of CP4, 2013/14.

The figure below shows that, while Network Rail overperformed in the first three years of the control period, achieving higher than target efficiencies, it has underperformed in the last two years. In 2012/13, Network Rail forecast it would achieve an efficiency of 20% in 2013/14, which would have meant a 3.5% shortfall from target at the end of CP4. In the event, the gap between the level of efficiency achieved and its target, widened from a shortfall of 2.8 percentage points in 2012/13 to 8 percentage points in 2013/14.

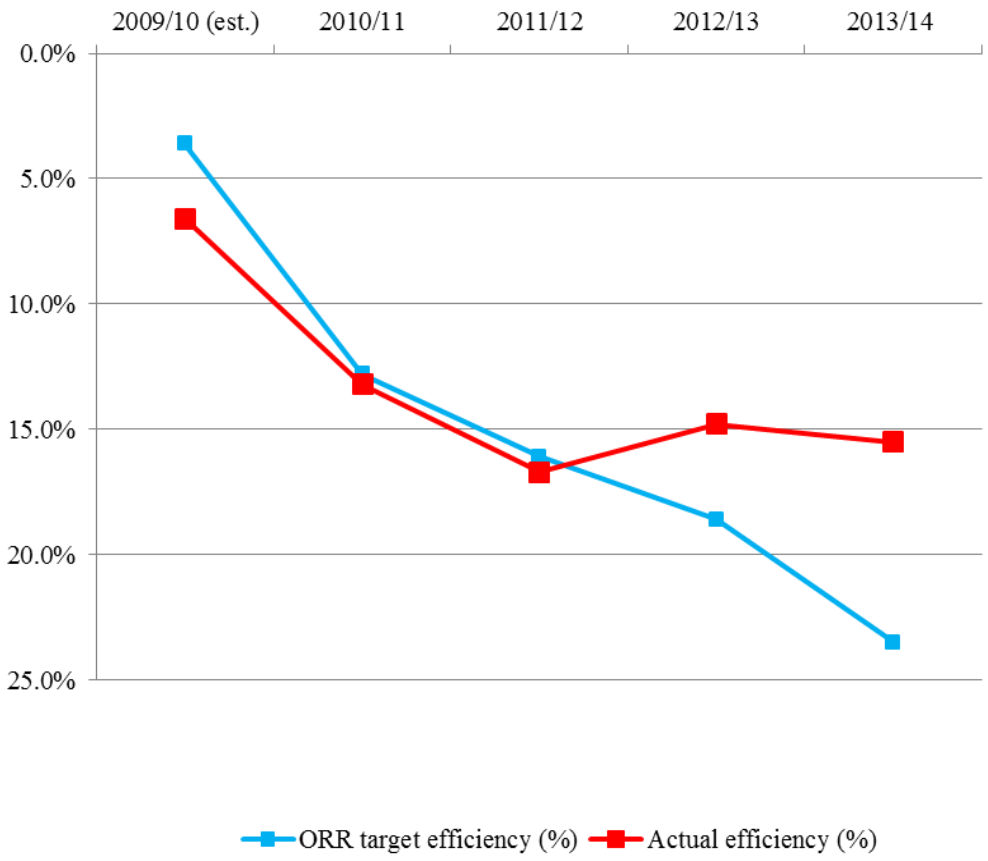


Figure 1: Network Rail aggregate efficiency over CP4

5 Operating expenditure efficiency

5.1 Introduction

Operating expenditure is the only of the three cost categories where Network Rail is reporting an inefficiency in 2013/14, of nearly 1%, as shown in the table below. This is an underperformance against the target of 15.3% efficiency for the year, which equates to an underperformance of £175.0 million in monetary terms. This is the only year in CP4 in which Network Rail has not met or exceeded target efficiencies for operating expenditure.

Operations expenditure efficiency 2013/14	REEM baseline (£m)	2013/14 Actual (£m)	2013/14 Efficiency (£m)	% Efficiency
O&CS	501.7	475.1	26.6	5.3%
Support	578.2	614.5	-36.4	-6.3%
Total	**1079.9**	**1089.7**	**-9.8**	**-0.9%**

Table 4: Operating expenditure and efficiency overview

5.1.1 Operations & Customer Services (O&CS) efficiency

O&CS costs achieved an efficiency of 5.3% (Table 5), marginally lower than the 5.9% which Network Rail reported in 2012/13.

Operations and Customer Service (O&CS) efficiency 2013/14	REEM baseline (£m)	2013/14 Actual (£m)	2013/14 Efficiency (£m)	% Efficiency
Unit costs	394.8	385.3	9.5	2.4%
Other direct costs	22.1	30.9	-8.8	-39.8%
Indirect opex	84.8	58.9	25.9	30.5%
Total	**501.7**	**475.1**	**26.6**	**5.3%**

Table 5: OC&S expenditure and efficiency overview

- The £9.5 million unit cost efficiency comprises volume savings of £19.7 million and a unit cost inefficiency of £10.2 million.
- Expenditure on 'other direct costs' was higher than baseline resulting in an inefficiency of £8.8 million. However this was offset by larger efficiencies in unit costs and indirect operating expenditure.

  With regard to indirect opex, no further detail has been provided on specific PMAs driving the £26m of reported efficiencies.

5.1.2 Support opex efficiency

Support costs reported an inefficiency of £36.4 million in 2013/14, as shown in Table 6 overleaf.

Support cost efficiency 2013/14	REEM baseline (£m)	2013/14 Actual (£m)	2013/14 Efficiency (£m)	% Efficiency
Asset Management	101.2	139.4	-38.3	-37.8%
Property	99.4	108.4	-9.0	-9.1%
Human Resources	82.0	62.3	19.7	24.0%
Group	-0.5	126.4	-126.9	Inefficient
Information Management	76.3	58.9	17.4	22.9%
Finance	31.7	21.0	10.7	33.7%
Government & Corporate Affairs	28.6	18.3	10.3	35.9%
Business Services	14.6	13.9	0.7	5.0%
Safety & Compliance	2.6	14.6	-12.0	-454.2%
Network Operations - Asset Management	15.7	8.1	7.6	48.2%
Contracts & Procurement	52.8	9.2	43.6	82.6%
Planning	6.5	-	6.5	100.0%
Network Strategy	7.2	13.3	-6.1	-85.8%
National Delivery Service	19.2	3.5	15.7	81.8%
Legal Services	3.0	4.9	-1.8	-60.0%
Other Corporate Services	17.8	3.5	14.3	80.2%
Investment Projects	20.1	-3.2	23.3	116.2%
Route Services	-	12.1	-12.1	Inefficient
Total	**578.2**	**614.5**	**-36.4**	**-6.3%**

Table 6: Support costs expenditure and efficiency overview

As can be seen six areas account for 85% of spend – Asset Management, Property, Human Resources, Group, Information Management and Finance. Three of these areas have reported inefficiency. Network Rail provided us with a reconciliation which provides details of the main cost items comprising the largest inefficiency of £126.9 million reported under Group. The main items are a £63 million redundancy provision and a £76.5 million provision for the fine that ORR levied because Network Rail did not achieve performance targets in 2013/14. The regulator confirmed that the fine would be £53.1 million on 7 July 2014, and Network Rail has agreed to use the remainder on initiatives to improve performance.

The reconciliation also shows that costs have been reclassified, including from Planning to Network Strategy, and from Finance and HR functions to Route Services. The impact of these transfers is neutral within overall operating expenditure.

5.2 Efficiency evidence: Positive Management Actions

5.2.1 O&CS PMAs

Network Rail provided a brief narrative description of eleven initiatives that have resulted in total efficiency savings of £26.8 million, slightly more than the overall reported efficiency for O&CS. Six of the initiatives, totalling £7.2 million, relate to organisation rationalisation and increasing productivity resulting in reduced headcount, lower overtime and enhanced hours. The single largest efficiency of £10.1 million relates to savings from signal box closures.

5.2.2 Support cost PMAs

We were provided with initiatives leading to savings for six cost areas[18], including half of the six areas of highest expenditure. The reported savings seem reasonable, although it has not been possible to carry out more than a qualitative review from the information provided. Many of the savings relate to transfer of staff to other areas of the business and overall headcount reduction, such as a reduction of 52 staff in information management. In addition, some reported savings arose from renegotiating with suppliers and cancelling some contracts.

5.2.3 Operations expenditure efficiency: Reporter opinion

PMAs

We consider the evidence provided to support operating cost efficiencies is reasonable.

Robustness and sustainability

We consider there is a low risk that savings in operating costs will have an impact on infrastructure performance or the long-term sustainability of assets. Efficiency savings and inefficient charges largely relate to administrative and central functions which do not typically have a direct impact on asset condition and capability.

[18] The six areas were Human Resources, Information Management, Finance, Governance and Corporate Affairs, Safety and Compliance and Planning/Network Strategy.

6 Maintenance efficiency

6.1 Introduction

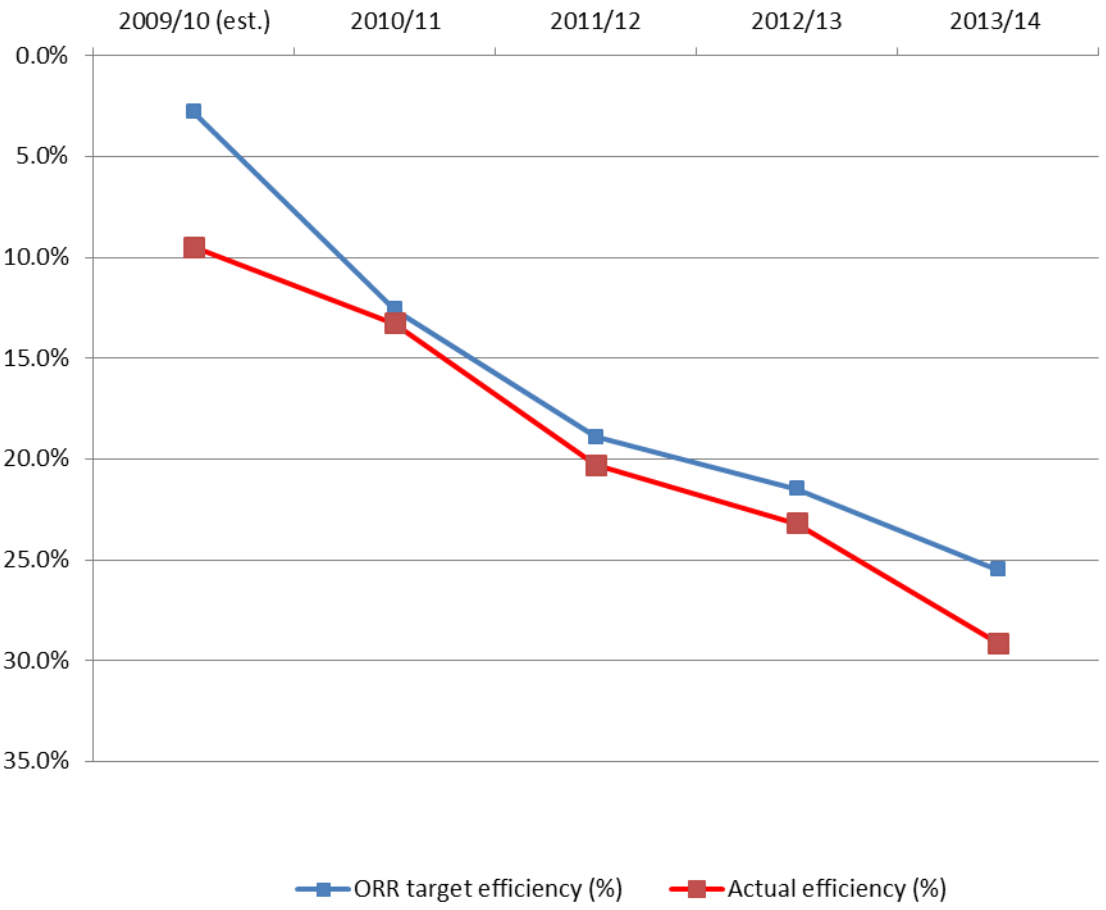
Network Rail is reporting an efficiency of £388.7 million, 29.1%, in 2013/14 on expenditure of just under £1 billion as shown in Table 7. The baseline which expenditure is measured against is the level of spend in the last year of CP3 (2008/09) inflated to current prices, and adjusted for items transferred to different account areas.

Maintenance expenditure, (2013/14 prices)	2012/13	2013/14
REEM pre-efficient baseline (£m)	1,331.4	1,333.6
Actual expenditure (£m)	1,022.4	944.9
Efficiency (£m)	**309.0**	**388.7**
Efficiency (%)	**23.2%**	**29.1%**

Table 7: Maintenance expenditure and efficiency overview

Network Rail has exceeded the regulatory target for efficiencies in each year of the CP4, with the relative level of outperformance increasing to 3.6% from 1.7% when comparing 2013/14 to the previous year (Figure 2). This means that Network Rail made £48.6 million of efficiency savings above target.

Figure 2: Maintenance efficiency against target for CP4



6.2 Maintenance efficiency breakdown

Network Rail has provided a breakdown of its efficiencies according to volume, unit cost and non-volume, which are all activity-based savings, as shown in Table 8.

Maintenance efficiency 2013/14	REEM baseline (£k)	2013/14 Actual (£k)	2013/14 Efficiency (£k)	% Efficiency
MUC (volume-related) total	717.9	622.8	95.1	13.2%
- of which, volume efficiency	-	-	-83.4	-11.6%
- of which, unit cost efficiency	-	-	178.5	24.9%
Other direct maintenance (non-volume)	421.3	179.5	241.8	57.4%
Other maintenance costs outside the maintenance function (non-volume)	194.5	142.6	51.8	26.6%
Total	**1,333.6**	**944.9**	**388.7**	**29.1%**

Table 8: Maintenance efficiency breakdown by volume, unit cost and non-volume items

On MUCs, it is reporting an inefficiency on volume but a greater efficiency on unit costs. Network Rail changed its MUC framework during CP4, amending and increasing the number of codes that against which it reports expenditure. The baseline against which efficiencies are measured is derived unit costs reported at the end of 2011/12 (rather than 2008/09). This change was made so that they more accurately reflect the true cost of the activity in question. However, as a consequence of this and changes to the overheads attributed to MUCs, Network Rail cannot provide details of PMAs on an activity basis compared to 2008/2009 (the control period baseline) which have led to efficiency savings.

Network Rail has also provided a breakdown of its maintenance efficiencies according to resource. As shown in Table 9 overleaf, the largest monetary saving of £236.8 million has been on labour, while the largest saving compared to spend is on 'other' costs both inside and outside the maintenance function.

Maintenance costs & efficiency (2013/14 prices)	Baseline (2008/-09) (£k)	2013/14 Actual (£k)	2013/14 Efficiency (£k)	2013/14 Efficiency (%)
Labour	831.0	594.3	236.8	8.2%
Plant & Vehicles	175.0	130.2	44.8	8.9%
Materials	92.8	68.7	24.1	9.4%
Other	39.1	9.1	30.0	79.1%
Sub-total	**1138.0**	**802.3**	**335.6**	**29.5%**
Other maintenance costs outside the maintenance function	194.5	142.6	51.8	26.7%
Accounting adjustments after our review	1.2	0.0	1.2	-
Total	**1333.6**	**944.9**	**388.7**	**29.1%**

Table 9: Maintenance efficiency breakdown by expenditure type

Within the category of 'other maintenance costs which sit outside the maintenance function', Network Rail efficiencies are largely derived from accounting adjustments. They include an annual provision for changes to maintenance staff terms and conditions (made in consultation with ORR) since 2009/10, which has not been required, and recharging by the National Delivery Service to renewals activity areas.

6.3 Maintenance efficiency evidence: Positive Management Actions (PMAs)

Network Rail has attributed 90% of its maintenance efficiencies to specific PMAs, as shown overleaf. We have attributed these efficiencies to specific resources where possible.

2013/14 Positive Management Actions according to resource	Estimated efficiency (£m)	% of total maintenance efficiency
Labour		
Capex works maintenance delivery teams, where 1,752 staff have moved from opex to capex activities	89.1	23.0%
Phase 2bc, restructuring to standardised work practices and rosters allowing a net headcount reduction of 1,624 during CP4	58.6	15.1%
Overtime control, which is monitored weekly at area level and monthly at route level	22	5.7%
Reliability centred maintenance, adjusting cyclical maintenance of signalling assets, based on usage and environment	5.4	1.4%
Plant & Vehicles		
New rail management equipment, providing unit cost savings on welding repairs	12.3	3.2%
Road vehicle management	7.4	1.9%
Small plant management - acquisition of plant previously hired	4.6	1.2%
Vehicle trackers resulting in a reduced vehicle tax benefit liability	3.3	0.9%
Maintenance campaigns, using new equipment to achieve savings on vegetation clearance and transportation of materials to site	1.1	0.3%
Material		
Recycled material - savings on rail, wooden sleepers, concrete and steel by reducing materials orders	0.5	0.1%
Efficiencies that cannot be attributed to a single resource		
Other local and national management actions	143.0	36.9%
Efficiencies not attributed to a PMA	40.2	10.4%
2013/14 Efficiency	**387.5**	**100.0%**

Table 10: Maintenance PMAs resulting in efficiency savings

As indicated above, the largest PMA category is "other local and national management actions", from which Network Rail calculates £143m of efficiencies. Although Network Rail has informed us that locally-driven initiatives are too numerous to list, we have been provided with the same route-based examples of initiatives as last year from Kent, East Midlands, Wessex and LNE. We acknowledge that many of the initiatives have generated savings which carry over into this financial year, and estimate that the savings for 2013/14 from the examples given are approximately £9 million (6% of the £143.0 million efficiency).

The next two most significant PMAs listed relate to the organisational restructuring and headcount reduction (contributing to the overall £237 million of labour savings referenced above). Network Rail reports £89 million efficiency

relating to the transfer of some 1,750 staff to "Capex works maintenance delivery teams", and their associated costs, from opex to capex activities, with a further £59m of savings attributed to "Phase 2bc" restructuring with resultant headcount reductions. Network Rail has provided details of the headcount reduction calculations from which these numbers are derived.

PMA detail has also been provided for eight further categories (sub-categories into labour, plant & vehicles and material management measures), collectively accounting for ca. £57m of the efficiency total. However, there remains a considerable value of efficiency savings – ca. £40m – which Network Rail is unable to link to any specific activities or initiatives.

6.4 Maintenance efficiency evidence: robustness and sustainability

Network Rail provided us with asset stewardship and reliability information, with the aim of demonstrating that its maintenance efficiencies have not adversely affected current performance (to demonstrate "robustness"), nor put the long-term condition of assets at risk (to demonstrate "sustainability").

6.4.1 Asset sustainability indicator

Network Rail's overall asset indicator, weighted for component assets[19], has shown a general increase over the control period which suggests that the combined effect of maintenance and renewals efficiency savings are not risking the long-term condition of its assets. In 2013/14 the indicator was above target at both the start and end of the financial year but dropped below target during the middle of the year. Key contributing factors to the decrease mid-year are the telecoms asset indicator as a result of ongoing problems with GSM-R system, which we comment upon in more detail in section 7.7.4. Network Rail also reported that an improvement in rail defect testing in rural and Scottish lines resulted in a 'bow wave' of reported defects in the early part of the year, reducing the track indicator. A marked improvement in the indicator for civils/structures, which we have not reviewed in detail because they are excluded from the REEM calculation, resulted in the overall improvement at year end.

6.4.2 Asset reliability measures

Performance against asset reliability measures, however, shows a much more mixed picture. While Network Rail reported that the number of infrastructure failures has fallen by 9 per cent over CP4, incidents have increased over 2013/14. Most notably, there has been a 6.7 per cent increase in track-related incidents compared to 2012/13, as shown in Table 11 overleaf. Telecoms failures have also increased significantly during the year but, as we discuss in section 7.7.4, these are largely related to the GSM-R renewals programme. The delay per incident has increased over the control period.

[19] The indicator is weighted 40% track, 25% signalling, 10% electrification and power, 10% operational property, 10% structures and 5% telecoms.

Delay attribution incidents	2012/13 incidents	2013/14 incidents	Difference	Percentage change
Track				
104A TSRs due to condition of track	658	726	68	10.3%
104B Track faults including broken rails	4660	5237	577	12.4%
106A Track patrols & related possessions	2213	2074	-139	-6.3%
Signalling				
101 Points failures	5022	4387	-635	-12.6%
103 Level crossing failures	1858	1939	81	4.4%
301A Signal failures	4158	4091	-67	-1.6%
301B Track Circuit failures	3901	3736	-165	-4.2%
301C Axle Counter failures	706	800	94	13.3%
302A Signalling system & power supply failures	4495	4674	179	4.0%
302B other signal equipment failures	1520	1458	-62	-4.1%
Electrification				
201 Overhead line/third rail faults	1264	1242	-22	-1.7%
Telecoms				
303 Telecoms failures	1504	2338	834	55.5%
304 Cable faults (signalling & comms)	614	687	73	11.9%
Total	32573	33389	816	2.5%

Table 11: Network incidents recorded for delay attribution for specific infrastructure assets.

The table overleaf gives performance in 2013/14 against ten measures Network Rail has indicated in prior years' reviews were directly impacted by maintenance activities. It has not achieved the target level for six of the ten measures. [20]

[20] Network Rail has highlighted that, notwithstanding the shortfall in these measures compared to target, it has made significant reliability improvements since the end of CP3, with, for example, track circuits improving by 28%, points failures improving by 45% and signal failures by 31%.

Asset measure	Actual performance in 2013/14	"Success in CP4" target for 2013/14	Achieved in 2013/14?	*Achieved in 2012/13?*
Good Track Geometry	137. 7%	137.6%	Y	*Y*
Poor Track Geometry	2.32%	2.34%	Y	*N*
Geometry Faults /100km	36.51	35.90	N	*N*
Broken Rails & Serious Rail Defects / 100km	3.97	5.60	Y	*Y*
Track Faults	5,980	6,238	Y	*Y*
Signalling Failures >10 mins	14,957	13,614	N	*N*
Points Failures	4,387	2,871	N	*N*
Track Circuit Failures	4,538	3,857	N	*Y*
Power Incidents >300 mins	85	77	N	*Y*
Telecoms failures >10 mins	1,280	644	N	*N*

Table 12: Actual asset measures against target for 2013/14

Note to table: Targets for 2012/13 are different to 2013/14 because ORR's "Success in CP4" required a year on year improvement in performance over the control period.

6.4.3 Linkage between maintenance programme and shortfall in delivery of outputs

Network Rail missed nine out of its ten regulatory targets[21] for train punctuality and reliability in 2013/14. Where Network Rail has claimed efficiencies, it is required by the regulatory accounting guidelines,[22] to demonstrate that it has not compromised long-term asset condition, performance of the network or delivery of regulated outputs.

We consider in the sections that follow the evidence that Network Rail submitted to ORR to explain why performance was not achieved during 2013/14, to identify whether infrastructure failures, which could be due to maintenance or renewals efficiencies, have been a contributing factor.

Performance causal analysis

The evidence we received focuses on England and Wales, for which PPM was 89.8% on average, against a target of 92.6%. The target for Scotland of 92.0% was missed by 0.6%. The targets report all delay, including those caused by operators. Network Rail-caused delay, which includes external factors such as the weather and trespass on the network, had the largest variance between planned

[21] These are PPM, CaSL and delay per train km measures.
[22] For CP4, the NR Underspend and Efficiency Policy 2006 applies

and actual delay in year. Network Rail has attributed this to the impact of the weather. Nevertheless, three of the following four factors which Network Rail identified as causing the targets to be missed in 2013/14 are related to its management of the infrastructure:

- prolonged winter sequence of storms, flooding (both from rivers and groundwater), wind related disruption, tidal surges;
- prolonged autumn with performance not to the level expected;
- worsening reactionary delay and delay per incident, which includes infrastructure failures; and
- specific (transient) problems:
    - possession overruns (related to increased infrastructure enhancements and renewals workload);
    - traincrew problems for some operators driving material impact on cancellations and CaSL at LD and Regional Sector level;
    - increasing operator on operator delays, partly disproportionate to the rise in operator on self delays,
    - slowing in reduction in infrastructure failures, with particular spike in telecoms incidents due to teething problems introducing GSM-R, and
    - major programme to reduce TSRs interrupted by 'worsenment' caused by waterlogged formation.

While Network Rail has identified that extreme weather was one of the main factors for missing its PPM target, we believe that it could have factored the impact of adverse weather into its CP4 plans. In the 2008 Strategic Business Plan, Network Rail reported that its baseline contained its forecast impact of weather-related factors and it believed it would get better at managing these events. In contrast, Network Rail, in explaining its estimate of the impact of weather events as decreasing PPM performance by 0.9%, stated that its CP4 assumption was that the weather would remain as in CP3 when, in reality, it has worsened.

In its 2014 Annual Return,[23] Network Rail identified that infrastructure failures were a factor in delay being worse than the last year on seven out of ten routes. The three routes where infrastructure was not cited as a factor are Western, Wessex and Sussex. Track-related faults were a cause of increased delay on LNE, Kent, Anglia and Cross Country routes. Signalling faults, including axle counter, track circuit and points failures, were a cause of delay on LNW, Kent, Wales, Cross Country and Scotland. Extreme weather was cited as a factor on just six of the ten routes, with other routes reporting a lower impact than in 2012/13.

Linkage with volume efficiency savings

We have reviewed volume efficiencies across the different areas of maintenance activities, to assess areas in which a potential linkage may (or may not) exist between levels of maintenance activity and the delay-causing asset failures contributing to Network Rail's overall performance output shortfalls discussed earlier in this chapter.

[23] We reviewed the draft Annual Return dated 1 July 2014.

Maintaining the rail infrastructure encompasses a wide range of activities. Around two thirds of Network Rail's maintenance 2013/14 spend is broken down in volume and unit cost terms. As stated previously, Network Rail has not been able to give a volume and unit cost breakdown of 2013/14 maintenance spend compared to the 2008/09 baseline due to changes to the MUC framework. Network Rail is however reporting changes in volume and unit cost against a revised baseline year of 2011/12. Network Rail is reporting in aggregate terms a volume inefficiency for 2013/14 on this basis, with delivered volumes generally higher than in 2011/12. However, there are many maintenance activities on individual assets that report volume efficiencies (i.e. reduced volumes) even though these are more than offset in cost terms by maintenance categories in which volumes have increased.

As discussed in Section 6.4.2, Network Rail is falling short of regulatory targets in relation to failure rates for a number of track-related assets. Significant cost savings feeding into the total maintenance saving can be identified from reductions in certain key track-related maintenance activities.[24] Overall, the impact of volume savings in these areas is, in net terms, £35m. [25] We consider there to be material uncertainty in relation to this efficiency amount, in light of the performance shortfalls being experienced.

For maintenance activities relating to electrification assets, Network Rail is reporting volume inefficiencies (i.e. higher activity volumes) of £69m compared to the revised maintenance baseline (2011/12). In light of the failure rate for power incidents causing delays greater than >300 minutes being above the target level, it is not clear to what extent this may understate the level of inefficiency,

[24] As indicated at the start of this chapter, Network Rail has not provided a full breakdown of volume and unit costs savings under the MUC framework for this year's REEM. However, we have been able to combine savings reported under the "new" MUC codes between 2011/12 and 2012/13, with cost savings between 2008/09 and 2011/12 reported in last year's REEM, to make an aggregated estimation of overall savings in particular activity areas.

[25] Our estimation of the £35m net savings is based on a combination of:

- £54m of track-related volume savings associated with the following eight activity categories:
  - S&C Tamping £13.1m volume efficiency
  - S&C Unit Renewal £12.1 m volume efficiency
  - Installation of pre-fabricated IRJs £7.5 m volume efficiency
  - Manual Spot Re-sleepering £7.5 m volume efficiency
  - Replacement of Pads & Insulators £5.4 m volume efficiency
  - Track Circuits / Train Detection Services £3.1 m volume efficiency
  - Replacement of S&C bearers £2.8 m volume efficiency
  - Mechanical Wet Bed removal £2.3 m volume efficiency
- Combined volume increases driving £19m additional spend in eight other track-related maintenance categories, which comprises:
  - Maintenance of Rail Lubricators +£7.7m additional spend
  - Inspections (fencing, vegetation, drainage) +£5.2m additional spend
  - Drainage +£2.2m additional spend
  - S&C weld repairs +£1.5m additional spend
  - Point End Routine Maintenance +£1.4m additional spend
  - Fences and Boundary Walls +£0.6m additional spend
  - Manual Wet Bed removal +£0.4m additional spend

In net terms this results in a saving of £35m.

i.e. whether further increases in activity vs. baseline could have led to the shortfall in required performance being avoided.

For telecoms assets, we consider the above-target failures rates to be mainly the result of issues in the FTN renewal programme as opposed to telecoms-related maintenance. We discuss FTN renewals efficiencies further in Section 7.6.

6.4.4 Reporter opinion

PMA Evidence

The PMA evidence we have received to support the maintenance efficiency remains incomplete in terms of detail, and limited in terms of its explanation relative to cost savings. Although Network Rail has provided a breakdown of the efficiencies both by resource type, and according to a list of PMAs, the level of detail provided is limited. The bulk of savings are the result of organisational restructuring and rationalisation, with headcount reductions and staff transfers to other divisions driving the savings.

As was the case last year, Network Rail has not been able to give a breakdown of 2013/14 maintenance spend versus baseline (2008/09) by volume and unit cost, due to changes to the MUC framework. As a result, there is an absence of any visible connection between PMA measures described and the quantified activity levels and unit cost reductions resulting in cost savings.

The evidence base used to support the maintenance has been largely the same as last year (with some supporting material directly re-used), and there has been no improvement in the level of detail or analysis provided.

Robustness and sustainability

We consider that there is material uncertainty regarding the robustness of maintenance efficiencies, particularly with regard to track, signalling and electrification assets.

Network Rail did not meet nine out its ten regulatory train performance targets in 2013/14. It has identified that extreme weather and traffic growth were the largest contributors to exceeding the regulated delay measures. However, it acknowledges that increased reactionary delay due to infrastructure failure and failure rates higher than forecast were also contributing factors. The number of infrastructure incidents leading to delay has increased overall between 2012/13 and 2013/14, with total delay minutes increasing as a result. These causes can be directly influenced by maintenance activity and could be adversely affected by maintenance efficiencies.

Based on our analysis of underlying asset reliability measures and regulatory targets, we consider that there is uncertainty regarding the robustness of volume efficiencies that have contributed, in net terms, £35m of savings. We also consider note, in relation to electrification assets, that volume inefficiency of around £69m, may understate the level of inefficiency, in light of electrification-related delay incidents in excess of target levels.

We would require further evidence and analysis to be able to quantify the impact of the levels maintenance activity in different areas and the extent to which they may have led to performance failures and therefore should not be claimed as efficiency. In particular we require further information of how non-volume maintenance activities have been achieved.

In spite of the robustness issues described above, from a long-term sustainability perspective the weighted asset indicator, which provides a measure of the long-term condition of infrastructure assets, has shown a general trend of improvement during the control period, which suggests there are no significant sustainability risks.

7 Renewals efficiency

7.1 Introduction

This chapter presents our review of the renewals efficiencies, calculated through REEM and reported in Statement 12. This is one of the main areas of focus for our review of the Regulatory Accounts, because we consider that it represents a material area of risk in terms of impact on network performance and long-term sustainability. Renewals work also accounts for more than half of expenditure in the REEM calculation.

For each asset area we report expenditure against the REEM baseline and the most up to date plan. We also provide our assessment of the evidence presented for how efficiencies were achieved and their possible impact on the robustness and long-term condition of the asset.

7.1.1 Headline efficiency calculation

Network Rail reported an efficiency of £451.0 million, 15.3%, on renewals expenditure which was greater than reported last year, as shown in Table 13.

Renewals expenditure, (2013/14 prices)	2012/13	2013/14
REEM pre-efficient baseline (£m)	2,475.7	2,941.3
Actual expenditure (£m)	2,108.1	2,490.3
Efficiency (£m)	**367.6**	**451.0**
Efficiency (%)	**14.8%**	**15.3%**

Table 13: Renewals expenditure and efficiency overview

However, the reported efficiency was nearly 10 percentage points below the target for 2013/14, as shown in the table below. The underperformance against target represents a monetary shortfall in efficiencies of £290.2 million.

Renewals efficiency, (2013/14 prices)	2013/14
Actual efficiency	15.3%
Target efficiency %[26]	25.2%
Underperformance (-) / outperformance (+) %	**-9.9%**
Underperformance (-) / outperformance (+) amount (£m)	**-290.2**

Table 14: Renewals REEM target against actual efficiency

Despite achieving a higher percentage efficiency saving than last year, the gap between target and actual efficiency has widened in 2013/14, because the target required year on year improvement, as illustrated in Figure 3 overleaf.

[26] Set out in the letter from ORR (Bill Emery) to David Higgins (Network Rail), "Success in control period 4", 1st March 2011, p.4

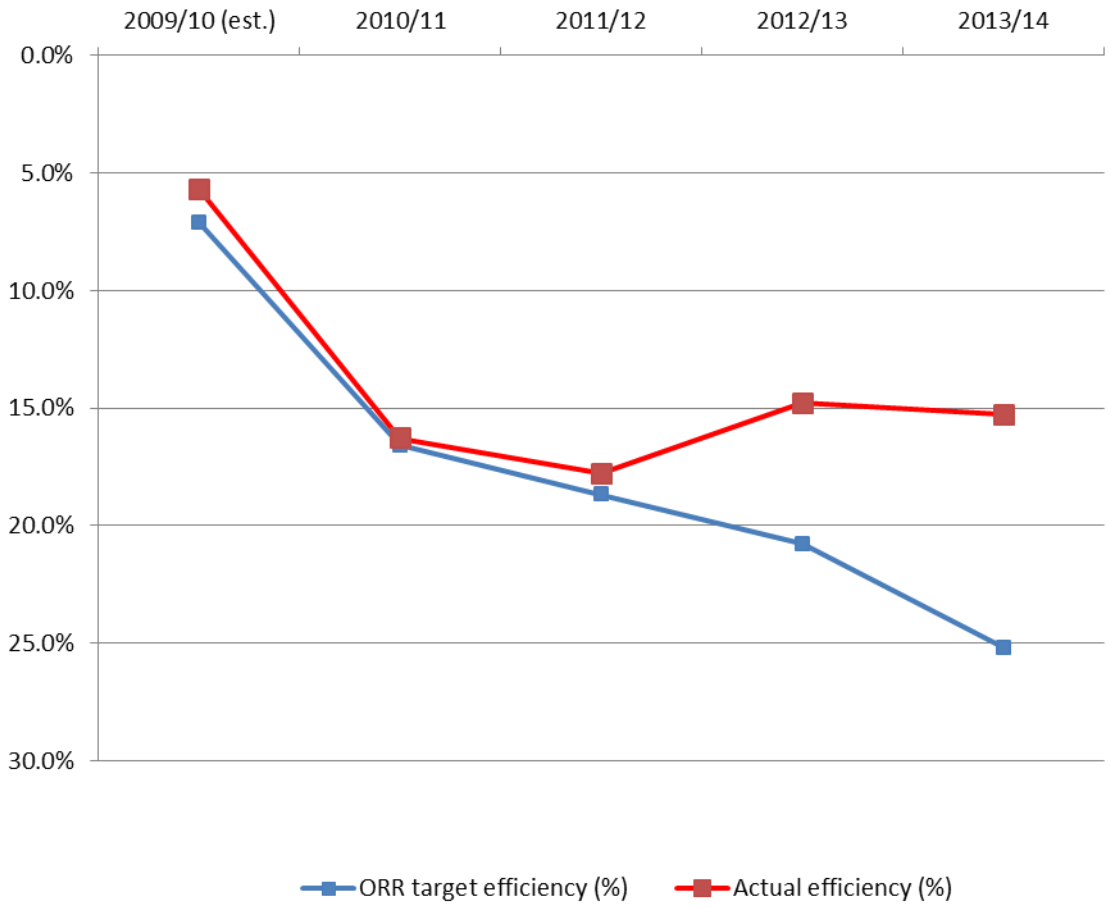


Figure 3: Renewals actual efficiency against target for CP4

7.1.2 Efficiency breakdown by renewal asset category

As shown in the table overleaf, three assets – track, signalling and electrification – account for over half of the renewals efficiency savings reported in 2013/14.

Renewals efficiency by asset category	REEM baseline (£m)	2013/14 Actual (£m)	2013/14 Efficiency (£m)	% Efficiency	Estimate of percentage efficiency attributed to PMAs (%)	Report section
Track	1,110.4	1,012.4	98.0	8.8%	100%	7.3
Signalling	619.1	541.3	77.8	12.6%	100%	7.4
Civils	*Not included in 2013/14 REEM calculation*					
Operational property	314.4	260.8	53.6	17.1%	100%	7.5
Electrification	270.4	177.3	93.2	34.4%	36%	7.6
Telecoms	146.5	105.7	40.8	27.9%	86%	7.7
Fixed Telecom Network	76.9	92.2	-15.4	-20.0%	0% - none provided for 2013/14	7.8
Plant & Machinery	160.2	95.1	65.1	40.7%	0% - PMAs not quantified	7.9
IT & Corporate Offices	137.1	120.6	16.5	12.0%	71%	See below
Other	106.3	84.9	21.4	20.2%	0% - No information supplied	See below
Total	**2,941.3**	**2,490.3**	**451.0**	**15.3%**		

Table 15: 2013/14 REEM renewals efficiency breakdown by asset category.

Note to table: Network Rail agreed with ORR in 2012/13 that Civil assets would be excluded from the REEM Efficiency Calculation.

We review the efficiency calculations and supporting information for individual assets below. We comment on all asset categories apart from IT and Corporate Offices, and the Other category. For IT and Corporate Offices we were provided with information supporting £11.8 million IT hardware, software and system integration capital expenditure efficiencies. We were not provided with supporting calculations so are unable to comment in detail on the saving achieved by IT relative to expenditure on Corporate Offices, how the baseline has changed relative to plan, and whether there are any deferrals into CP5. We were not provided with information to support the efficiency numbers within the Other category.

7.2 Track renewals efficiency

7.2.1 Track efficiency calculation

Track is the largest renewals expenditure category, representing approximately 40% of the actual renewals expenditure in 2013/14. Network Rail is reporting an efficiency of £98.0 million (8.8%) on the asset, as shown in the table below. This is lower than the level of efficiency Network Rail has reported in previous years in CP4.

Track efficiency, (2013/14 prices)	2012/13	2013/14
REEM pre-efficient baseline (£m)	935.1	1110.4
Actual expenditure (£m)	803.7	1012.4
Efficiency (£m)	131.4	98.0
Efficiency (%)	14.1%	8.8%

Table 16: Signalling renewals expenditure and efficiency overview.

Network Rail has changed its efficiency numbers twice from those we initially received for our review. These changes were due to an error within the baseline calculation for plain line track, and a change in reported volume for switches and crossings (S&C).

7.2.2 Track expenditure vs. plan

As seen in table 17 below, during 2013/14Network Rail overspent against its budget for the delivery of track renewals, reflected in the 2013 Strategic Business Plan, by £175m. This can be partly attributed to the inefficiency of £73m from non-volume related activities, as well as Network Rail's push to deliver volumes to compensate for shortfalls earlier in the control period. Figures for the full CP4 control period show a similar shortfall of £173m in total against the 2013 SBP budget figures/in CP4. Network Rail has not reported any planned deferral of track renewals expenditure into CP5 in spite of total Plain Line volumes delivered remaining below target (discussed further below).

Total Track Renewals Expenditure, £m (2013/14 prices)	2013/14	CP4 Total	Planned deferral of total CP4 spend into CP5
CP4 ORR Determination	-	4,868.0	-
2010 CP4 Delivery Plan	745.0	3,986.7	-
Strategic Business Plan 2013 (budget)	837.6	3,861.7	-
Actual Outturn	1,012.4	4,035.0	-

Table 17: Total track renewals expenditure

When reviewing the cumulative profile of expenditure over the full control period, it is apparent that there have been variations in track renewals expenditure, as seen in the chart below. The original CP4 delivery plan (published in 2009) envisaged a fall in year-on-year expenditure. However, track expenditure increased from 2010/11 onwards in response to delayed deliveries in the first two years. The particularly steep increase in expenditure in 2013/14 represents Network Rail's push to meet CP4 delivery targets.

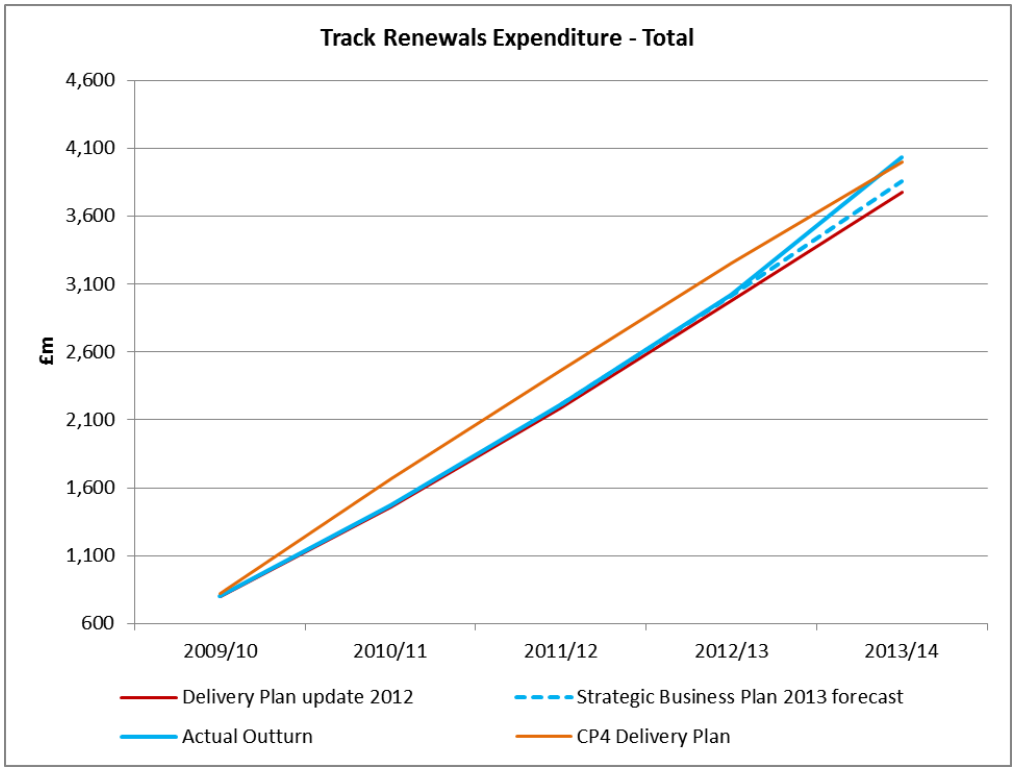


Figure 4: Cumulative track renewals expenditure by plan, outturn and forecast for CP4.

7.2.3 Efficiency breakdown by volume and cost

The table overleaf demonstrates the track efficiency breakdown contained within Network Rail's REEM calculation. We have not received the updated figures to align with Network Rail's revised efficiency of £95.9 million, down from £99 million. Therefore, we are unable to comment accurately on the breakdown of efficiency in relation to plain line, S&C and non-volume efficiencies as we are uncertain where this decrease in efficiency sits.

Track renewals 2013/14	Volume efficiency	Unit cost efficiency	Non-volume efficiency	Total efficiency
Plain Line				
Efficiency (£k)	£118	-£48	n/a	£71
Efficiency (%)	**17.6%**	**-7.1%**	n/a	**10.5%**
S&C				
Efficiency (£k)	£65	£ 35	n/a	£100
Efficiency (%)	**20.8%**	**11.1%**	n/a	**31.9%**
Non volume				
Efficiency (£k)	n/a	n/a	-£73	-£73
Efficiency (%)	n/a		**-59.5%**	**-59.5%**
Total efficiency				
Efficiency (£k)	£184	-£13	-£73	£98
Efficiency (%)				**8.8%**

Table 18: Track efficiency breakdown by volume, unit cost and non-volume.

Note to table: Numbers may not cast due to rounding

Volume savings vs. baseline (2013/14)

Network Rail bases its calculation of volume efficiency for Plain Line and S&C renewals on a comparison between the original ORR assessed volume (PR08 baseline) and the actual volumes delivered.

With regard to the 2013/14 in-year volume efficiency calculation, we set out in the table below baseline, planned and actual volumes.

Track renewals volumes – 2013/14	2013/14 baseline (ORR PR08)	2013/14 target volume (2013 SBP)	2013/14 actual delivered volumes	Efficiency saving (based on actual vs. baseline)	Actual vs. target volume)
Plain Line volume (ckm)	2,258	2,115	1,861	**17.6%**	**-12.0%**
S&C volume (units)	555	427	439	**20.8%**	**2.8%**

Table 19: Track renewal volumes (2013/14) for plain line and S&C.

As indicated above, reduced volumes vs. baseline for both Plain Line and S&C during 2013/14 have contributed volume efficiency savings of 17.6% and 20.8% respectively. However, compared to the target set in Network Rail's 2013 SBP

Plain Line volume is actually 12% below the target level. In contrast, delivered S&C volume is 2% higher than the SBP target

CP4 volume reductions

During CP4, Network Rail revised its targeted delivery volumes downwards to account for policy-based changes in approach, with revised volumes set out in its 2010 Delivery Plan. We compare in the table below, the original baseline and revised (2010) target volumes with the actual volumes for the whole of CP4 (i.e. the full five-year period).

Track renewals volumes – CP4	CP 4 baseline (5Y): ORR PR08	CP4 target volume (NR 2010 Delivery Plan)	Actual delivered volumes in CP4	Difference between actual and PR08 baseline	% actual volumes vs. PR08 baselines
Plain Line volume (ckm)	10,956	9,455	8,809	2,147	**-19.6%**
S&C volume (units)	2,249	1,781	1,799	450	**-20.0%**

Table 20: Track renewal baseline volume calculation

As indicated above, actual delivered volumes of Plain Line at the end of CP4 total 8,809 ckm – a 19.6% reduction vs. baseline. The actual volume is also 6.8% below the revised CP4 target of 9,455. This is the result of Network Rail continuing to under-deliver its planned Plain Line volumes during 2013/14.

We understand that a portion of planned Plain Line renewal works for 2013/14, where Network Rail did not deliver against individual projects, will need to be delivered during CP5, resulting in some re-prioritisation of work. Network Rail has assessed that there is now a greater sensitivity in CP5 to shortfalls that could adversely affect track condition. However, as indicated previously in table 17, Network Rail is not reporting any specific deferral amount for CP5.

In contrast to Plain Line volumes, S&C delivered volumes are close to the 2010 target. Delivered volumes of 1,799 mean that an actual volume reduction vs. baseline stands at20.0% (only slightly lower than the 20.8% target reduction).

Unit cost efficiency – 2013/14 calculation

Network Rail is reporting overall unit cost inefficiencies of approximately £13 million. S&C renewals are showing just over £35 million of savings from unit cost reductions; this is more than offset by inefficiencies of approximately -£48 million reported for plain line renewals, the larger cost category.

7.2.4 Track renewals efficiency: PMA evidence

Network Rail's '*Final Efficiency Report (REEM), Track Renewals, 2013/14'* details the workings and assumptions that support the 2013/14 track renewals efficiency calculation.

Volume efficiency savings

As has been discussed above, a change in asset policy during the control period, from a time to condition-based replacement, has enabled Network Rail to reduce the work that it needed to carry out, resulting in volume savings underpinning the efficiency calculations. Network Rail agreed with the ORR that reprioritisation of renewals onto the more critical routes of the network and replacing this with refurbishment on the lower criticality routes was a robust approach to cost reduction and efficiency. As such, volume based efficiencies are based on the assumption that Network Rail has continued to deliver the pre-determined volume savings over the course of CP4 which is demonstrated by the yearly efficiency figures. We review the planned and actual volumes in the context of robustness and sustainability in the following section.

Unit cost efficiency savings

As with last year, the majority of PMA evidence that we have received from Network Rail relates to unit cost savings for plain line and S&C. Network Rail has provided a detailed breakdown and supporting notes for these savings.

Network Rail has noted a series of factors which have influenced positively plain line and S&C unit costs. These include:

- improved S&C site costs through contract negotiations,
- reduced plain line indirect costs due to central changes,
- track reorganisation and headcount reduction,
- improved S&C maintenance costs due to reorganisation and
- improved S&C material costs with a reduction in component costs and manufacturing prices.

Unlike last year, Network Rail has noted that for Plain Line renewals, the majority of PMAs (as listed above) have become inefficient (except indirect costs); this includes site costs, material costs and maintenance costs. Network Rail has provided commentary as to why they have become ineffective, which is mainly due to an increasing cost base. This is due to Network Rail's use of fixed volume contracts for their renewals work. As a result, this has hindered the possibility of Network Rail achieving increased savings by delivering less volume. The fixed costs have been spread over a lower volume base that has led to higher unit costs and an overall unit cost inefficiency.

Other factors that have also adversely influenced unit rates include; the increase in costs related to rail and sleepers – this is a result of an increasing base cost of materials since 2011; and an increase in haulage costs due to NDS' transition to cost reflective pricing uplift.

7.2.5 Track renewals efficiency: robustness and sustainability

Key evidence presented

Network Rail has presented the robustness and sustainability evidence on a similar basis to previous years. This information includes:

- acceptance by the ORR of Network Rail's track renewals asset policy at the start of CP4, inclusive of revised volumes (as reflected in the 2010 Delivery Plain update referred to above);
- compliance of Network Rail's planning and delivery with asset policy, inclusive of activities related to route criticality;
- track asset condition and performance KPIs related to track geometry, track failures, geometry faults and rail breaks during CP4 (provided in support of maintenance efficiencies); and
- evidence of long term analysis and modelling of asset performance that informs Network Rail's current work and delivery. These measures include trends of stable and improving performance against these measures to the end of CP11.

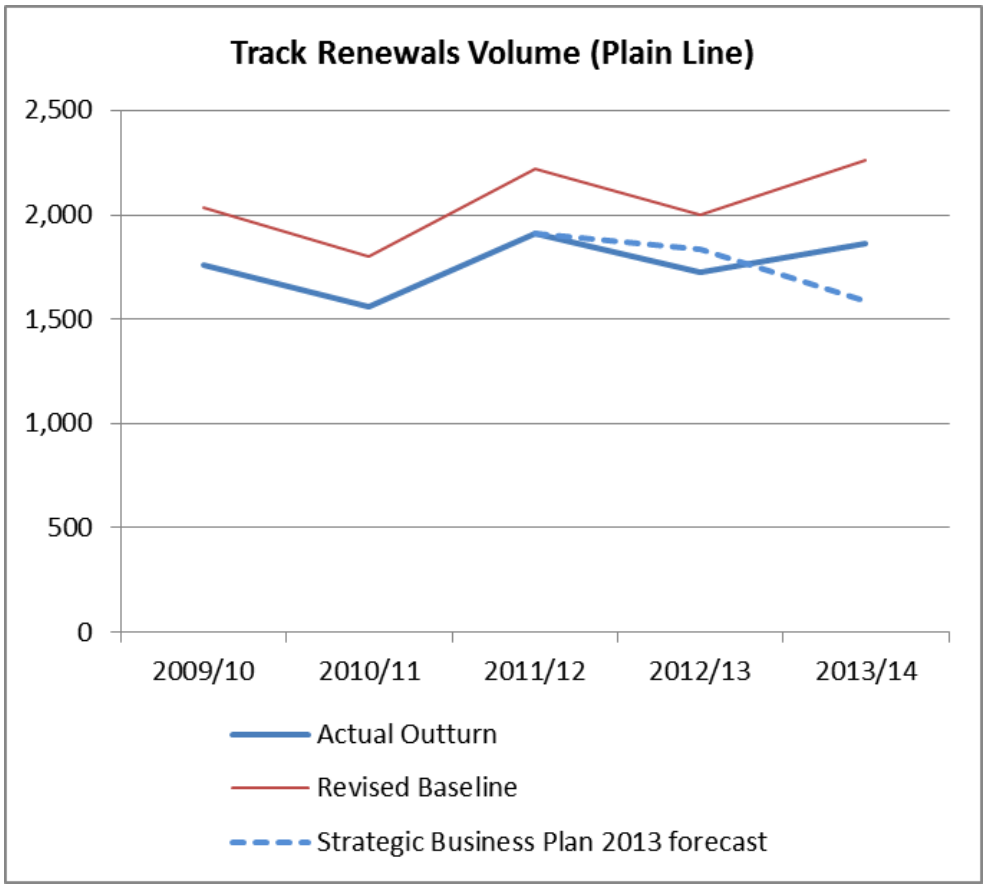
The inefficiency in non-volume related work is an ongoing issue. Network Rail has highlighted this is due to refurbishment works, fencing, drainage and the national gauging programme, noting that a sizable amount of this is due to contractor restructuring which should be have one-off cost impact. The significant increase in non-volume renewal costs from £142 million in 2012/13 to £189 million in 2013/14 has been attributed to increased refurbishment works (£21m) and other non-volume works (£17m), which were investment decisions made by Network Rail earlier in the year. The increased amount of refurbishment works is attributable to the rollover from prior years where the schedule of work was adjusted around access availability and deliverability against the increased work bank. We also understand that additional refurbishment was undertaken by Network Rail to manage asset condition and reduce faults, though no detailed evidence has been provided on this matter.

In 2012/13, the ORR noted its concern around Network Rail's Track Drainage Asset Policy. As with last year, track drainage works - a non-volume renewals activity - have seen an increase in expenditure forming 14% of total non-volume expenditure in 2013/14.

Geometry faults per 100km have not met Network Rail's targeted improvement metric, although the shortfall is fairly modest, with reported performance of 36.51 against the ORR CP4 success criteria of 35.90. Nevertheless, this represents a concern around the sustainability of the track assets. We note that the poor track geometry performance is occurring on secondary routes, which according to the revised track policy document are where more refurbishment rather than renewals work has been occurring. Without further information, we are unable to determine if there is a connection between these factors.

Overview of volume delivery shortfall

Below we compare the volume profiles set out in Network Rail's successive delivery plans for plain line and S&C renewals. We also compare in the charts that follow, baseline, planned (SBP 2010) and actual volumes for 2013/14.



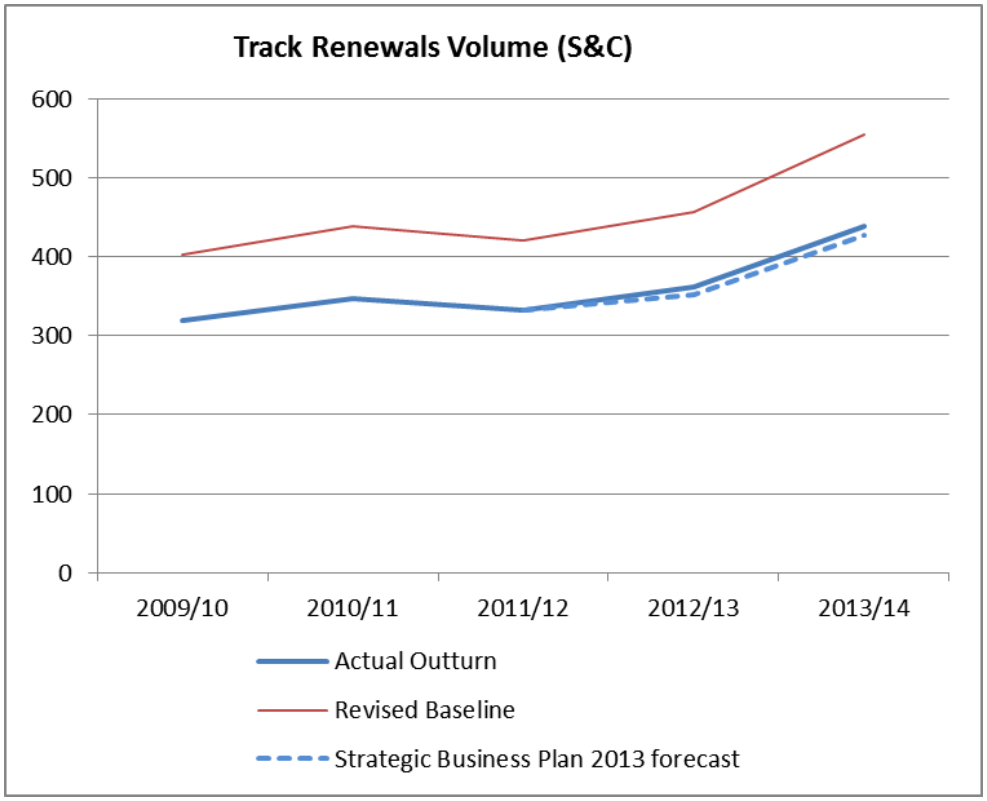


Figure 5 and 6: Track renewals for plain line and S&C.

Against the updated CP4 baseline figures, plain line experienced a shortfall of 402ckm and S&C 115equ in 2013/14. As previously mentioned, due to the revised track asset policy these volume shortfalls have been reported as efficiency in the REEM efficiency figures. This is because Network Rail has determined that the track asset base is robust and sustainable and this negates the need of delivering the total volumes established at the start of the control period.

Network Rail has attributed the reported plain line shortfalls to include; access issues; contractor resource based constraints; NDS resource-based issues; shortfalls due to overrunning works and scope revisions; and the significant challenge of delivering High Output works on the LNW and LNE routes.

The *'CP4 Asset Performance and Volume Delivery – Initial Summary'* suggests that these volumes will need to be delivered during CP5, through a reprioritisation of the workbank, which is a concern. We note that there is little contingency for shortfall in CP5 to ensure a robust and sustainable track asset base and believe that these volumes could create a significant challenge for Network Rail.

Implications of volume delivery shortfall

In previous years, Network Rail has provided us with a chart that demonstrated the distribution of planned and actual delivered plain line renewals by track quadrant – track quadrants are based on the criticality of routes. We have not received this quadrant-based breakdown for 2013/14 so are unable to comment on how the volume shortfalls may affect critical routes.

Network Rail has provided documentation that demonstrates the volume delivery in 2013/14 by route, against the latest strategic plan. The shortfall in plain line delivery includes; 69ckm LNE route, 46ckm on the LNW and 6.9ckm on the Western route. These are the most critical routes on the network and it is a concern that these shortfalls have taken place. They could have a negative impact on the overall sustainability and robustness of the lines. The Anglia and Wessex lines have also experience large shortfalls that could lead to sustainability and robustness issues. As discussed in the maintenance renewals section of the report, track-related faults were also a cause of increased delay on LNE, Kent, Anglia and Cross Country routes.

S&C delivery on the LNE and LNW routes has been positive against the latest plan, with an above target delivery of S&C units. (The Western route has performed marginally below target with a shortfall of 1.8ckm.)

7.2.6 Track renewals efficiency: reporter opinion

PMA evidence

We have reviewed the PMA evidence submitted by Network Rail for 2013/14 and we consider that it has a reasonable level of clarity and detail to support Network Rail's efficiency calculation. However, as was the case last year, we have a concern around the overall sustainability of the track assets.

Robustness

In relation to robustness for track assets, we consider that there is material uncertainty around track maintenance activities (as highlighted earlier in the

report). Most notably, there has been a 6.7 per cent increase in track-related incidents compared to the prior year, with track-related faults a cause of increased delay on LNE, Kent, Anglia and Cross Country routes. Performance on other track asset measures improved, although geometry faults per 100 km remained below target.

We consider that the shortfalls discussed in this chapter may have had an impact on the condition and performance of the asset base. However, based on the information provided we are unable conclude if a direct linkage exists between shortfalls in track volumes and the non-delivery of regulated performance outputs during CP4.

Sustainability

As Network Rail has stated in the *'CP4 Asset Performance and Delivery – Initial Summary',* the long-term sustainability of the track policy is unaffected by the shortfall in CP4, however the track is more vulnerable to under-delivery in the next control period, especially around ballast. Network Rail has stated that a similar under-delivery in CP5 may lead to a problem for track sustainability. In effect, by under-delivering on volume in CP4 any contingency Network Rail had for CP5 is now gone.

As already noted, we have not received quadrant data on where the volume shortfall sits so we are unable to comment on the criticality this represents. Network Rail has stated that the loss of high priority jobs in the last two years has resulted in performance risk at route level. From the data that we have received, we understand that the shortfall has occurred on the critical LNE, LNW and Western Routes. Considering the criticality of these routes, there is a sustainability concern as to how these volume shortfalls may affect the asset performance going into CP5, and the impacts this may have on services.

Network Rail has stated that these critical route shortfalls have occurred due to access problems and the availability of high output machinery. Having reviewed the evidence it is apparent that these issues have yet to be solved by Network Rail and are an on-going matter. This may further affect Network Rail's ability to deliver the required volumes for CP5 to maintain the sustainability of the track asset base.

We are concerned that Network Rail has not met the ORR target for track geometry faults per 100km, which suggests that the current assets are not performing in a sustainable manner. Network Rail has stated that the shortfall in ballast renewal and refurbishment is a key contributing factor to track geometry faults and that this will be a focus in CP5 to improve performance. However we believe that ballast is only one issue of many which can lead to track geometry faults and, therefore, ballast improvements may not improve the performance of track geometry to the extent envisaged by Network Rail.

7.3 Signalling renewals efficiency

Signalling is the second largest renewals expenditure category, representing over a fifth of actual renewals spend in 2013/14. Network Rail is reporting an efficiency of £77.8 million (12.6%) for the asset, as shown in the table below. This is lower than the level of efficiencies it has reported in previous years in the control period. Unlike other assets, Network Rail has had to adjust the baseline for signalling downwards by £61 million in 2013/14.

Signalling efficiency, (2013/14 prices)	2012/13	2013/14
REEM pre-efficient baseline (£m)	698.0	619.1
Actual expenditure (£m)	565.6	541.3
Efficiency (£m)	**132.4**	**77.8**
Efficiency (%)	**19.0%**	**12.6%**

Table 21 Signalling renewals expenditure and efficiency overview.

Network Rail has changed its efficiency numbers from those we initially received for our review, largely by increasing actual expenditure incurred in 2013/14. This has reduced the reported efficiency by £1.4 million from £79.2 million to £77.8 million. We have not received an explanation for why the numbers have changed.

7.3.1 Signalling expenditure vs. plan

Total Signalling Renewals Expenditure, £m (2013/14 prices)	2013/14	CP4 Total	Planned deferral of total CP4 spend into CP5
2009 CP4 Delivery Plan	519.1	2522.4	-
Strategic Business Plan 2013	547.1	2485.2	-
Actual Outturn	541.3	2450.0	13.6

Table 22 Total signalling renewals expenditure

Network Rail's delivery of signalling renewals work was very close to its most recent budget (the 2013 Strategic Business Plan), with a minimal shortfall of 1% of budgeted expenditure both for the financial year, and the control period overall. Network Rail delivered budgeted numbers of signalling units (SEUs) for the control period. Network Rail also delivered an additional volume of conventional signalling units associated with Crossrail project works that are not included within the original REEM calculation (due to the re-scoping of these additional units that Network Rail has delivered, from ERTMS to conventional signalling units).

Network Rail under-delivered on planned volumes of ERTMS signalling units – partly because of the re-scoping of the Crossrail project mentioned above, with conventional signalling units being delivered rather than ERTMS. Network Rail had to change how it would roll out the ERTMS programme early within the control period, resulting an agreed deferral of £52 million which was removed from the CP4 baseline in 2010/11, and is partly offset by the conventional renewals delivered for the Crossrail project.

Network Rail also under-delivered on level crossings, carrying out only 61% of the planned volume of renewal work in CP4. Some work is no longer required (for example if the level crossing has been closed, or will be delivered as part of larger schemes in CP5 to improve efficiency). Network Rail has also told us that it

does not believe this shortfall will impact on the sustainability of the asset. Only two of the 62 level crossing renewals which have deferred into CP5 due to planning problems require additional mitigation work, at an estimated cost of £100,000. Furthermore, some of the deferred volumes are for work which has been substantially completed but will be commissioned in 2041/15, the point at which Network Rail recognises that signalling assets have been delivered.

Further signalling renewals works valued at nearly £14 million have been deferred into CP5, which are linked to the National Operating Strategy to establish route-level control centres. Network Rail told us that the work was deferred in order to prioritise other activity which had not been included within CP4 and therefore it has been removed from the baseline.

7.3.2 Efficiency breakdown by volume and unit cost

We have analysed the signalling efficiency data Network Rail provided us with to identify volume, unit cost and non-volume efficiency savings in the table below.

Signalling renewals 2013/14	Volume efficiency	Unit cost efficiency	Non-volume efficiency	Total efficiency
Resignalling - SEUs GRIP 1-4				
Efficiency (£k)	£0.0	£24.1	N/a	£24.1
Efficiency (%)	**0.0%**	**3.9%**	**N/a**	**3.9%**
Resignalling - SEUs GRIP 5-8				
Efficiency (£k)	£31.8	£68.4	N/a	£100.2
Efficiency (%)	**5.2%**	**11.1%**	**N/a**	**16.2%**
Other (including non-volume, level crossings, modular signalling and ERTMS)				
Efficiency (£k)	£0.0	£8.8	-£55.4	-£46.6
Efficiency (%)	**0.0%**	**1.4%**	**-9.0%**	**-7.5%**
Total efficiency				
Efficiency (£k)	£31.8	£101.4	-£55.4	£77.8
Efficiency (%)	**5.2%**	**16.4%**	**-9.0%**	**12.6%**

Table 23: Signalling renewals efficiency breakdown by volume, unit cost and non-volume.

Network Rail reports the largest savings from projects to renew signalling units which are in the "GRIP 5-8" project stages, which represent advanced stages of design or in delivery[27]. GRIP 5-8 projects accounted for 35% of expenditure in 2013/14. Two-thirds of these savings are achieved from unit costs from projects while one-third are due to volume savings.

Half of expenditure in 2013/14 was on projects we have categorised as other renewals work. This includes all level crossing replacement, European rail traffic management system (ERTMS), and modular and other signalling projects for which there were no budgeted volumes. We have also included accounting

[27] Network Rail has eight stages in its Governance of Investment Projects (GRIP) process. Stages 1 to 4 involve output definition to the development of a single option. Stages 5 to 8 progress a project from detailed design to close out.

adjustments of £62.1 million[28] in this category because we did not have information about the projects to which they relate.

7.3.3 Signalling renewals efficiency PMA evidence

Network Rail has provided calculations on a project by project basis for both unit cost and volume efficiency savings for the largest contributor to signalling efficiencies, SEU re-signalling projects in GRIP stages 5-8. There are seventeen such projects where it has reported savings.

The volume saving from these projects, totalling £31.8 million, has arisen from design or scope changes which enabled fewer units to be replaced than had been originally planned.

Unit cost savings for GRIP 5-8 projects total £68.4 million. These savings, broken down on a project-by-project basis, are attributed to the following six categories[29]:

- Use of solid state interlocking and other technology, £20.0 million,
- Remodelling and rationalisation, £38.6 million,
- Alignment with other assets, £10.8 million,
- Contractor milestone, £0.013 million,
- Policy, £3.7 million and
- Other, inefficiency of £8.5 million, being adjustments for savings claimed in previous years.

Network Rail recognises its efficiencies on an earned value basis. This means it claims a proportion of the forecast savings it expects to achieve on a project, according to the amount it has spent to date. This differs from when it recognises the delivery of units within a project which occurs when the work is commissioned. Therefore, some of the efficiency savings claimed are on projects which will be commissioned in CP5.

In previous years we have not received an explanation for the efficiencies claimed on projects in the planning stage, GRIP 1-4, and have recommended that having one would provide us with greater confidence around the reported efficiencies. From the information supplied to us this year it appears that the £24.1 million unit cost saving from projects in GRIP 1-4 stages has been calculated by applying the PR08 efficiency target for signalling unit rates to the project baseline. When the project is in the delivery phase (GRIP 5-8) Network Rail stated that it will recognise any deviation, either adverse or favourable, from this standard rate. We consider this could give rise to the potential risk that Network Rail would have to

[28] Non-volume efficiency numbers include net adjustments of £62.1 million comprising £47 million retrospective baseline reductions, £13.6 million baseline reductions for deferred work and £1.4 million adjustments to expenditure numbers following our review.

[29] Network Rail also identified security measures as a PMA but has no recorded efficiency savings in FY 2013/14 for this action.

reverse some of the efficiencies it has claimed in CP4, on projects at both GRIP 1-4 and GRIP 5-8 stages, as it delivers and commissions these projects during CP5. However, Network Rail has provided evidence indicating that during CP4, outturn cost rates of GRIP 5-8 signalling projects have exceeded the targeted levels of efficiency savings rather than fallen short; this suggests there is not a high probability that outturn unit costs are likely to end up significant higher than expected in future, although the risk remains.

Before adjustments, the following efficiencies have been identified within assets renewals we have included in the other category:

- Level crossing replacement, £6.5 million,
- Modular signalling, £2.3 million,
- ERTMS, £3.5 million and
- Non-volume work delivered, £3.3 million.

We have been provided with examples of projects contributing to efficiencies in these areas but not detailed supporting evidence for them.

7.3.4 Signalling renewals efficiency robustness and sustainability

Network Rail has performed better than the CP4 regulatory target of 2.39 for the condition of its signalling asset for the whole of the financial year. It achieved a score of 2.33 at the end of 2013/14, the best score of the control period, as a result of ensuring sites were commissioned and condition data uploaded by the year end. This is the principal evidence confirming that the efficiencies Network Rail has made on signalling are sustainable. The condition of level crossings, which is an internal Network Rail measure, has marginally worsened between 2012/13 and 2013/14 which may have been the effect of delays to level crossing renewals work.

Further evidence is provided by a recent Arup review of Network Rail's compliance with its asset policies during CP4.[30] Network Rail's asset policies are designed to ensure that assets will not deteriorate given stable levels of use. For signalling, Arup concluded that it was not possible to establish how policies had been considered when the sampled schemes were planned, due to poor authorisation documentation. However, we can take some assurance from a retrospective review of some schemes which confirmed that policies had been met.

In relation to asset reliability, Network Rail has failed to meet all three of its signalling failure measures in 2013/14, with failure rates higher than target for track circuit, points and signalling failures causing delays of more than ten minutes. However, we consider this to be more an issue around levels of maintenance – as discussed in earlier sections of this report – and we have not identified any specific robustness issues in relation to the levels of signalling renewals activity or associated efficiency calculations.

[30] Mandate AO/026 Application of CP4 Asset Policies, 25 April 2013 which reviewed work from the 2012/13 signalling renewals workbank.

7.3.5 Signalling renewals efficiency reporter opinion

We have been provided with a reasonable level of information about the PMAs which have contributed to signalling efficiencies but are concerned that some efficiencies may be reversed in the next control period. The largest area of efficiencies (signalling projects in GRIP 5-8 stages of delivery) are explained on a project by project basis. Network Rail recognises efficiencies on an earned value basis, based on the proportion of expenditure incurred in year relative to forecasts.

It is therefore recognising efficiencies on projects which will be delivered and commissioned during CP5. Furthermore, Network Rail has explained how unit cost efficiencies for GRIP 1-4 expenditure, of £24.1 million, have been calculated this year[31]. It has applied its target unit cost efficiency for PR08 to the planned volume of renewals work. Network Rail will therefore have to recognise variations to the level of efficiency it has reported, either positive or negative, during CP5 when the projects are being delivered.

The condition of its signalling assets has been better than target for the whole of 2013/14, despite considerable shortfalls in the delivery of planned ERTMS and level crossing renewals over the control period. While Network Rail has recorded a slightly worse condition for its level crossings internal measure in 2013/14, only two per cent of undelivered level crossing renewals have required mitigation work due to condition risks. However, Network Rail has recorded higher than target failure rates for track circuit, points and signalling failures causing delays of more than ten minutes. At the time of writing, we have not received much of the additional information and we are unable to conclude whether issues with signalling failures are due to a lack of maintenance or renewals activity.

7.4 Buildings renewals efficiency

Network Rail spent £260.8 million in 2013/14 on buildings[32] renewals work, some 10.5% of all its expenditure on renewals in the year. This is the largest asset class, by actual expenditure, for which Network Rail does not provide a breakdown by volume, unit cost or other sub-category.

Buildings expenditure (2013/14 prices)	2012/13	2013/14
REEM pre-efficient baseline (£m)	312.1	314.4
Actual expenditure (£m)	209.0	260.8
Efficiency (£m)	**103.0**	**53.6**
Efficiency (%)	**33.0%**	**17.0%**

Table 24: Buildings renewals expenditure and efficiency overview

The efficiency Network Rail has calculated for buildings, at 17.0%, is considerably lower than in 2012/13. Scotland is responsible for 75% of the efficiencies reported in year, even though it only represents 13% of actual expenditure on buildings. This is because Network Rail had in previous years

[31] In previous years we recommended that we receive sight of how GRIP 1-4 expenditure correlates to efficiencies recognised on projects in the planning stage.
[32] This asset category is also referred to as operational property

over-stated the amount of work it deferred from year to year. For 2013/14 deferrals, into the next control period have had to be agreed with ORR, and this process has provided extra clarity on the extent of deferrals. Arguably, Network Rail should have restated its efficiencies in previous years rather than, as it has done, claim additional efficiency in 2013/14.

7.4.1 Buildings expenditure vs. plan

Actual expenditure in 2013/14 was 18% higher than Network Rail's most recent business plan and, therefore, it did not achieve the efficiencies of around 30% it had forecast[33].

Total buildings renewals expenditure, £m (2013/14 prices)	2013/14	CP4 Total	Planned deferral of total CP4 spend into CP5
CP4 Delivery Plan (2009)	197.9	1404.9	-
Strategic Business Plan 2013 forecast	221.7	1318.0	-
Actual Outturn	260.8	1306.0	14.0

Table 25: Total buildings renewals expenditure

Network Rail has deferred £14 million of renewals work for the roof of Paddington Station because access to carry out the work has been limited due to work on the Crossrail project also taking place around the station. Network Rail has treated this as a neutral deferral, by removing the cost from the baseline. This is a treatment that is allowed within CP5 regulatory accounting guidelines, but is not compliant with CP4 guidance.

7.4.2 Buildings renewals efficiency PMA evidence

As in previous years, Network Rail has assigned the efficiencies it has achieved to four PMAs, using a model to apportion efficiencies according to the impact the action was expected to have had when it was introduced:

- **Workbank planning** leading to savings by reducing design change, more inhouse design, and more competitive tendering through better work packaging and earlier award of contracts (£40.4 million, 75% of efficiencies),
- **Design to cost** using value management, value engineering and standardised design to reduce design and implementation costs (£8.2 million, 15% of efficiencies),
- **Cost modelling and investment** to improve cost estimating in the early stages of projects resulting in lower contingency which can end up being spent through project scope creep (£2.1 million 4% of efficiencies),

[33] The difference between the pre-efficiency baseline, adjusted to include deferred work, and the 2013 strategic business plan forecast.

- **Efficient project governance** to reduce operating costs within Network Rail and overheads in its supply chain (£2.8 million, 5% of efficiencies)

Network Rail told us that it has not attempted to verify whether the PMAs it introduced have had the anticipated affect nor has it made any other attempt to validate the assumptions in its model. This means there is uncertainty about how its efficiencies in buildings have been achieved.

7.4.3 Robustness and sustainability

In Arup's review[34] of Network Rail's compliance with operational property asset policies, we concluded that Network Rail had largely complied because its policies reflect current working practices. This provides us with assurance that efficiencies are not being made at the expense of the long-term asset condition.

We have obtained further assurance from Network Rail's Station Stewardship and Light Maintenance Deport Stewardship measures. Both measures are lower, and therefore the assets are in better condition, than the targets as set out in ORR letter 'Success in CP4'.[35]

[34] Mandate AO/026 Application of CP4 Asset Policies, 25 April 2013 which reviewed work from the 2012/13 operational property workbank.
[35] ORR letter to Network Rail, "Success in Control Period 4", 1 March 2011

7.4.4 Buildings renewals efficiency reporter opinion

Last year we concluded that there was material uncertainty with the value of buildings renewals efficiencies which Network Rail reported. This was because it was not clear how Network Rail's reported efficiencies had been achieved; we could not link the savings to projects or individual assets. This uncertainty remains because Network Rail attributes its efficiencies to PMAs using a model which it has not validated by examining whether its actions have had the anticipated impact in terms of efficiency savings.

However, because this is the last year of the control period we have been able to identify the extent to which work has been deferred, removing a key area of uncertainty within the efficiency savings calculation. All work carried over into the next control period has had to be agreed with ORR, and so it is clear that for buildings renewals it is a minimal amount of £14 million for works at Paddington station. This deferral has been treated as a neutral deferral, by removing the cost from the baseline against which efficiencies are calculated, a process which is allowed for in the next control period but does not exist in CP4.

Overall, we are satisfied that Network Rail's reported station and depot stewardship measures demonstrate that efficiencies are not resulting in deterioration of the asset.

7.5 Telecoms renewals efficiency

Network Rail spent £105.7 million in 2013/14 on telecoms renewals work (excluding FTN assets[36]); some 4.2% of all its expenditure on renewals in the year. Although FTN assets form part of the asset base managed by Network Rail's Telecoms Asset Management Team, Network Rail has listed them as separate renewals category because the FTN is a separate system in relation to the overall telecoms network.

[36] We note that in the context of this report, FTN renewals relate to all FTN and GSM-R infrastructure.

Telecoms efficiency (2013/14 prices)	2012/13	2013/14
REEM pre-efficient baseline (£m)	58.0	146.5
Actual expenditure (£m)	46.0	105.7
Efficiency (£m)	12.0	40.8
Efficiency (%)	20.7%	27.8%

Table 26: Telecoms renewals expenditure and efficiency overview

The efficiency Network Rail has calculated for telecoms, at 27.8%, is higher than in 2012/13 by 7.1% and is above the REEM efficiency trajectory for renewals of 25.2%.

This efficiency of £40.8 million sits entirely within England and Wales, with Scotland reporting an inefficiency of £3 million, which was due to unforeseen extra works. The sharp increase in baseline and efficiency figures between 2012/13 and 2013/14 is due to a larger amount of works delivered in order to prevent a deferral to CP5.

7.5.1 Telecoms expenditure vs. plan

Telecoms renewals expenditure results for the 2013/14 financial year and total CP4 expenditure are presented in the table below.

Total Telecoms Renewals Expenditure, £m (2013/14 prices)	2013/14	CP4 Total	Planned deferral of total CP4 spend into CP5
2010 CP4 Delivery Plan	58.2	295.7	-
Strategic Business Plan 2013	102.7	286.4	-
Actual Outturn	105.7	282.0	-

Table 27: Total telecoms renewals expenditure

Actual expenditure in 2013/14 was 3% higher than Network Rail's most recent business plan; however, overall the total CP4 outturn is £4.4 million less than forecast in the Strategic Business Plan 2013 representing a final saving of 1.5% in CP4.

7.5.2 Telecoms renewals efficiency PMA evidence

As in previous years, Network Rail has assigned the efficiencies it has achieved to a project-by-project list of PMAs that account for approximately £35 million of

the total £40.8 million efficiency in 2013/14. Network Rail has told us that they do not record PMAs for telecoms which have a value of less than £200,000 applying to approximately £5.8 million of efficiencies.

7.5.3 Telecoms renewals efficiency robustness and sustainability

To demonstrate the robustness and sustainability of telecoms, Network Rail has provided results under the metric 'Telecoms Asset Condition'. This metric, which Network Rail's Decision Support Tool generates, takes into account the overall asset condition and performance. The score achieved in 2013/14 is 0.977, an improvement on last year's score of 0.966. While this uplift is positive, we note that it is still scoring less than 1.0, which suggests that the asset is still underperforming. This could have an impact on the asset life and overall telecoms asset sustainability if there are no further improvements in CP5.

'Telecoms failures causing train delays of more than 10 mins' has performed poorly in 2013/14. Network Rail has informed Arup that this underperformance is related to FTN GSM-R related incidents which should be accounted for independently from telecoms delay minutes. We discuss this further in the section 7.6 below.

7.5.4 Telecoms renewals efficiency reporter opinion

We consider the PMA evidence base is reasonable, with the majority of efficiencies substantiated with detailed evidence from individual projects.

In relation to the robustness of telecoms related assets, we would consider the assets to be generally performing well, except for poor performance associated with FTN and GSM-R system (responsible for the majority of delay minutes), which we discuss further in the next section.

Regarding sustainability, we have noted that there has been an improvement in the asset condition, continuing the pattern of improvement seen in 2012/13; this suggests that Network Rail's renewals are contributing to an increasingly sustainable asset base. However, the ASI metric of less than 1.0 is still a concern as it indicates that the asset may be experiencing a shortfall in its remaining life. This could have an impact on the asset life it further improvement does not occur within CP5.

7.6 FTN renewals efficiency

7.6.1 FTN efficiency calculation

FTN expenditure in 2013/14 totalled £92.2m, which represented 3.7% of renewals expenditure for the year.

FTN efficiency, (2013/14 prices)	2012/13	2013/14
REEM pre-efficient baseline (£m)	123.2	76.9
Actual expenditure (£m)	145.8	92.2
Efficiency (£m)	-22.6	-15.4
Efficiency (%)	-18.3%[37]	-20.0%

Table 28: FTN renewals expenditure and efficiency overview

Network Rail has calculated an inefficiency of 20.0% for FTN in 2013/14, an increase of 1.7% on 2012/13 and considerably below the REEM trajectory efficiency for renewals of 25.2%.

7.6.2 FTN expenditure vs. plan

FTN renewals expenditure results for the 2013/14 financial year and CP4 totals are presented in table 29 below.

Total FTN Renewals Expenditure, £m (2013/14 prices)	2013/14	CP4 Total	Planned deferral of total CP4 spend into CP5
2010 CP4 Delivery Plan	27.9	825.3	-
Strategic Business Plan 2013	139.6	896.1	-
Actual Outturn	92.2	852.0	-

Table 29: Total FTN renewals expenditure

As indicated in table 29 above, Network Rail's outturn has significantly increased since the 2010 CP4 Delivery Plan, mainly due to an increased scope. However, actual expenditure in 2013/14 was 44% lower than Network Rail's most recent business plan, (Strategic Business Plan 2013), with the overall CP4 outturn £44.1 million lower than forecast.

7.6.3 FTN renewals efficiency PMA evidence

Network Rail has not provided us with quantitative evidence to explain these inefficiencies in 2013/14. However, they have indicated that the reasons for the FTN inefficiency in 2013/14 are the same as the previous year, identified as:

- additional asset testing which involves radio signal verification, additional commissioning and network testing;

[37] This figure was listed as -18.8% in Arup's 2012/13 report, we assume this was an accounting error in the previous document.

- an increase in activities related to cell planning such as an increase in mast sites and tunnel solutions, as well as additional fill sites for signal testing;
- trespass and vandalism measures; and
- snagging works for sites in readiness for asset handover to maintenance.

According to Network Rail, the cost escalation has been offset in part by efficiencies found in rolling stock cab fit-out works.

7.6.4 FTN renewals efficiency robustness and sustainability

FTN assets, although reported as a standalone renewals expenditure category under the REEM, are also captured within the Network Rail Telecoms Asset Management Policy. We have noted that the asset policy makes limited reference to FTN asset management, which is a concern for us considering the scale of the system. As with last year, Network Rail has reported that the FTN programme is more of an enhancement and as a result does not have an asset policy.

During our review in 2011/12 of the regulatory accounts, Network Rail provided us with documentation of the FTN authority papers, which demonstrated compliance with programme controls. Last year we assumed that these remained valid for our 2012/13 review and Network Rail has indicated that this is the case for this year also.

Network Rail has attributed the negative 'telecoms stewardship indicator' during 2013/14 with failures in the GSM-R system. This has led to an increase in 'telecoms failures causing train delays of more than 10 mins' related to GSM-R. Non-GSM-R related delays were approximately 54,000, below the agreed ORR target, however, with the addition of the GSM-R related delay minutes the total delay minutes far exceed the overall target.

Network Rail has provided us with data that notes the cause of FTN GSM-R delay minutes against fourteen root cause codes. This analysis notes that 19.6% of causes are for registration failures and 31.4% for cab radio faults, which are critical functions of this FTN system. Furthermore, 17.8% of these faults are listed by Network Rail as unknown, suggesting that the root cause of nearly one-fifth of GSM-R delay minutes is not accounted for.

It is our understanding that Network Rail intends to address these system issues in CP5, and will continue to monitor and report on the FTN asset performance.

7.6.5 FTN renewals efficiency reporter opinion

As noted last year, Network Rail has indicated that FTN assets are captured within the telecoms asset management policy, we note that the policy makes limited reference to FTN assets specifically. While Network Rail considers the FTN to be an enhancement, we are concerned by the lack of dedicated asset policy in place when considering the scale and complexity of the system.

Network Rail has identified -£15.4 million of inefficiency in FTN renewals in 2013/14. We understand that FTN renewals were inefficient and therefore did not have any corresponding PMAs, however, Network Rail's explanation of the factors driving this inefficiency is not complete. Network Rail did not provided us

with any documentary evidence to support this negative efficiency figure, instead informing us that the reasons had not changed since last year's report.

We believe that there is a concern around the robustness of the overall FTN GSM-R system. Issues have arisen with the reliability of the GSM-R system during 2013/14, with the Telecoms performance measure 'Telecoms failures causing train delays of more than 10 minutes' nearly double the regulator's success level for the year. Of a total of 90,310 delay minutes associated with telecoms failures, nearly 54,000 (60%), were due to the GSM-R system. From a technical perspective, GSM-R is an established technology which should not be experiencing these problems. As Network Rail's data demonstrates, over 50% of delay minutes are attributed to primary system functions, which suggests that the system is not performing as it has been specified and built to.

Network Rail has however informed us that reliability issues have been as much the result of behavioural and cultural issues amongst train drivers using the system in particular, and that improved training and practices should go a long way to resolving many of the reported faults (which are often user-attributable). Network Rail has also informed us that problems with earlier software releases supporting the system's operation have been addressed through the most recent software upgrade. Although delay minutes during early 2014/15 have remained above target, Network Rail has indicated it expects system performance to improve within CP5.

With regard to longer-term sustainability, Network Rail has noted that the resolution of GSM-R issues will restore the ASI to a positive figure; however, we are yet to receive evidence to show how this may be achieved.

7.7 Electrification renewals efficiency

7.7.1 Electrification efficiency calculation

Network Rail has calculated an efficiency of 34.4% for electrification renewals in 2013/14, a considerable increase on last year, as shown in the table below.

Electrification efficiency, (2013/14 prices)	2012/13	2013/14
REEM pre-efficient baseline (£m)	110.8	270.4
Actual expenditure (£m)	103.3	177.3
Efficiency (£m)	7.5	93.2
Efficiency (%)	6.8%	34.4%

Table 30: Electrification expenditure and efficiency overview

Network Rail re-scheduled a total of £245 million of work from previous years in the control period to 2013/14. After adjustments for work carried into CP5, this has resulted in a near doubling of the baseline for the year to £270 million. In previous years efficiencies have been most likely been understated. A more accurate treatment would be to restate previous years' results where works were rescheduled to increase the efficiency claimed in those years.

7.7.2 Electrification expenditure vs. plan

The 2013/14 baseline and actual expenditure levels exclude £111 million of work in three areas of renewals works, which Network Rail and ORR have agreed to defer to CP5.

Total Electrification Renewals Expenditure, £m (2013/14 prices)	2013/14	CP4 Total	Planned deferral of total CP4 spend into CP5
CP4 Delivery Plan (2009)	115.2	714.7	-
Strategic Business Plan 2013	240.2	650.8	-
Actual Outturn	177.0	565.0	111

Table 31: Total electrification renewals expenditure

The amount of work which has been deferred, representing 20% of outturn for the whole control period, is significant. Deferred work relates to SCADA (£36.6 million),[38] Great Eastern OLE renewal (£24.4 million) and various renewals works in Sussex, Wessex and Kent (£50.1 million)[39]. Network Rail told us that much of the deferred Great Eastern OLE work and projects in Sussex, Wessex and Kent will be completed in 2014/15.

7.7.3 Electrification renewals efficiency PMA evidence

Network Rail has provided information on PMAs estimated to have delivered £33.3 million efficiencies (36% of the total electrification efficiencies identified). These PMAs, which are summarised in the table below, largely relate the ways in which Network Rail has contracted or delivered packages of work, and how it has procured materials. The value of efficiency achieved has been estimated by examining the savings achieved on specific projects and applying it to 2013/14 expenditure on the portfolio of work which used the same approach. While this is a reasonable approach, we have only been given a few examples to support the calculations.

For two of the portfolio-wide initiatives – materials frameworks and workbank planning - Network Rail has used projects where it has deferred work into CP5 to calculate the extent of the efficiency. These projects have not yet been completed and there is, therefore, still some degree of uncertainty about the level of efficiencies that will be achieved.

[38] SCADA – substation control and data acquisition – is a national project to establish central control centres which will remotely monitor electrification assets.
[39] Last year we reported that Network Rail planned to defer work of £103 million from two projects – SCADA and DC LV Switchgear renewals work in Sussex Wessex and Kent – into CP5.

2013/14 Positive Management Actions	Estimated non-volume efficiency (£m)
Portfolio-wide interventions	
Main contractor selection – increased number and range of suppliers and better matching of suppliers to type of work and capacity. Saving calculated based on London South HV Upgrade project and applied to half of 2013/14 expenditure.	8.9
Materials frameworks – centrally procured and managed frameworks for high value items leading to an estimated 15% reduction in material unit costs. Saving calculated based on Southern Switchgear Renewals works in Sussex, Wessex and Kent and applied to 50% of portfolio.	3.3
Materials procurement – direct purchase of particular materials resulting in savings of an estimated 10% and these materials are included in 50% of schemes.	1.3
Forms on contract/ECI – contractor involvement in early design to minimise waste and rework during the detailed design phase estimated at 10% reduction in unit price on half of 2013/14 spend.	8.9
Delivery route selection – use of in-house route resources rather than IP and external suppliers resulting in a saving of 20% on project expenditure totalling £24 million.	4.8
Workbank planning – suppliers engaged on portfolios of work to enable better resource use resulting in lower cost. Saving calculated based on Great Eastern OLE renewal project and applied to half of 2013/14 expenditure.	4.5
Access optimisation – aligning work with other projects requiring access to same part of the railway to reduce cost and disruption	No value given
Sub-total portfolio-specific interventions	**31.7**
Project-specific interventions	
DC Cable Renewals – change to contract packaging	0.3
Project 128802/132259 – change in delivery from IP to route works with different contracting model	1.3
Sub-total project-specific interventions	**1.6**
Total efficiencies attributed to PMAs	**33.3**
Value of efficiencies not attributed to specific interventions	**59.9**
2013/14 Efficiency	**93.2**

Table 32: Electrification PMAs resulting in efficiency savings, not related to volume, in 2013/14.

In addition to the activity efficiencies identified above, Network Rail may have achieved volume efficiency savings but it cannot quantify the value of these

savings because volumes were not agreed at the start of CP4. However, in 2013/14, it only delivered 48% of electrification asset volumes for which it had budgeted. The difference may be due to work that is no longer required and can be claimed as efficiency, for example due to a change in policy, because the asset is in better condition than expected, or because it has been replaced through enhancement projects. There is also a difference in timing between expenditure which is accrued when incurred, and the asset being recorded as delivered, with assets recognised only when they are commissioned. Overall, the significant differences in activity and volume levels between successive plans, as well as in comparison to actual outturn, make review and audit of the renewals efficiency during CP4 difficult.

7.7.4 Electrification renewals efficiency robustness and sustainability

Network Rail reports the number of traction power service failures greater than 300 minutes to monitor how robustly its electrification assets are performing. In 2013/14 there were 85 incidents, which is above the target of 77 incidents for the year. It is also over 30 per cent higher than the number of incidents that occurred in 2012/13. Key causes of the increase in service failures include equipment design (relating to assets being phased out through renewals or enhancement work), and a maintenance issue with vegetation in Scotland.

These incidents do not appear to be directly related to deferrals in Network Rail's renewal programme; Network Rail has provided information showing that the excess delay incidents mainly occurred on the LNE and LNW routes – neither of which has had renewals works subject to deferral. As stated previously, we consider the uncertainty relating to robustness of electrification assets to be more an issue around maintenance activity levels.

Network Rail also monitors the condition of four assets to measure whether they are sustainable in the long term. Reported condition of three of the four assets during 2013/14 has been better than levels set out by ORR[40]:

- AC feeder station: better than target, 2.37 against a target of 2.78,
- DC substation: better than target, 2.34 against a target of 2.53,
- AC contact system: better than target, 1.25 against a target 1.60, and
- DC contact system: condition of 2.02, which is worse than target of 1.90.

In a separate review of Network Rail's compliance with asset policies during CP4, based on a sample of the 2012/13 electrification workbank, Arup concluded that work largely complied with its asset policy although documentation was poor.[41] We consider this to be reasonable evidence that Network Rail's renewals work is maintaining the condition of electrification assets in a sustainable way. The work was assessed against Network Rail's age-based replacement policy, which had

[40] Targets are given in ORR's letter to Network Rail, "Success in Control Period 4", 1 March 2011

[41] Mandate AO/026 Application of CP4 Asset Policies, 25 April 2013 which reviewed work from the 2012/13 electrification workbank.

been approved by the ORR. Network Rail has subsequently developed a condition-based approach.

7.7.5 Electrification renewals efficiency reporter opinion

We consider the PMA evidence provided by Network Rail to support electrification efficiencies to be insufficient. Network Rail identified PMAs totalling £33.3 million – just over a third of the total efficiencies reported. There is a lack of information about how the remaining two thirds, nearly £60 million, of the efficiency that Network Rail has reported on electrification has been achieved.

We also consider there is a lack of information to support the way in which the reported efficiency total is derived. The business has been unable to provide information on the extent of efficiency savings from reduced volumes as asset volumes were not agreed at the start of the control period. Network Rail delivered only 48% of its budgeted volume in 2013/14. Furthermore, the baseline against which efficiencies are measured has been affected by a net adjustment of £134 million of work rescheduled from prior years in the control period, meaning that in 2013/14 the efficiency is likely to be overstated while it was understated in previous years.

With regard to robustness, With regard to robustness, for its performance measure for electrification assets (traction power service failures greater than 300 minutes) Network Rail reports incidents in excess of target level during 2013/14. One of the root causes identified for the increased failure rate has been an increase in equipment design faults. However, these incidents do not appear to be directly related to deferrals in Network Rail's renewal programme; Network Rail has provided information showing that the excess delay incidents mainly occurred on the LNE and LNW routes – neither of which has had renewals works subject to deferral. We consider uncertainty relating to robustness of electrification assets to be more an issue around maintenance activity levels – as discussed previously.

Network Rail's measurements of long-term sustainability suggest that the condition of its electrification assets is being maintained, with three of four measures being better than the target ORR set for the end of CP4.

7.8 Plant & machinery (P&M) renewals efficiency

7.8.1 P&M renewals efficiency calculations

Network Rail is reporting an efficiency of £65.1 million (40.6%) for P&M, which is over double the efficiency achieved, in monetary terms, in 2012/13.

Plant and machinery efficiency, (2013/14 prices)	2012/13	2013/14
REEM pre-efficient baseline (£m)	108.8	160.2
Actual expenditure (£m)	84.2	95.1
Efficiency (£m)	24.6	65.1
Efficiency (%)	22.6%	40.6%

Table 33: Plant and machinery expenditure and efficiency overview

The P&M asset category consists of a number of different sub-assets. Network Rail provided us with calculations showing the efficiency savings for Depot P&M and signalling, power and communications (SP&C). Last year we also received information for National Delivery Service (NDS) but this information was not available for 2013/14. We have attributed the remaining efficiencies to 'Other P&M' as shown in the table overleaf.

Plant & machinery renewals 2013/14	Baseline (£m)	Actual (£m)	Efficiency amount (£m)	Efficiency %
SP&C P&M	70.0	49.0	21.0	30.0%
Depot P&M	33.8	3.8	30.0	88.7%
Other P&M	56.4	42.3	14.1	25.1%
Plant & Machinery total	**160.2**	**95.1**	**65.1**	**40.6%**

Table 34: Plant and machinery renewals efficiency by expenditure area

The Depot P&M sub-asset has the greatest reported efficiency at £30.0 million (88.7%) which is largely due to an understatement of efficiency in prior years. In 2013/14 Network Rail increased the baseline by £25 million to account for deferral of spend made in prior years of the control period. This work has subsequently not been required.

7.8.2 Plant & machinery expenditure vs. plan

Actual expenditure in 2013/14 on P&M was 69% of that forecast in Network Rail's most recent business plan, but considerably higher than had been originally forecast at the start of the control period, as shown in the table below. The information we have received on P&M is not complete and therefore we have been unable to confirm whether Network Rail has deferred work into CP5.

Total Plant and Machinery Renewals Expenditure, £m (2013/14 prices)	2013/14	CP4 Total	Planned deferral of total CP4 spend into CP5
CP4 Delivery Plan (2009)	62.9	457.4	-
Strategic Business Plan 2013	137.6	552.3	-
Actual Outturn	95.1	not given	not given

Table 35: Total plant and machinery renewals expenditure

7.8.3 P&M renewals efficiency: PMA evidence

Network Rail has provided extremely limited information on how P&M efficiencies have been achieved. For SP&C it has provided two examples of changes to the way work was contracted and delivered but the savings shared with us have not been quantified for either project.

7.8.4 P&M renewals efficiency: Robustness and sustainability

As in previous years, Network Rail has not provided evidence demonstrating the robustness and sustainability of its P&M efficiency savings.

7.8.5 Plant & Machinery renewals expenditure: reporter opinion

We consider there to be insufficient evidence of PMAs to support the efficiencies Network Rail is reporting in this area. Information on how efficiencies have been achieved has been extremely limited, with only two examples given of changes made to how SP&C work was contracted and delivered, which were not quantified.

As was the case last year, we cannot provide an opinion on robustness and sustainability of the efficiencies because we have not received any information in this area.

8 MUC (Maintenance Unit Cost) Confidence Grading Analysis

8.1 Introduction and background

We set out in this chapter our Confidence Grading Analysis of Maintenance Unit Costs (MUCs) included in the 2013/14 Regulatory Accounts.

Network Rail's MUC codes have changed during previous reporting years, increasing from an original 47 MNT Codes to 104 in the current year. The company reported 30 of these codes in the 2013/14 Regulatory Accounts, the same as those it reported in the previous year.

Arup has completed four previous data quality and confidence gradings of MUC unit costs, the results of which were as follows:

- September 2010 - confidence grading of C4.
- September 2011 - confidence grading of C2.
- September 2012 - confidence grading of B2.
- September 2013 – confidence grading of DX2.

The improvements in the assessed confidence gradings are indicative of the effort channelled into improving MUCs in recent years, resulting in a system that is a significant improvement over the initial MUC framework. The 2013 grading was an exception to this because it was severely affected by Network Rail's inability to supply data for the audit process. For 2013/14 we have adapted our assessment to account for changes in available data.

8.2 Approach

Reliability

Our approach to the reliability grading assessment has combined our existing knowledge and analysis of the MUC process gained in previous years with a review of changes that have occurred to the process in year. Our key source of information is the MUC handbook and evidence of its utilisation.

Process changes

The low reliability confidence grading, of DX, that we gave Network Rail in 2012/13 was because data corruption meant that it was unable to provide complete "week 3" data for the whole year, which had been a key evidence source for our audit process. Network Rail informed us that it was likely that it would change the MUC process during the 2013/14 financial year to remove the week 3 data check as it considered it unnecessary and the benefit it gave was offset by the complexity it added to the process. We agreed that if Network Rail could provide evidence that supported this position and that such a change followed a properly controlled process then this was unlikely to affect the reliability score in the 2013/14 audit. Network Rail's own change request process, as set out in section

2.4.2 of the MUC Manual, states: "Where the working group recommend a change request[42] to be implemented, they will provide their feedback along with an impact analysis and a communication plan, to be handed over to the MUC Steering Group for sign-off."

During this audit Network Rail has supplied the following email evidence showing the communication of the week 3 data check change that it undertook:

Date	Sent to	Description
4 October 2013	Route finance directors and controllers, Route finance directors and controllers, Route infrastructure maintenance directors and infrastructure maintenance delivery managers.	Email informing addressees of an intention to bring forward the timing of periodic information from week 3 to week 1. More details to follow.
7 October 2013	Route finance directors and controllers, Route finance directors and controllers, Route infrastructure maintenance directors and infrastructure maintenance delivery managers.	Email stating that the Maintenance Unit Cost Working Group have drafted a proposal to close Ellipse period end reporting in week 1 in place of week 3. This email sought feedback regarding this change so that "we do not cause any material reporting issues in other areas." The email identified pros and cons surrounding the current process and the proposed new process. One of the pro's states "DUs have 2 weeks after the flash results to revise their numbers. However analysis between WK1 and WK3 movements shows minimal activity." The message also says that if no response has been received by 11th October then they will assume that addresses are in favour of the changes and don't have

[42] Changes may include changes to the MUC framework including new standard jobs or new plant/technology, and changes to policy, processes and standards.

Date	Sent to	Description
		any concerns. Feedback was received from 7 finance and/or maintenance teams (out of 40 DUs).
15 October 2013	Route finance directors and controllers, Route finance directors and controllers, Route infrastructure maintenance directors and infrastructure maintenance delivery managers.	Email states that on balance all are in favour of the change so it will go ahead with the week 1 report to be run this evening.
16 October 2013	Route finance directors and controllers, Route finance directors and controllers, Route infrastructure maintenance directors and infrastructure maintenance delivery managers.	Email confirming that the change has been successful.

Although the email dated 7 October states that analysis has been carried out which showed minimal activity to correct errors in MUCs between week 1 and week 3, this evidence has not been provided to us. No other quantification of the impact of this change has been provided. In addition, we consider that the eleven day period between communication of the intention to make a change and its implementation is unduly short, particularly when considering that the central finance team sought feedback on the proposal in this time before deciding to make their change and that there was no urgent driver for change. During our meeting to discuss the MUC audit, Network Rail said that their exception report which it introduced as a control to identify potential data errors in place of the week 3 data check, had identified approximately 20,000 exceptions out of approximately 6,000,000 work orders, a very low exception rate of 0.3%. However, we have not received this analysis and so have not been able to verify this claim.

MUC Handbook

We have undertaken a review of the MUC Manual focusing on the issues that we raised during the 2012/13 audit. There is clear evidence that the document has been reviewed and updated. Many of the changes appear to have been made in response to the shortcomings we raised in our review last year. For example, Network Rail has updated process charts and increased the usability of the document as a whole. However, a number of inconsistencies between the processes that actually occur and how they are documented in the manual still remain to be addressed. Network Rail told us that information on MUCs, including the handbook, is now available on its intranet to ensure that it is accessible to everyone who requires it.

Furthermore, we believe that there are errors within the 2013/14 MUC data which the week 3 data check would have identified. On MNT043, we note that 65% of the reported volume (43.5 million of 67.2 million units) was recorded by one area in period 6 which is a significant anomaly with data reported on this code across the rest of the network. We have factored this error into our accuracy analysis below.

Accuracy

In the past, our accuracy grading approach has been based on an analysis of Business Objects files containing week 1 and week 3 data for each period. The removal of the week 3 data set means that this analysis is no longer possible in its previous format. Instead, week 1 data has been used for the analysis with a change in the method for calculating the 5% Error Non-Correction measure, as explained below. We have combined the following calculations to derive an estimation of the overall accuracy level of the MUC data for each respective MNT code:

- **YTD variance** – analysis of variance between Year To Date (YTD) and baseline unit cost values,
- **Period variance** – variance between period and baseline unit cost values for each route for each period,
- **Costs With No Units** – review of proportion of Week 1 figures that have a cost associated with them but no volume of work recorded,
- **Units With No Costs** – review of proportion of Week 1 figures that have a work volume recorded but no cost and
- **5% Error non-correction** – This measure has been changed as it is no longer possible to identify errors by comparing week 1 and week 3 reports. Instead, each MNT Code within each Delivery Unit was compared to the previous period's figures and any negative[43] amount of either cost or units considered to be an error correction. These errors were then summed for each MNT Code and the unit cost uplifted by a rate of 5%[44] of the error. The result is an estimate reflecting the total impact in accuracy terms of uncorrected errors.

For each of the above calculations, the resulting figure for the given MNT code is correlated to an accuracy score, the logic of which corresponds to the accuracy scoring component of the Confidence Grading. The above indicators are then averaged out, via a rounding formula. Full details of our MUC Confidence Grading methodology are set out in Appendix F.

[43] We are aware that changes to the labour rate were made in Period 8 and backdated throughout the financial year which may have resulted in a reduction in costs. Therefore any negative costs in Period 8 have not been included in this calculation.
[44] Assuming that 1 out of every 20 errors (i.e. 5%) goes uncorrected.

8.3 MUC confidence grading – results

8.3.1 Reliability

We set out in the table below the results of our Reliability Grading. Because the formulation process is the same for all MUCs, the reliability grading applies to all MNT codes.

Reliability Band	Description	Comments
A	Sound textual records, procedures, investigations or analysis properly documented and recognised as the best method of assessment. Appropriate levels of internal verification and adequate numbers of fully trained individuals.	We consider the MUC process is documented to a satisfactory level and Network Rail has addressed many of the errors/inconsistencies that we identified last year. There is also evidence of a high level of ownership of the MUC handbook. The profile of MUCs within Network Rail is much greater than in previous years. The reliance on average figures for material and labour costs raises questions over whether the MUC process can be described as best practice. Given the data Network Rail record we think it should be possible to use actual labour costs rather than average rates, although we acknowledge that the granularity of these averages, which are now at DU rather than national level, has been greatly improved. Given the challenges faced by Network Rail, which often bulk purchases materials, the technique to factor materials costs into the MUC calculations is the most practical method. However, we do not consider the level of process change control that is currently in place, including quantification and verification of the impact of changes, to be sufficient as demonstrated by the speed and lack of supporting analysis when the week 3 data check was removed. Therefore we cannot suggest Network Rail is operating at this level.
B	**As A, but with minor shortcomings. Examples include old assessment, some missing documentation, insufficient internal verification, undocumented reliance on third-party data.**	**We consider that the significant shortcomings previously identified through our reviews have been addressed by Network Rail, along with many of the minor shortcomings.** **Previous concerns surrounding the lack of design documentation and the appropriateness of the MUC handbook have also been addressed.** **We consider this to be the level at which Network Rail is operating.**

Reliability Band	Description	Comments
C	Some significant shortcomings in the process which need urgent attention.	
D	Major shortcomings in all aspects of KPI: process unfit for purpose	

Table 36: MUC Reliability Grading results.

8.3.2 Accuracy

We set out in the table below the results of our accuracy grading analysis by individual MNT codes.

MUC code	Activity Description	Reliability Score	Accuracy Score
MNT004	Plain Line Tamping	B	2
MNT006	Manual Wet Bed Removal	B	2
MNT010	Replacement of S&C Bearers	B	2
MNT011	S&C Arc Weld Repair	B	1
MNT013	Level 1 Patrolling Track Inspection	B	2
MNT015	Weld Repair of Defective Rail	B	2
MNT016	Installation of Pre-Fabricated IRJs	B	2
MNT020	Manual Reprofiling of Ballast	B	2
MNT026	Replenishment of Ballast Train	B	3
MNT027	Maintenance of Rail Lubricators	B	1
MNT029	Replacement of Pads & Insulators	B	1
MNT030	Maintenance of Longitudinal Timber	B	2
MNT032	CWR - Stressing	B	2
MNT039	Manual Spot Re-sleepering (Concrete)	B	2
MNT041	Manual Ultrasonic Inspection - (PL)	B	2
MNT042	Manual Ultrasonic Inspection - (S&C)	B	2
MNT045	Rail Changing - CWR - Renew (Defects)	B	2
MNT047	Rail Changing - Jointed Rail - Renew (Defects)	B	2
MNT120	S&C - Renew crossing	B	2
MNT123	S&C Renew Half Set of Switches	B	2
MNT125	Track Inspection (Other)	B	2
MNT128	Lift & Replace Level Crossing for PWAY	B	2
MNT150	Signalling Cables	B	2

MUC code	Activity Description	Reliability Score	Accuracy Score
MNT155	Point End Routine Maintenance non Powered	B	2
MNT156	Point End Routine Maintenance Powered	B	1
MNT170	Vegetation Management (Manual)	B	2
MNT207	Maintain CRE Cables	B	3
MNT210	Maintain Non-Traction Power Supplies	B	2
MNT211	Maintain OHL Components	B	2
MNT212	Maintain Points Heating	B	2

Table 37: MUC Confidence Gradings by MNT code.

As shown in the table above, nominal accuracy scores vary from "1" (accuracy of ±1%) to "3" (accuracy of ±10%) for the MUCs shown in Statement 14.

The distribution of Accuracy grades has changed annually between 2010/11and 2013/14 as shown in the table overleaf.

Accuracy Band	Number of MNT codes			
	2010/11	2011/12	2012/13	2013/14[45]
1	5	2	24	14
2	19	28	56	58
3	21	18	25	28
4	5	2	0	8

Table 38: Distribution of Accuracy Grades

Note to table: 2012/13 grades are indicative as Network Rail was unable to provide requested data for the whole year to allow a more definitive assessment to be completed within the timescale for the review.

It can be seen that there was a significant improvement in the accuracy across the MNT codes between 2010/11 and 2012/13. However, there has been a deterioration in the levels of accuracy between 2012/13 and 2013/14.

The greatest factor contributing to this deterioration is the results of our analysis of the variance between actual and baseline forecast unit cost for both the YTD and period. We believe that this may be the result of inaccurate forecasting, which in itself does not affect the accuracy of unit cost data but is an indicator of the overall cost control environment within Network Rail. For example, for MNT041 the baseline differed substantially from the volume of work which was consistently recorded across areas and periods, suggesting to us that there was an error in the baseline unit recorded.

[45] Method of calculating Accuracy Grade changed due to the removal of the Week 3 error check from the MUC process.

However, Network Rail has changed the volume of work it reported on this code from 57.1 million units to 32.5 thousand units[46], which has had the effect of increasing the unit cost substantially.

Summary accuracy grading

We have provided a summary accuracy grading for the MUC figures, based on our overall assessment of MUC accuracy. This is set out in the table overleaf.

[46] The difference occurs between Period 13 data we were provided with for our review on 8 and 9 May 2014, and the draft regulatory statements and REEM figures provided by Network Rail on 30 and 27 June 2014.

Accuracy Band	Description	Comments
1	Calculation processes automated (to a degree commensurate with dataset size); calculations verified to be accurate and based on 100% sample of data; external data sources fully verified. KPIs expected to be accurate to within ±1%.	Calculation processes are automated and the number of opportunities for error due to manual entry of data has been greatly reduced. Inaccuracies relating to the use of a national labour rate have been reduced by increasing the granularity of the labour rate down to Delivery Unit level. This will still be a cause of inaccuracy but the magnitude of such an error is currently unknown. Our analysis has shown that there have been a significant number of negative costs and quantities of work entered each period. This, when taken together with the lack of impact analysis of the removal of the week 3 error correction report, a quality control mechanism, from the process, raises questions as to the accuracy of source data entry.
2	**KPIs expected to be accurate to within ±5%.**	**Based on the scale of errors identified through our nominal assessment of accuracy by individual MNT code and the issues raised in the Accuracy Band 1 comments above, we consider this to be the level at which Network Rail is working at.**
3	Shortfalls against several attributes: e.g. significant manual input to calculations or incomplete data verification or less than 100% sampling used. KPIs expected to be accurate to within ±10%.	
4	KPIs expected to be accurate to within ±25%.	
5	KPIs unlikely to be accurate to within ±25%.	
X1	KPI is calculated on a very small sample of data.	
X2	Accuracy cannot be assessed for some other reason.	

Table 39: Summary Accuracy Grading for MUC data.

8.3.3 MUCs reported in Statement 14

As in previous years Network Rail has included maintenance overhead costs incurred at its head office and non-productive hours in the MUC data that it has reported in Statement 14. In total it has apportioned overheads of £25 million across its 108 MUC codes, of which it reports 30 in Statement 14. The MUC handbook states that overheads are apportioned according to total spend on each MUC, at a route level, while non-productive hours are apportioned according to the labour hours recorded on each MUC. We have been unable to verify this apportionment but Network Rail provided to us with an example showing the allocation of overheads for MNT004, Plain Line Tamping, for Scotland.

8.4 Reporter opinion

Our assessed confidence grading for the MUCs presented in Network Rail's 2013/14 regulatory accounts is B2, an improvement in reliability on the previous year's assessment of DX2.

We consider that Network Rail has continued to improve the focus and priority that it gives to MUCs across its business, as demonstrated by the changes it has made to improve the usability of its MUC handbook. However, we have not assessed Network Rail as achieving an A in reliability because we consider that the process by which it removed the week 3 data report did not meet best practice. Network Rail has not provided any analysis to support their assertion that the week 3 data was no longer required. The central finance team also implemented the change very rapidly meant that areas of the business did not have much time to raise any concerns they had. We note that very few replied to the e-mail consultation that was carried out.

We have calculated an average accuracy score of 2 for the unit costs of individual MNT codes, the fourth consecutive year that Network Rail has achieved this score. We consider that it should be within Network Rail's capability to achieve an accuracy grade of "1" across all its MNT codes. Instead there has been a deterioration in the accuracy scores between 2012/13 and 2013/14, with fewer MNT codes achieving a "1" grading. We believe that this may be due to inaccurate forecasting which demonstrates weaknesses in the overall cost control environment within Network Rail, although we recognise that forecast data does not form part of the MUC calculation.

9 RUC (Renewals Unit Cost) Confidence Grading Analysis

9.1 Introduction and background

In this chapter we present the results of our confidence grading analysis for Renewals Unit Costs (RUCs), as presented in Statement 15, based on the grading definitions which are presented in Appendix F. Network Rail reports RUCs for four asset categories: track, signalling, civils and telecoms.

9.2 Approach and scope

Network Rail has stated that it considers the scope of this confidence grading assessment should be limited to a review of the high level arithmetic calculation presented in Statement 15, on the basis of which the RUC figures are formulated. The scope of this assessment is the limited to a high-level review to verify that the arithmetic calculation of total cost divided by volume is equal to the unit cost.

We note that the underlying expenditure and volume data supporting the RUC numbers are subject to separate reviews / audits. Expenditure figures are part of PwC's annual statutory audit of Network Rail's financial accounts. Volume reporting has been the subject of a number of previous reviews by the Independent Reporter; the most recently completed review, from 2012/13 awarded a confidence grading of B1 for track and telecoms, and B2 for signalling and civil engineering renewals work.[47]

Our work on RUCs is considerably more limited in scope to the work we perform on Maintenance Unit Costs (see the previous section). In previous years, Network Rail has indicated that a more detailed analysis of underlying source data on RUCs would not be meaningful because it does not monitor or report RUCs throughout the year.

9.3 Results of confidence grading analysis

Reliability

The RUCs are based on a simple arithmetic calculation undertaken by Network Rail's central finance team. This involves simply dividing the total renewal cost attributed to each asset renewal line item in Statement 15 by the volume reported for the same item, in order to derive the renewal unit cost.

This calculation process is described in Network Rail's RUC handbook. Both the total cost and the volume figures for each line item are shown in Statement 15, alongside the resulting RUC figure. We note that for this year's review we have not been provided with an updated version of the RUC handbook; we have therefore assumed that the guidance set out in the version of the handbook provided for last year's (2012/13) review remains valid for this year's numbers.

[47] Mandate AO/046: Audit of Renewal Volumes Data 2012/13, 18 July 2014.

On this basis, we consider the reliability grading for the RUCs to be **A**.

Accuracy

We have re-performed the unit cost calculation with volume and total expenditure data presented in Statement 15. This work has identified that there are no errors in the calculation although the high level data means that some unit costs agreed to an accuracy of 2 significant places. We therefore consider the accuracy grading for the RUCs to be **1**.

9.4 Reporter opinion

We have awarded a confidence grading score for the RUCs of **A1**, based on the calculation of expenditure divided by volume reported in Statement 15.

As was the case last year, we do not consider this simple analysis of the RUCs to have yielded any significant findings or insights for Network Rail or the ORR. We would recommend the reports / outputs of the relevant audits undertaken by PwC on the cost accounting side and Arup on the volume reporting side be reviewed in order to gain more meaningful insights into the source data feeding into the RUC calculation.

10 Regulatory Accounts Statements Data Review

10.1 Introduction

We set out in this chapter our review of the following specific statements within the Regulatory Accounts, and their consistency with other documents provided by Network Rail:

Statement 8b parts (1) and (2) - Analysis of maintenance expenditure and headcount by MDU

Statement 9b - Detailed analysis of renewals expenditure

Statement 12 - Analysis of efficiency (Real Economic Efficiency Measure)

Statement 13 - Volume Incentives

Statement 14 – Maintenance Unit Costs

Statement 15 - Renewals unit costs and coverage

10.2 Statement 8b parts (1) and (2) - Analysis of maintenance expenditure and headcount by MDU

We summarise our review of Statement 8b (part 1) in line with mandate requirements below.

Review Area	Arup Assessment
The breakdown of spend by MDU is consistent with the remainder of the regulatory accounts	The breakdown of spend is consistent with the expenditure reported in statement 8a which has been checked by PwC. There is an immaterial difference between the information reported in statement 8b and the maintenance expenditure used for the REEM calculation, with the value in statement 8b £ 7 million higher. This is due to a £5 million reclassification in cost from operating to maintenance costs which was not incorporated in the REEM and £2 million un-reconciled difference.
The amounts of spend by MDU agrees to the underlying accounting records and have been correctly extracted	The breakdown of spend is consistent with the expenditure reported in statement 8a which has been checked by PwC. There is a small difference between the information reported in statement 8b and the maintenance expenditure used for the REEM calculation, with the value in statement 8b £ 7 million higher.
Where costs or headcounts have been allocated that this allocation has been made on a reasonable basis and any other estimate used is reasonable	Headcount and cost data are extracted directly from Network Rail's financial reporting system, Hyperion. The figures in statement 8b reconcile to extracts from the system.
The headcount has been correctly extracted from the underlying records and that any estimates used are reasonable	We have requested underlying headcount data from Network Rail so that we are able to confirm this.
The sub-totals and totals in the table down cast and cross cast	The statement casts and cross-casts.
The disaggregated amounts for England and Wales and Scotland add up to the Great Britain amounts	The total for Great Britain agrees to the sum of expenditure in England and Wales and in Scotland.
Network Rail's narrative on the table is reasonable and details set out in the commentary agree to the underlying accounting records or other supporting documentation	The narrative in the statement seems reasonable, with key variances explained in headcount and expenditure.

Table 40: Review of Statement 8b (parts 1 & 2)

10.3 Statement 9b - Detailed analysis of renewals expenditure

We summarise our review of Statement 9b in line with mandate requirements below.

Review Area	Arup Assessment
The breakdown of spend by asset category by total is consistent with the remainder of the regulatory accounts	The breakdown of spend is consistent with the expenditure reported in statement 9a which has been checked by PwC. Network Rail has provided us with a reconciliation showing how expenditure figures presented in this statement agree to the data we have reviewed in detail for the REEM efficiencies in Statement 12. Differences are due to accelerated works which were not included in the PR08 baseline, efficient overspend and reclassification of costs.
The amounts of spend by asset type agree to the underlying accounting records and have been correctly extracted	The breakdown of spend is consistent with the expenditure reported in statement 9a which has been checked by PwC.
Where costs have been allocated between categories that this allocation has been made on a reasonable basis and any other estimate used is reasonable	Network Rail has provided us with a reconciliation showing how expenditure figures presented in this statement agree to the data we have reviewed in detail for the REEM efficiencies in Statement 12.
The sub-totals and totals in the table down cast and cross cast	With the exception of the PR08 and Difference columns, the tables cast and cross-cast. The information for the PR08 column is inconsistent across different assets because information is unavailable for some assets. This is explained in the note to the table.
The disaggregated amounts for England and Wales and Scotland add up to the Great Britain amounts	The amounts for England and Wales and Scotland equal the total for Great Britain.
Network Rail's narrative on the table is reasonable and details set out in the commentary agree to the underlying accounting records or other supporting documentation	We consider the narrative accompanying the table to be largely reasonable and consistent with the information we have received to support our review of the REEM efficiency figures. We query the figure of £150million of accelerated signalling work from CP5 as the evidence we have received suggests this value should be £103 million.

Table 4: Review of Statement 9b

10.4 Statement 12 - Analysis of efficiency (Real Economic Efficiency Measure)

We summarise our review of Statement 12 in line with mandate requirements below.

Review Area	Arup Assessment
Network Rail has clearly documented policies for the recognition of efficiencies.	We comment on Network Rail's REEM handbook in section 3.2.
Network Rail has clearly documented processes for calculating efficiencies within which assumptions are clearly laid out and which demonstrate consistency with policies documented.	Network Rail's policies are documented in the REEM handbook, which we comment upon in section 3.2. It sets out how efficiencies should be calculated, supported by evidence of positive management actions and the need for the sustainability of efficiencies to be demonstrated.
Network Rail's calculation of its real economic efficiency measure is in accordance with its policies and is reasonable. This should include an assessment of whether the data used to calculate the measures is accurate, of a sufficient quality and consistent with the purpose of the measures.	We review Network Rail's REEM efficiency calculations, including the robustness of underlying data, within chapters 4 to 7 of this report.
The breakdown of variances between actual and PR08 assumed renewals expenditure between deferral and efficiency is reasonable.	We review the breakdown between renewals and deferral, on an asset by asset basis, in chapter 7.
Efficiency savings that have been recognised have been achieved on a sustainable basis.	We report on the sustainability of efficiency savings in chapters 4 to 7.
The amounts of expenditure used in the efficiency calculation have been correctly extracted from the underlying accounting records.	We comment on Network Rails' approach to calculating efficiencies in section 3.3, and the provenance of expenditure data in chapters 4 to 7 of this report. We place reliance on the work of PwC in their audit of the statutory financial statements that reported expenditure, which we have reconciled to data used for the REEM statements, is free from material error.
The baselines used are the ones agreed by the ORR.	We review the baselines underpinning the REEM calculation in chapters 4 to 7 of this report.

Review Area	Arup Assessment
The sub-totals and totals in the table down cast and cross cast.	Tables cast and cross-cast.
The disaggregated amounts for England and Wales and Scotland add up to the Great Britain amounts.	The disaggregated amounts for England and Wales and Scotland add up to the totals for Great Britain.
Network Rail's narrative within the statement is reasonable and agrees with the details set out in the narrative to the underlying supporting documentation.	We comment on the evidence Network Rail has provided us with to support its REEM efficiencies within chapters 5 to 7.
Network Rail's documented explanations of the positive management actions which have resulted in efficiencies are reasonable and that the details set out in the explanations are consistent with the underlying accounting records or other supporting documentation.	We comment on the evidence Network Rail has provided us with to support its REEM efficiencies within chapters 5 to 7, including how PMAs have been identified, calculated and the extent to which they cover the reported efficiencies.
The internal analysis, challenge and reporting ensures that the breakdown of efficiencies between scope and unit cost is sufficiently accurate and that Network Rail can adequately explain movements from the previous year. and	We comment on the governance of the efficiency reporting process in section 3.4 of this report.
The reporter should also briefly review Network Rail's progress with respect to volume delivery for the year to date versus planned levels and any material risks or changes in approach by the business that may lead to volume delivery being over or under planned levels for the year in question.	This is the final year of the control period and we report on the volumes which Network Rail and ORR have agreed to defer to CP5.

Table 42: Review of Statement 12

10.5 Statement 13 - Volume Incentives

We summarise our review of Statement 13 in line with mandate requirements below.

Review Area	Arup Assessment
Network Rail's calculation of its performance on the volume incentive is in accordance with the PR08 determination. This should include an assessment of whether the data used to calculate the measures is accurate, of a sufficient quality and consistent with the purpose of the measures. To achieve this, Arup will coordinate as appropriate with the Independent Auditor (PwC).	The only volume metric which has triggered an incentive payment is passenger train miles. The calculation methodology is consistent with that used in prior years and agrees with the method used by ORR[48].
Where income or costs have been allocated that this allocation has been made on a reasonable basis and any other estimate used is reasonable	Volume data for the calculation appears to have been extracted directly from Network Rail's train performance database.
The sub-totals and totals in the table down cast and cross cast	The table casts and cross-casts
The disaggregated amounts for England and Wales and Scotland add up to the Great Britain amounts	The disaggregated amounts for England and Wales, and Scotland, add up to the total for Great Britain.
Network Rail's narrative on the table is reasonable and the details set out in the commentary agree to the underlying accounting records or other supporting documentation	The narrative is in line with the PR08 determination and the figures presented in the statement

Table 43: Review of Statement 13

[48] According to Volume_incentive_calculations_for_Network_Rail.xls provided to us for the 2010/11 Regulatory Financial Statements review.

10.6 Statement 14 – Maintenance Unit Costs

We summarise our review of Statement 14 in line with mandate requirements below.

Review Area	Arup Assessment
The unit costs have been calculated in accordance with the company's unit cost handbook	Our review of the process Network Rail has used to calculate the MUCs is set out in chapter 8 of this report.
The information to calculate the unit costs has been correctly extracted from the underlying accounting records and that any estimates used are reasonable	Our review of the underlying information used to calculate the MUCs is set out in chapter 8 of this report.
Where applicable the sub-totals and totals in the table down cast and cross cast	All statement 14 tables cast and cross-cast
Where applicable the disaggregated amounts for England and Wales and Scotland add up to the Great Britain amounts	Data reported for England and Wales, and for Scotland, sums to the amounts reported for Great Britain as a whole, with small adjustments to ensure tables cast and cross-cast.
Network Rail's narrative on the table is reasonable and the details set out in the commentary agree to the underlying accounting records or other supporting documentation	The brief comments accompanying the statement are reasonable and in line with the information we have reviewed.

Table 44: Review of Statement 14

10.7 Statement 15 - Renewals unit costs and coverage

We summarise our review of Statement 15 in line with mandate requirements below.

Review Area	Arup Assessment
The unit costs have been calculated in accordance with the company's unit cost handbook	The calculation method and reported asset categories for RUC are consistent with prior years. We are not aware of any updates to the Renewals Unit Cost handbook.
The information to calculate the unit costs has been correctly extracted from the underlying accounting records and that any estimates used are reasonable	We have placed reliance upon the work of PwC that expenditure data has been correctly extracted from the general ledger. We have also confirmed that expenditure reconciles to the REEM efficiency data we have reviewed once accelerated works and reclassified expenditure has been taken into account. We are unable to confirm that volume data has been correctly extracted because no review of volume reporting is planned for 2013/14 on which we have previously placed reliance.
Where applicable the sub-totals and totals in the table down cast and cross cast	All Statement 15 tables cast and cross-cast.
Where applicable the disaggregated amounts for England and Wales and Scotland add up to the Great Britain amounts	Data reported for England and Wales, and for Scotland, sums to the amounts reported for Great Britain as a whole.
Network Rail's narrative on the table is reasonable and the details set out in the commentary agree to the underlying accounting records or other supporting documentation	The narrative explaining unit costs and volumes is reasonable, and in line with the information we received from our review of the REEM efficiency statement.

Table 45: Review of Statement 15

Appendix A: Regulatory accounts data assurance reporter mandate AO/048

Background

This mandate sets out the requirements for the independent reporter's review of sections of the regulatory financial statements of Network Rail for the year ended 31 March 2014, which comprise:

Statement 8b – Analysis of maintenance expenditure by MDU;
Statement 9b – Detailed analysis of renewals expenditure;
Statement 12 – Analysis of efficiency (Real Economic Efficiency Measure);
Statement 13 – Volume incentives;
Statement 14 – Unit costs;
Statement 15 – Renewals unit costs and coverage;

Strategic objective

The strategic objective of this independent reporter review is to determine the reliability and accuracy of the information presented in certain sections of Network Rail's regulatory financial statements set out within this mandate. In particular, given the importance of the issues raised in Network Rail's reporting of efficiencies in previous reviews, the reporter should assess the degree to which Network Rail's reporting has improved, highlight continuing uncertainties and specify any further improvements that should be made for efficiency reporting.

Directors' review and management commentary

The reporter will review whether Network Rail's explanations in its director's review and in the commentary on the statements within the regulatory financial statements listed above of the variances between actual efficiency and unit costs and those assumed in its 2013-14 budget, CP4 delivery plan, and the ORR's PR08 determination are reasonable.

Statement 8b (parts 1 and 2) – Analysis of maintenance expenditure by MDU

The reporter will review Statement 8b of the regulatory financial statements for Great Britain, England & Wales and Scotland, to confirm whether:

1. the breakdown of spend by MDU is consistent with the remainder of the regulatory accounts;
2. the amounts of spend by MDU agrees to the underlying accounting records and have been correctly extracted; and
3. where costs or headcounts have been allocated that this allocation has been made on a reasonable basis and any other estimate used is reasonable;
4. the headcount has been correctly extracted from the underlying records and that any estimates used are reasonable;
5. the sub-totals and totals in the table down cast and cross cast;

6. the disaggregated amounts for England and Wales and Scotland add up to the Great Britain amounts; and
7. Network Rail's narrative on the table is reasonable and details set out in the commentary agree to the underlying accounting records or other supporting documentation.

Statement 9b – Detailed analysis of renewals expenditure

The reporter will review Statements 9a and 9b to confirm whether:

1. the breakdown of spend by asset category by total is consistent with the remainder of the regulatory accounts;
2. the amounts of spend by asset type agree to the underlying accounting records and have been correctly extracted;
3. where costs have been allocated between categories that this allocation has been made on a reasonable basis and any other estimate used is reasonable;
4. the sub-totals and totals in the table down cast and cross cast; and
5. the disaggregated amounts for England and Wales and Scotland add up to the Great Britain amounts; and
6. Network Rail's narrative on the table is reasonable and details set out in the commentary agree to the underlying accounting records or other supporting documentation.

Statement 12 – Analysis of efficiency (Real Economic Efficiency Measure)

The reporter will review the Statement 12 efficiency statements for Great Britain, England & Wales and Scotland to confirm whether:

1. Network Rail has clearly documented policies for the recognition of efficiencies;
2. Network Rail has clearly documented processes for calculating efficiencies within which assumptions are clearly laid out and which demonstrate consistency with policies documented under (1.);
3. the breakdown of variances between actual and PR08 assumed renewals expenditure between deferral and efficiency is reasonable;
4. efficiency savings that have been recognised have been achieved on a sustainable basis;
5. the amounts of expenditure used in the efficiency calculation have been correctly extracted from the underlying accounting records;
6. the baselines used are the ones agreed by the ORR;
7. the sub-totals and totals in the table down cast and cross cast;
8. the disaggregated amounts for England and Wales and Scotland add up to the Great Britain amounts;
9. Network Rail's narrative within the statement is reasonable and agrees with the details set out in the narrative to the underlying supporting documentation.
10. Network Rail's documented explanations of the positive management actions which have resulted in efficiencies are

reasonable and that the details set out in the explanations are consistent with the underlying accounting records or other supporting documentation;

11. the internal analysis, challenge and reporting ensures that the breakdown of efficiencies between scope and unit cost is sufficiently accurate and that Network Rail can adequately explain movements from the previous year; and

Statement 13

The reporter will review Statement 13 of the regulatory financial statements for Great Britain, England & Wales and Scotland, together with the statements broken down by operating route, to confirm whether:

1. Network Rail's calculation of its performance on the volume incentive is in accordance with the PR08 determination. This should include an assessment of whether the data used to calculate the measures are accurate, of a sufficient quality and consistent with the purpose of the measures. To achieve this, Arup will coordinate as appropriate with the Independent Auditor (PwC);
2. where income or costs have been allocated that this allocation has been made on a reasonable basis and any other estimate used is reasonable;
3. the sub-totals and totals in the table down cast and cross cast;
4. the disaggregated amounts for England and Wales and Scotland add up to the Great Britain amounts;
5. the disaggregated amounts broken down by operating route add up to the Great Britain amounts; and
6. Network Rail's narrative on the table is reasonable and the details set out in the commentary agree to the underlying accounting records or other supporting documentation.

Statements 14 and 15

The reporter will review Statements 14 and 15 of the regulatory financial statements for Great Britain, England & Wales and Scotland. The reporter will assess the accuracy and reliability of each reported unit cost in accordance with its confidence grading system, in particular whether:

a) the unit costs have been calculated in accordance with the company's unit cost handbook;
b) the information to calculate the unit costs has been correctly extracted from the underlying accounting records and that any estimates used are reasonable;
c) where applicable the sub-totals and totals in the table down cast and cross cast;
d) where applicable the disaggregated amounts for England and Wales and Scotland add up to the Great Britain amounts; and
e) Network Rail's narrative on the table is reasonable and the details set out in the commentary agree to the underlying accounting records or other supporting documentation.

This assessment will identify how the quality of data in 2013-14 compares to previous years where appropriate.

Deliverables:

- Year-end report – this will cover the entire mandate.

Delivery dates:

- Initial year-end draft report issued by [Friday, 30 May 2014]
- Draft year-end final report issued by [Friday, 20 June 2014]
- Final year-end report issued by [Friday, 27 June 2014]

Appendix B: Review of progress in relation to previous recommendations

Ref.	Previous recommendation to Network Rail	Review of progress – 2011/12 and 2012/13 regulatory accounts review	Review of progress during 2013/14
2011. RA.11 **[IR]**	We recommend that Network Rail provide analysis which monitors progress towards delivering planned volumes over the duration of the Control Period, for each asset category. This analysis should show the implications of any deferrals for outputs / volumes to be delivered over the rest of the Control Period.	**Limited progress**: We have suggested that the ORR and Network Rail will need to consider in detail the volumes delivered for the majority of renewals categories at future reviews. Network Rail has reported that the volumes planned for the final two years of CP4 are deliverable. Detailed examination of track, signalling, civils, telecoms, buildings, E&P and PM delivery will be necessary to ensure the company will not defer work into CP5. We note, in relation to this recommendation, the following comment from Network Rail: "NR does not agree that delivery or otherwise of indicative volumes for the remainder of the control period is of itself relevant to efficiency claimed for the year being reported on. NR has instead demonstrated the sustainability of its asset management, including understanding the potential impact of work deferred in the year. NR will not be taking any further action on this recommendation." (Received 5th July 2012).	**No further progress.**
2011. RA.12 **[IR]**	In line with the ORR's 2006 guidance on the monitoring and treatment of underspend, we recommend that Network Rail provide a commentary on deferred expenditure, for each asset category. This should be supported by evidence that the	**Limited progress**: Network Rail has provided more detailed evidence related to the robustness and sustainability of its expenditure reductions for several asset areas. Formal written evidence, in the form of asset management reports monitoring KPI performance, change controls and delivery plans relative to the efficiency Network Rail has reported would aid future reviews. We note, in relation to this recommendation, the following comment from Network Rail: "NR does not agree with the interpretation put forward by Arup. As part of the year end	**No further progress.**

Ref.	Previous recommendation to Network Rail	Review of progress – 2011/12 and 2012/13 regulatory accounts review	Review of progress during 2013/14
	deferrals are both robust and sustainable, as defined in the ORR's letter of June 2010.	review, NR has provided a robust set of documentation demonstrating that the application of asset policies will maintain asset condition in the short, medium and long term. NR will not be taking any further action on this recommendation." (Comment received 5th July 2012).	
2011. RA.13 **[IR]**	Where Network Rail cannot offer satisfactory evidence of either the PMAs or sustainability of activities underlying the efficiencies it wishes to claim, we recommend that it should adopt a more prudent approach to its reporting. In practice, this may mean reflecting uncertainty by applying a degree of contingency, or reporting a range.	**No change**: Network Rail reports that it disqualifies efficiency which it finds cannot be supported by evidence of positive management action and/or asset sustainability and robustness. We conclude that Network Rail and the ORR should consider adopting formal methods for demonstrating prudence, including reflecting uncertainty by applying a degree of contingency, or reporting a range. We note, in relation to this recommendation, the following comment from Network Rail: "NR has already stated that the accounts on which the efficiency calculation is based are prepared on a prudent basis; that as REEM is a year on year comparison it is not appropriate to 'defer' efficiency recognition to a future year or control period; and that therefore no prudence adjustment will be made in the REEM calculation. NR will not be taking any further action on this recommendation." (Comment received 5th July 2012).	**No further progress.**
2011. RA.1 **[2010/2011]**	We recommend a fully systematic and comprehensive guide setting out how source data is developed for the CEM and REEM calculation processes.	**Significant progress**: Network Rail has developed an Efficiency Handbook, which sets out the calculation process and assumptions that form the basis for the CEM and REEM efficiency calculations. The Handbook includes an explanation of the nature of expenditure and the basis for efficiency calculation for each component of expenditure (opex, maintenance, renewals (by asset category)), descriptions of the type of expenditure in terms of activity / function, and an explanation of how respective baseline values are derived. Network Rail has explained that it has finalised the draft version of the Handbook used at	**No further progress.**

Ref.	Previous recommendation to Network Rail	Review of progress – 2011/12 and 2012/13 regulatory accounts review	Review of progress during 2013/14
		P06. We note, in relation to this recommendation, the following comment from Network Rail: "NR considers this action closed following the issue of the Efficiency Handbook." (Comment received 5th July 2012).	
2011. RA.2 **[2010/2011]**	We recommend the system of spreadsheets used to calculate the CEM [REEM] efficiency measure is re-organised and integrated to simplify the flow of data and linkage among them.	**Significant progress**: Network Rail has developed an integrated efficiency calculation model clearly setting out the REEM efficiency calculation inputs, formulae and outputs. An Excel spreadsheet provides an overview of the main expenditure elements, and calculations of efficiency (including a breakdown into volume and unit cost efficiency where applicable). Input cost and volume data are clearly identified. Network Rail has indicated that it plans to link expenditures (and volumes) directly to the Experion financial accounting system (although this measure has yet to be implemented). The labelling applied to the data fields appears sufficient as an audit trail. At P06, we suggested that Network Rail procure an independent audit of the REEM efficiency model, in line with industry best practice. Network Rail has said that it does not plan to do so, because it has checked its REEM spreadsheets internally. We note, in relation to this recommendation, the following comment from Network Rail: "NR considers this action closed following the creation and implementation of the REEM model." (Comment received 5th July 2012).	**No further progress.**
2011. RA.3 **[2010/2**	For non-reportable volume based renewal activities we recommend the disaggregation	**Significant progress**: NR has disaggregated the calculation of renewals efficiency for non-reportable volume based categories to facilitate efficiency calculations for each renewals expenditure category. A separate breakdown and explanation of efficiencies achieved for	**No further progress.**

Ref.	Previous recommendation to Network Rail	Review of progress – 2011/12 and 2012/13 regulatory accounts review	Review of progress during 2013/14
011]	of the renewals efficiency calculation by asset category. To provide a robust and auditable basis for efficiency calculations we consider it essential that outturn expenditure levels can be compared against a credible pre-efficient baseline value for every individual asset category.	each asset area has been provided. We note, in relation to this recommendation, the following comment from Network Rail: "NR considers this action closed as non volume efficiency has been calculated and substantiated on an asset by asset basis." (Comment received 5th July 2012).	
2011. RA.4 **[2010/2011]**	We recommend that the present level of unit cost coverage utilized for CEM purposes is increased through the incorporation of other asset categories for which the CAF unit cost framework is already utilized, including operational property, telecoms and electrification renewals.	**Limited progress:** Network Rail has indicated it will not be able to extend the level of renewals unit cost coverage, because it is unable to derive the necessary baseline volume and cost information that enable consistent baseline volume and unit cost rates, reflective of the position at the end of CP3 (2008/09), to be derived. We note, in relation to this recommendation, the following comment from Network Rail: "In view of the absence of a credible baseline, NR does not accept this recommendation and will not be taking any further action." (Comment received 5th July 2012).	**No further progress.**
2011. RA.5 **[2010/2**	We recommend that Network Rail improves the granularity of efficiency reporting for non-unit cost based asset categories,	**Moderate progress**: Network Rail's implementation of a more rigorous and structured efficiency reporting progress has included the requirement to report evidence of the impact of positive management actions in quantified terms for the given expenditure area. In a number of areas a greater level of granularity has been achieved, e.g. project-by-project	**No further progress.**

Ref.	Previous recommendation to Network Rail	Review of progress – 2011/12 and 2012/13 regulatory accounts review	Review of progress during 2013/14
011]	(i.e. categories that cannot be captured under the CAF framework (see RA.4)), through breakdown of given asset cost categories into sub-categories, to give greater visibility of the performance and efficiency levels for given asset categories.	reporting for electrification and telecoms, whilst for IM a breakdown into hardware / software/ system integrator sub-asset types has been introduced. We note, in relation to this recommendation, the following comment from Network Rail: "In view of the absence of a credible baseline, NR does not accept this recommendation and will not be taking any further action." (Comment received 5th July 2012).	
2011. RA.6 **[2010/2011]**	We recommend the implementation of a robust, documented procedure for the monitoring and analysis of unit cost efficiencies through which specific forward-looking efficiency targets are embedded into the efficiency reporting process.	Track renewals: **Moderate progress**: significant progress has been achieved, with baseline and target unit cost values clearly set out for both the unit cost categories. Forward-looking projections through implementation of particular measures have been developed. The P06 unit cost values were been monitored against the values, and the level of progress analysed. At year-end, it is clear that track asset management continues to monitor progress against unit rate values. Other expenditure categories: **Limited progress.** Although in some areas, the impact of positive management actions is set out, there is little evidence of forward-looking monitoring of unit cost efficiencies against a target trajectory. " We note, in relation to this recommendation, the following comment from Network Rail: "NR has previously rejected this recommendation as not relevant to historical efficiency reporting and will not be taking any further action." (Comment received 5th July 2012).	**No further progress.**

Ref.	Previous recommendation to Network Rail	Review of progress – 2011/12 and 2012/13 regulatory accounts review	Review of progress during 2013/14
2011. RA.8* **[2010/2011]**	To support the documented efficiency monitoring and analysis procedures set out under recommendations RA6 and RA7, we recommend that Network Rail develops specific tests / criteria setting out minimum requirements for the provision of "bottom-up", asset specific evidence through which declared efficiencies for each asset type / unit cost category are substantiated.	**Moderate progress**: Network Rail's Efficiency Handbook sets out criteria for the provision of evidence to support declared efficiencies that apply to all expenditure categories. Network Rail sets out requirements for evidence of positive management actions, and has developed a *pro forma* that must be completed by each asset team / function of the business overseeing the given asset areas. Network Rail's handbook also sets out requirements for provision of evidence to demonstrate the robustness and sustainability of the nature and volume of work undertaken. For some asset categories, such as signalling and civils renewals, we have suggested that Network Rail could improve the accuracy and/or granularity of its reporting through cost benchmarking (e.g. when Network Rail reports cost savings related to contract management). Network Rail again has said it does not agree with this recommendation. We note, in relation to this recommendation, the following comment from Network Rail: "NR has previously rejected this recommendation firstly because the concept is unworkable and secondly because REEM seeks to measure efficiency against a 2008/09 historic baseline and therefore comparison to historic or current benchmarks is irrelevant. NR will not be taking any further action on this recommendation." (Comment received 5th July 2012).	**No further progress.**
2011. RA.9 **[2010/2011]**	We recommend that Network Rail and the ORR explore options for alteration of the methodology by which volume efficiency is calculated in the CEM, to enable any	**Limited progress**: Network Rail is not proposing to alter the volume efficiency methodology on this basis. We note, in relation to this recommendation, the following comment from Network Rail: "NR has previously rejected this recommendation as not relevant to historical efficiency	**No further progress.**

Ref.	Previous recommendation to Network Rail	Review of progress – 2011/12 and 2012/13 regulatory accounts review	Review of progress during 2013/14
	uncertainties in relation to forward-looking / CP4 volumes, associated with deferral and deviation/slippage vs. plan, to be taken into account within the volume efficiency calculation.	reporting and will not be taking any further action." (Comment received 5th July 2012).	
2011. RA.10 **[2010/2011]**	We recommend that Network Rail and ORR review asset policies and how they influence and shape work banks. These may well have helped to reduce the level of uncertainty associated with the sustainability test on NR's asset policies that ORR performed previously.	**Significant progress**: Review by the Independent Reporter in progress.	**Significant progress**

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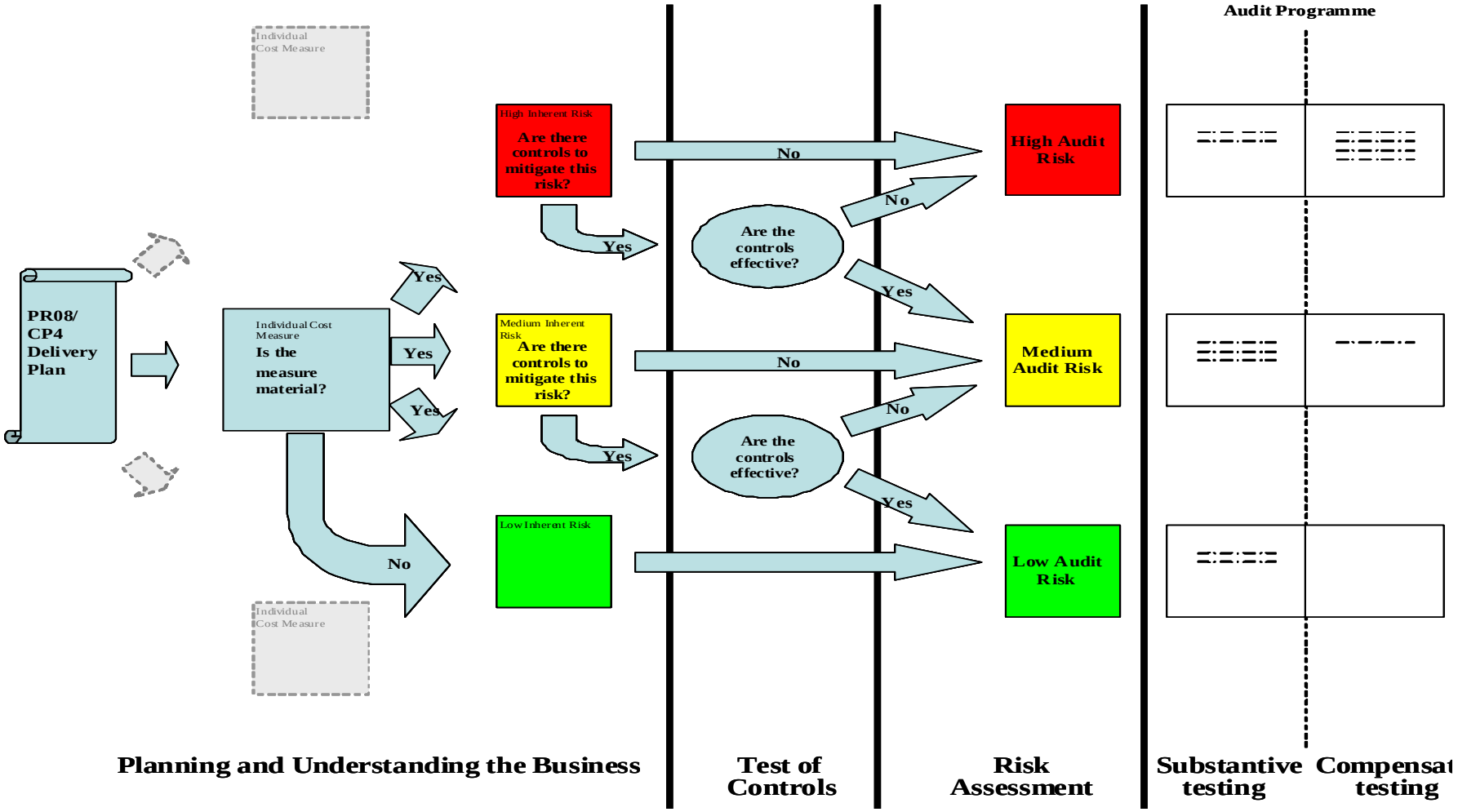
Appendix C: Risk-based approach

Underlying our methodology is a risk-based approach. This means we focus our review of the Regulatory Accounts based on how individual statements are likely to be used for the planning and regulation of Network Rail's business activities, and the inherent risk from an audit perspective that they represent. Areas of data where we perceive there is a high level of audit risk are subject to more detailed auditing and scrutiny. Critical aspects which have informed our judgement include a lack of visibility of key calculations, undocumented or unsubstantiated judgements or analysis, poor levels of data integrity and completeness, or distortion of overall results.

A diagrammatic overview of our risk-based approach is set out on the next page.


Audit Programme
Individual Cost Measure
High Inherent Risk
Are there controls to mitigate this risk?
No
High Audit Risk
No
Yes
Are the controls effective?
Yes
PR08/ CP4 Delivery Plan
Individual Cost Measure
Is the measure material?
Yes
Yes
Yes
Medium Inherent Risk
Are there controls to mitigate this risk?
No
Medium Audit Risk
No
Yes
Are the controls effective?
Yes
No
Low Inherent Risk
Low Audit Risk
Individual Cost Measure
Planning and Understanding the Business
Test of Controls
Risk Assessment
Substantive testing
Compensat testing

Appendix D: Meetings held to date

Subject	Date	Location	Present: Network Rail /Other	Present: Arup
Sustainable Asset Management	15/04/2014	Kings Place	Andrew Ballsdon, Ben Edwards, Mark Morris - ORR, Amanda Clark - ORR	Alexander Jan, Matthew Dillon, Bridget Jackson
Maintenance Unit Cost – Kick Off	29/04/2014	Kings Place	Rebecca Williams, Laura SavioFoster, Darrell Pascal, Robert Thomas, Matt Branson	Alexander Jan, Trevor Taylor, Matthew Dillon, Bridget Jackson
Operational property efficiencies	06/05/2014	QMK	Andrew Ballsdon, Gavin Street, Rubina Greenwood, Sarah Ross	Alexander Jan, Bridget Jackson, Neil Keogh
Signalling efficiencies	08/05/2014	QMK	Andrew Ballsdon, Rob Ireland, James Drury, Gavin Street, Philip Duffield	Alexander Jan, Bridget Jackson, Neil Keogh
Telecoms efficiencies	08/05/2014	QMK	Andrew Ballsdon, Don Mandoc, Bill Cumberstone, Don Kite, John Gardner, Ashley Shelbrooke	Alexander Jan, Bridget Jackson, Neil Keogh
Maintenance and operations	09/05/2014	QMK	Iain Flynn, Michael Gurtenne, Rebecca Williams, Gary Walsh	Alexander Jan, Bridget Jackson, Neil Keogh
Electrification efficiencies	09/05/2014	QMK	Andrew Ballsdon, Matt Skinner, Paul Seller, Sarah Ross, Phil Collins	Alexander Jan, Bridget Jackson, Neil Keogh
Track efficiencies	09/05/2014	QMK	Andrew Ballsdon, Neil Cook, Paul Sullivan, James Dean, Emma Roby, Philip Duffield, Julian Williams, Gavin Street, Steve Featherstone	Alexander Jan, Bridget Jackson, Neil Keogh
Round up	14/05/2014	Arup	Andrew Ballsdon	Alexander Jan, Matthew Dillon, Bridget Jackson, Neil Keogh

Subject	Date	Location	Present: Network Rail /Other	Present: Arup
Discussion with PWC, auditors of the statutory accounts	15/05/2014	Teleconference	Jonathan Hook, Tony Nicol, Mark Roberts	Alexander Jan, Matthew Dillon, Bridget Jackson
Update meeting with ORR	15/05/2014	ORR offices	Mark Morris - ORR, Amanda Clark - ORR	Alexander Jan, Matthew Dillon, Bridget Jackson
Update meeting with ORR	18/06/2014	ORR offices	Mark Morris - ORR, Amanda Clark – ORR, Gordon Cole - ORR	Alexander Jan, Bridget Jackson

Appendix E: Documents received from Network Rail

Ref	Title	Description	File name	Date received
REEM efficiency reporting; process assurance documents				
EFF-1	Efficiency Handbook	Network Rail document setting out the CP4 definition of efficiency and how it is calculated and reported	NR Efficiency Handbook v3.pdf	14 March 2014
EFF-2	2013/14 Efficiency reporting Internal meeting dates	Dates and scope of interim internal review meetings held by Network Rail during 2013/14	Efficiency meetings.pdf	25-Jun-14
EFF-3	Draft efficiency statements	Draft statements for 8, 9, 12,13, 14 and 15	Arup Stats FY1314.xls	16 May 2014
EFF-4	Final REEM numbers	Final numbers for statement 12, with breakdown by expenditure type (opex, maintenance and renewals) and by area (England and Wales, and Scotland)	Consolidated tempalte for Arup using P13 data v16may.zip	25 June 2014
EFF-5	Updated efficiency statements	Updated statements for 8, 9, 12,13, 14 and 15	Arup Stats FY1314.xls	11 July 2014
EFF-6	Updated Final REEM numbers	Updated final numbers for statement 12, with breakdown by expenditure type (opex, maintenance and renewals) and by area (England and Wales, and Scotland) with slightly amended track S&C volumes	Consolidated tempalte for Arup using P13 data v11July.zip	11 July 2014
Maintenance efficiency (REEM)				
MTCE-1	Maintenance Efficiency and Sustainability Report	Details of measurement, PMAs and ASI information	Maintenance Efficiency and Sustainability Report.pdf	07 May 2014

Ref	Title	Description	File name	Date received
MTCE-2	REEM figures for 13/14	Broken down by cost category: labour, plant and vehicles, materials and other	Appendix 3 Account breakdown FY14. pdf	07 May 2014
MTCE-3	Supporting information for maintenance efficiency PMAs	Breakdown of efficiencies by cost category and/or route	Maintenance PMAs.pdf	07 May 2014
MTCE-4	Supporting information for Aspro efficiency	Breakdown by route and project	OCS RAM PMA Summary FY14.pdf	07 May 2014
MTCE-5	Supporting information for OC&S and RAM efficiency	Breakdown by route and project	RAM efficiencies.pdf	07 May 2014
MTCE-6	Weekly monitoring report covering overtime, recoveries, labour only subcontractors for Cardiff	Example to show how overtime is monitored	Cardiff Dashbord Wk 49.xls	01 July 2014
MTCE-7	Analysis of enhanced pay for LNW route for Period 1 2014/15, broken by budget holders (North, West Midlands, WC South, Works and HQ)	Example report to show how overtime cost and hours are monitored (NB is from 2014/15)	Copy of Overtime Analysis LNW P1.xls	01 July 2014
MTCE-8	List of 15 efficiencies achieved by the East Midlands route in 2012/13 totalling £2.986 million, some of which do not seem to be recurring (eg recovery from litter picking activity which was unbilled in previous years)	Examples of efficiencies achieved from East Midlands local management actions (NB relates to 2012/13 efficiencies)	Re: PMA Local Initiatives.msg	01 July 2014
MTCE-9	Two examples from Kent route of efficiences achieved totalling	Examples of efficiencies achieved from local management actions (NB relates to 2012/13	Re: REMINDER: PMA Local Initiatives.msg	01 July 2014

Ref	Title	Description	File name	Date received
	£0.203 million in 2012/13, one of which was expected to achieve more in 2013/14	efficiencies)		
MTCE-10	Three examples from LNE route of efficiencies achieved in FY 2012/13 totalling £3.589 million of which £1.8 million was a one off event (stock tidy up), remaining initiatives ifefficiency gain in 13/14 carried on at same level expected to generate around £4 million savings.	Examples of efficiencies achieved from local management actions (NB relates to 2012/13 efficiencies)	Re: PMA Local Initiatives.msg	01 July 2014
MTCE-11	Spreadsheet showing 44 initiatives forecast to achieve £2.293 million efficiencies in Wessex area in 2012/13 with actual efficiency of £1.735 million achieved	Examples of efficiencies achieved from local management actions (NB relates to 2012/13 efficiencies)	Wessex.msg	01 July 2014
MTCE-12	Control Period 4 performance assessment April 2014	Analysis of the contributing factors leading to performance measures - PPM and CASL - not being met for CP4. Key factors are extreme weather events, increased traffic, resource issues from operators and infrastructure faillure rates being worse than forecast	CP4 performance review v 1 0 FINAL (3).pdf	07 July 2014
MTCE-13	Works Delivery Function Efficiency	Headcount data and reconciliation to show the growth in numbers of staff in works delivery maintenance organisation and capex works team	Works Delivery Function Efficiency.msg attaching Phase 2 BC Summary All_version 1 g.xls	21 July 2014

Ref	Title	Description	File name	Date received
		to support maintenance efficency of £89 million.		
Maintenance costs and MUCs				
MUC-1	Maintenance Unit Cost Manual, April 2014	Manual explaining roles and responsibility for the MUC framework, and how unit costs are recorded and reported	MuC Manual 31032014 (2).pdf	07 May 2014
MUC-2	Maintenance FRM702: Reporting of Maintenance Unit Costs	Financial procedure setting out the framework and breakdown of key activity types to be used for the identification and reporting of maintenance volumes and associated costs for routes and delivery units	FRM702 Version 14 V3.pdf	07 May 2014
MUC-3	Labour rates at DU level sub-folder	E-mail and guidance setting out the methodology for calculating labour rates at a delivery unit rather than national level in 2013/14	Examples of Improvements.zip	07 May 2014
MUC-4	Reports and dashboards sub-folder	Two e-mails from central finance to routes setting out exception reports available to them to verify MUC and productivity data quality	Examples of Improvements.zip	07 May 2014
MUC-5	W1 close sub-folder	E-mail trail showing consultation, decision and implementation of the removal of the week 3 report	Examples of Improvements.zip	07 May 2014
MUC-6	Ellipse Miantenance Tasks Data Quality Report (YTD 2013-14) Final.xls FY14 MUC Bubble Analysis period 13 Y-T-D.xls FY 14 MUC Data Quality Meterics	Examples of exception reports used by Network Rail to identify potential errors, comprising: Maintenance volume variance reports for the year to date at period 13 showing the variance between actual and business plan at a route level, and between actual and baseline (derived from 2011	Sample reports.zip	07 May 2014

Ref	Title	Description	File name	Date received
	Period 13 Y-T-D.xls Maintenance Unit Cost and volume efficiencies P13.xls Maintenance Volume Variance Report YTD P13 Actual vs Baseline - Route & DU.pdf Maintenance Volume Variance Report YTD P13 Actual vs Business Plan - Route & DU.pdf	volumes) Unit cost and volume efficiencies spreadsheet against baseline, by route MUC data quality metrics scoreboard comparing performance at a delivery unit level against 8 metrics Work order error KPIs - where volume and order data does not tally, by delivery unit		
MUC-7	National Cost Efficiency Measaure Statement 14	The cost efficiency measure - reported internally by Network Rail - for the 30 reported MNT codes, showing unit cost, volume and total cost for Great Britain and disaggregated for England and Wales and Scotland	National CEM & Satement 14 Final Submission 7.5.2014 (no links).xls	07 May 2014
MUC-8	MUC Labour Rates Business Objects Submission Form No Links.xls	Spreadsheet showing the types of labour rate by delivery unit and cost centre Also includes versions of the e-mails explaining the sample reports available in MUC 4 in word format.	MUC Labour Rates Business Objects Submission Form No Links.zip	07 May 2014
MUC-9	Unit 4 Infrastructure Maintenance Unit Costs.xls (13 spreadsheets)	Spreadsheet for each period in 2013/14 showing YTD cost, unit, hours, labour, materials, contractor labour, specialist contractor, plant, haulage and unit cost for individual MNT codes, split by delivery unit and route	Unit Cost 4 Sent to Arup 9 5 2014.zip	09 May 2014

Ref	Title	Description	File name	Date received
MUC-10	Additional request on MUCs	Reconciliation showing how lost productivity and HQ overheads were apportioned to MNT 004, Plain Line Tamping, in Scotland as an example to demonstrate how all overheads are apportioned across MNT codes	RE: Final efficiency Review with Arup - Additional request on MUCs.msg	17 July 2014
Operations cost efficiency (REEM)				
OPEX-1	Network strategy and planning group PMAs	Details of non-volume PMAs	PMA Proforma Group Strategy 2013 14 April 2014.xlsx	29 April 2014
OPEX-2	Human Resourcesgroup PMAs	Details of non-volume PMAs	PMA Proforma HR 2013 14 .xlsx	29 April 2014
OPEX-3	Safety and sustainable development group PMAs	Details of non-volume PMAs	PMA Proforma safety 2013 14.xlsx	29 April 2014
OPEX-4	Finance group PMAs	Details of non-volume PMAs	PMA Proforma Finance 2013 14 April 2014.xlsx	29 April 2014
OPEX-5	Government & Corporate affairs group PMAs	Details of non-volume PMAs with 12/13 data also included	PMA Proforma GCA 13 14.zlsx	29 April 2014
OPEX-6	Information Management Opex Efficiencies at 2013/14 (CP4 to date)	Details of £17.4 million efficiencies achieved through headcount reduction, centralised infrastructure delivery programme and vitualisation, renegotiating third party support and licenses, and consumable savings initiatives. Savings are those achieved for whole of CP4 not just 13/14.	01 PMA IM Opex Efficiencies CP4 to date @ 13-14.doc	30 June 2014
OPEX-7	Reconciliation between 2012/13 and 2013/14 for opex costs (support and O&CS)	Explains key movements to baseline and actuals in terms of inflation, HLOS adjustments, reclassification between cost categories and one off items. £14 million underspend categorised as	High level y-on-y support rec.xls	09 July 2014

Ref	Title	Description	File name	Date received
		other.		
Track renewals (REEM)				
TRACK-1	CP4 track sustainability and forecasts for CP5 to CP11	14 slides setting out volume delivery, condition and failure information for CP4, and projections for CP5 to CP11	Track sustainability slides End year JW.pdf	29 April 2014
TRACK-2	Final efficiency report for track renewals	28 page report explaining volume and unit rates forecast, variance and budget for plain line and S&C, and sustainability update	REEM Track final.pdf	29 April 2014
TRACK-3	REEM figures in 13/14 prices for Plain line and S&C track	Figures for whole CP, disaggregated to show England & Wales and Scotland, with supporting spreadsheets	vol YE track.xls	29 April 2014
TRACK-4	Plain line and S&C PMAs	Provides cost information by PMA	Final Track PMA.xls	29 April 2014
TRACK-5	REEM figures in 13/14 prices	Figures for whole CP, disaggregated to show England & Wales and Scotland for track work without an associated volume	Nonvol YE track.xls	29 April 2014
TRACK-6	Period 13 year to date volume movement vs budget by route and by reason	Powerpoint slides showing 2013/14 budget to actual volume difference by route and by cause of under-delivery	2013_14 volume loss IP Track.pdf	09 May 2014
TRACK-7	Infrastructure Condition Report, Period 13 013-14	Breakdown of asset stewardship indicator by asset and route, for 2012/13 and 2013/14 providing analysis of the location and nature of rail defects	26263_ICR_Pd13_2013_14.pdf	30 June 2014
TRACK-8	Final Efficiency report (REEM), Track Renewals 2013/14	Updated version of report (see TRACK-2) with corrected S&C unit cost efficiency analysis	REEM Track final.pdf	21 July 2014
TRACK-9	CP4 renewals volumes track	Shows Plain line under-delivery of 621 units (6.6%) against the CP4 baseline set out in DP10 and S&C	ORR Table - end CP4 (Track).xls	21 July 2014

Ref	Title	Description	File name	Date received
		over-delivery of 19 units (1.0%). Refers to mitigating actions required for deferrals - individual job losses have resulted in localised asset condition issues which will be recovered by displacing lower priority renewals work in CP5 rather than adding volume; in the meantime additional maintenance will be required.		
Buildings (operational property) renewals (REEM)				
BLDG-1	Buildings measures	4-slide presentation describing asset stewardship indicators for stations and light maintenance depots by region	Buildings measures.pdf	01 May 2014
BLDG-2	REEM figures in 13/14 prices for OppsProp	Figures for whole CP, disaggregated to show England & Wales and Scotland	Nonvol 1314 YE opsprop v3.xls	01 May 2014
BLDG-3	REEM figures in 13/14 prices for OppsProp	Details of operational property PMAs	PMA Proformav2_BC_P13 1314.xls	01 May 2014
BLDG-4	Formal Submission for Approval in Detail to the ORR - Birmingham New Street Gateway Projects	Submission for additional scope of enhancement works and efficient renewals overspeand	BNS additional funding Detail ORR Submission 07 10 13.pdf	06 May 2014
BLDG-5	Birmingham Gateway Project - Extra Enhancement Costs, RAB addition approval	Letter from ORR to Network Rail dated 13/12/13 to confirm extra enhancement works for CP5	BNS RAB addition for enhancement 13Dec13 ORR ref 3744_001.pdf	06 May 2014
BLDG-6	Birmingham Gateway Project - Extra Renewal Costs, regulatory treatment	Letter from ORR to Network Rail dated 13/12/13 to approving regulatory treatment of renewals works in CP4	BNS extra renewals 13Dec13 ORR ref 3747_001.pdf	06 May 2014

Ref	Title	Description	File name	Date received
BLDG-7	Supporting information for deferral of work at Paddington, comprising COWD and change control	Breakdown of cost of work done on Paddington roof renewal	Paddington Rollover Final ARUP.xls	08 May 2014
BLDG-8	Explanation of how the operations property component of the ASI is calculated	Explanation of Station Condition measure (and how it differs from SSM - larger stations have greater weighting than smaller) and Light Maintenance Depot Condition measure	Ops Property in the ASI.pdf	09 May 2014
BLDG-9	Network Rail Asset Reporting Manual - Procedures for the Reporting of Station Stewardship measure	41 page manual from October 2010 outlining inspection process, responsibilities and asset weightings	SSM Calculation.pdf	09 May 2014
BLDG-10	SSM calculation outline	1 page explaining how asset condition ratings are transflated into a Station SSM score	M17PR Station Stewardship Measur _2_ _2_.pdf	09 May 2014
Civils renewals (REEM)				
Area not included in 13/14 efficiency calculations, as per previous years				
Electrification and power renewals (REEM)				
E&P-1	Electrification and Plant Assets Groups, annual efficiency report	27 page report explaining financial and volume delivery variances, PMAs and robustness/sustainability measures	Energy Services - EP Annual Efficient Report 2104_V1.2_Pub.pdf	29 April 2014
E&P-2	Route rollover projects	Financial amounts rolled over to CP5 by route and project	Nonvol 1314 YE electrification V7 rollover.pdf	29 April 2014
E&P-3	Electrification Renewals Positive Management Actions	Outline of portfolio-wide and project specific interventions resulting in savings on the electrification reneals programme, with an estimation of their financial impact.	Management Interventions Electrification Renewals 2013-14.doc	01 July 2014

Ref	Title	Description	File name	Date received
Signalling renewals (REEM)				
SIG-1	CP4 annual analysis and forecasts for CP5 to CP11	10 slides setting out volume delivery, condition and failure information for CP4, and projections for CP5 to CP11	Signalling Sustainability Slides April 2014 v3.pdf	29 April 2014
SIG-2	REEM figures in 13/14 prices for Signalling	Figures for whole CP, disaggregated to show England & Wales and Scotland, plus supporting spreadsheets on non-volume, SEU and roll-up analysis	Arup PMA Submission.xls	29 April 2014
SIG-3	Explanation for CP4 volume increase	One slide with bullets	Explanation for increase in volumes.pdf	29 April 2014
SIG-4	Reliability Improvement Alert, 650V Signalling Power Supply Fuses	Example of investigation into a significant root cause of signalling failures with details of additional maintenance activities required to reduce the failure rate. Without quantification we were unable to confirm how significant a root cause of train delays this example was.	RIA 046 Issue 2A - 650 V Signalling Power Supply Fuses. Pdf	21 July 2014
SIG-5	CP4 Signalling volumes	Shows variances in volume delivery for Conventional SEUs, ERTMS, Crossrail and Level Crossings with an explanation of slippage risks and condition data for interlockings and for level crossings.	CP4 Signalling Volumes v2. ppt	21 July 2014
SIG-6	Position Paper, CP5 Development Funding, Signalling Renewals, 6th July 2012 Investment Panel	Request for accelerated spending from CP5 signalling renewals portfolio to delivery opex savings early in CP5 as part of the National Operating Strategy. Project by project detail was not provided so we could not verify the deferral of	CP5 advanced funding position paper.xls	21 July 2014

Ref	Title	Description	File name	Date received
		lower priortiy works into CP5 under NOS		
Telecoms renewals & FTN (REEM)				
TEL-1	REEM figures in 13/14 prices for telecoms	Figures for whole CP, disaggregated to show England & Wales and Scotland	Nonvol YE14 telecomsv2.xls	01 May 2014
TEL-2	Sustainability (telecoms)	3-page PDF document with summary of five elements on sunject of sustainability: 1. Positive Management Actions 2. Telecoms Renewals Expenditure in CP4, CP5 and CP6 3. Asset Condition 4. CP4 Volumes 5. Rollover 6. Telecoms Delay Minutes	001 Sustainability _3_.pdf	01 May 2014
TEL-3	REEM figures in 13/14 prices for FTN	Figures for whole CP, disaggregated to show England & Wales and Scotland	Nonvol year end FTN.xls	07 May 2014
TEL-4	Telecoms train delay minutes	Spreadsheet showing telecoms train delay minutes for each period in 2013/14 by route and by GSM-R/Non GSM-R faults	1 Telecoms Train Delay detail master 280414.xls	30 June 2014
TEL-5	Methodology for efficiencies and efficiency scorecard	Powerpoint slides showing how telecoms effencies are identified, which are from efficiency scorecards and actual project cost, with an example of a scorecard	Tlecoms Capex Efficiencies FY14(Arup).ppt	30 June 2014
TEL-6	Asset Condition Assessment for Telecommunications Equipment	Methodology for assessing telecoms asset conditions, dated April 2007	NR_SP_TEL_30133.pdf	30 June 2014
TEL-7	Telecom Infrastructure Decision	Methodology used to make telecoms asset	NR_LT_TEL_30150.pdf	30 June 2014

Ref	Title	Description	File name	Date received
	Support Tool Handbook	renewals decisions for non-consumable itemas, dated March 2011		
TEL-8	Analysis of Telecoms PMAs and supporting efficiency scorecards	Efficiency scorecards for projects with telecoms efficiencies greater than £200k, showing the component efficiencies and their values, with a summary sheet showing all PMAs	2 PMAs and Efficiency Scorecards	30 June 2014
TEL-9	Master Tables, GSM-R delay, national data	Underlying reasons for GSM-R related delay incidents and minutes by period for 2013/14 for Great Britain	ARUP GSMR Rolling Analysis master.xls	04 July 2014
TEL-10	Telecoms service affecting failures	Breakdown of telecoms related delay incidents (all), incidents causing over 10 minutes delay and delay minutes by cause (including GSM-R) for all periods in 2013/14. Data is for Great Britain and by route.	Telecoms ARUP Service affecting failures 2013_14.xls	04 July 2014
IT, P&M, & Other renewals (REEM)				
IT-1	Information Management Efficiencies 2013/14	Breakdown of £11.8 million efficiency into hardware efficiencies of £0.8m, software efficiencies of £5.4m and system integrator efficiencies of £5.6m	PM IT CAPEX CP4.doc	30 June 2014
P&M-1	REEM figures in 13/14 prices for Signalling Power and Communications (SP&C) Plant and Machinery	Figures for whole CP, disaggregated to show England & Wales and Scotland	Nonvol 1314 YE PM SPC v 6 pdf	29 April 2014
P&M-2	Electrification and Plant Assets Groups, annual efficiency report	27 page report explaining financial and volume delivery variances, PMAs and robustness/sustainability measures, with some	Energy Services - EP Annual Efficient Report 2104_V1.2_Pub.pdf	29 April 2014

Ref	Title	Description	File name	Date received
		detail on Plant and Machinery		
P&M-3	REEM figures in 13/14 prices for Depot Plant	Figures for whole CP, disaggregated to show England & Wales and Scotland	Nonvol 1314 YE P&M depots v3.xls	01 May 2014
P&M-4	Confirmation that P&M data received is complete	Explanation that other movements in P&M category cannot be explained as the baseline was artificially split at the start of CP4	Efficiency item 44.msg	30 June 2014
Other Regulatory Accounts statements				
Other-1	Draft Annual Return - Section 1 - Operational performance and stakeholder relationships	Delay statistics and commentary by route, area and asset for 2013/14 and comparison over the whole control period.	2014 06 25 Annual Return 2014_Section 1_draft JT2 (2).pdf	25 June 2014
Other-2	Draft Regulatory Financial Statements	Network Rail's draft Regulatory Financial statements for the financial year 2013/14	RFS FY1314 27 Jun.zip	30 June 2014
Other-3	Draft annual return - complete	Outlines Network Rails achievements and challenges during 2013/14 which provides context for the numbers reported in the regulatory statements.	Annual Return 2014_01.07.2014.pdf	03 July 2014
Other-4	Updated draft regulatory financial statements	Updated draft regulatory financial statements for 2013/14	RFS FY1314 11 Jul.doc	11 July 2014

Appendix F: Unit cost confidence grading methodology

Our review of unit costs presented in Statements 14 and 15 of the Regulatory Accounts has included a confidence grading analysis. This is an assessment of data reliability and accuracy using an alpha-numeric scoring system that is based on the definitions set out below.

System reliability grading system **System Reliability Band**	**Description**
A	Appropriate, auditable, properly documented, well-defined and written records, reporting arrangements, procedures, investigations and analysis shall be maintained, and consistently applied across Network Rail. Where appropriate, the systems used to collect and analyse the data will be automated. The system is regularly reviewed and updated by Network Rail's senior management so that it remains fit for purpose. This includes identifying potential risks that could materially affect the reliability of the system or the accuracy of the data and identifying ways that these risks can be mitigated. The system that is used is recognised as representing best practice and is an effective method of data collation and analysis. If necessary, it also uses appropriate algorithms. The system is resourced by appropriate numbers of effective people who have been appropriately trained. Appropriate contingency plans will also be in place to ensure that if the system fails there is an alternative way of sourcing and processing data to produce appropriate outputs. Appropriate internal verification of the data and the data processing system is carried out and appropriate control systems and governance arrangements are in place. The outputs and any analysis produced by the system are subject to management analysis and challenge. This includes being able to adequately explain variances between expected and actual results, time-series data, targets etc. There may be some negligible shortcomings in the system that would only have a negligible effect on the reliability of the system.
B	As A, but with minor shortcomings in the system. The minor shortcomings would only have a minor effect on the

	reliability of the system.
C	As A, but with some significant shortcomings in the system. The significant shortcomings would have a significant effect on the reliability of the system.
D	As A, but with some highly significant shortcomings in the system. The highly significant shortcomings would have a highly significant effect on the reliability of the system.
X	Data reliability cannot be measured

Notes:

1. System reliability is a measure of the overall reliability, quality, robustness and integrity of the system that produces the data.

2. Some examples of the potential shortcomings include old assessments, missing documentation, insufficient internal verification and undocumented reliance on third-party data.

Accuracy grading system

Accuracy Band	**Description**
1*	Data used to calculate the measure is accurate to within 0.1%
1	Data used to calculate the measure is accurate to within 1%
2	Data used to calculate the measure is accurate to within 5%
3	Data used to calculate the measure is accurate to within 10%
4	Data used to calculate the measure is accurate to within 25%
5	Data used to calculate the measure is accurate to within 50%
6	Data used to calculate the measure is inaccurate by more than 50%
X	Data accuracy cannot be measured

Notes:

1. Accuracy is a measure of the closeness of the data used in the system to the true values.

2. Accuracy is defined at the 95% confidence level - i.e. the true value of 95% of the data points will be in the accuracy bands defined above.

Appendix G: Opinion letter

Our ref SJS/NRIL/DO/v1.0

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The Board of Directors
Network Rail Infrastructure Limited
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90 York Way
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N1 9AG

For the attention of Patrick Butcher, Group Finance Director

27 August 2014

Dear Sirs,

Network Rail Infrastructure Limited, regulatory accounts statements 2012/13: Independent Reporter's Report to the Company and the Office of Rail Regulation (ORR) – Reporter's draft opinion

Introduction

In accordance with the terms of engagement for the Independent Reporter, we have reviewed the sections of the regulatory financial statements of Network Rail Infrastructure Limited (the Company) for the year ended 31 March 2014, which comprise:

Statement 8b – Analysis of maintenance expenditure by Maintenance Delivery Unit (MDU);
Statement 9b – Detailed analysis of renewals expenditure;
Statement 12 – Analysis of efficiency (Real Economic Efficiency Measure);
Statement 13 – Volume incentives;
Statement 14 – Maintenance unit costs; and
Statement 15 – Renewals unit costs and coverage.

Respective responsibilities of directors and reporters

As described in the statement of directors' responsibilities, the Company's directors are responsible for the preparation of the regulatory financial statements in accordance with Condition 11 of the Network Licence. As stated in Clause 2.26 of the Regulatory Accounting Guidelines (RAGs) dated March 2014, the Regulator may use a reporter to validate some of the information provided by

Network Rail in the regulatory accounts. This complements the work of the auditors.

Work completed – basis of opinion

We have conducted our review on a test basis, focusing upon evidence relevant to the amounts and disclosures in the statements listed in our terms of reference. Our review has comprised sample testing of the regulatory financial statements to underlying supporting information and reconciliation to other parts of the financial statements where appropriate.

We have performed where possible, compliance tests to confirm the adequacy of accounting controls and procedures and detailed substantive testing to confirm the accuracy of accounting entries with reference to original underlying data records.

We have also reviewed the extent to which Network Rail is able to demonstrate that its maintenance and renewals activities are robust and sustainable.

Opinion

Based on our review and audit of information and evidence provided in respect of the statements within the Regulatory Accounts, we confirm that in our opinion the statements that we have reviewed (listed in the introduction above) have been prepared in accordance with the Regulatory Accounting Guidelines and are consistent with the underlying financial statements.

However, we consider there to be uncertainty with respect to efficiencies being reported in relation to a number of asset renewal and maintenance areas.

For plant and machinery renewals, we have not received sufficient evidence to demonstrate how the reported efficiencies have been realized. The total claimed efficiencies in respect of plant and machinery expenditure for 2013/14 amount to approximately £65m.

For certain categories of maintenance activity associated with track assets, we have not received sufficient evidence to demonstrate satisfactorily that there is no linkage between expenditure levels feeding into Network Rail's efficiency calculation and the non-delivery of regulated CP4 outputs during 2013/14 (passenger train service performance, measured using the "PPM" metric as well as "freight delay per 100 kilometres").

There are £35m of efficiency savings across the categories of maintenance expenditure in question. Further evidence and analysis would be required in order for us to assess adequately what proportion, if any, of this expenditure relates to non-performance and hence should not be claimed as efficiency.

For certain categories of maintenance activity associated with electrification assets we have not received sufficient evidence to demonstrate satisfactorily that there is no linkage between expenditure levels feeding into Network Rail's efficiency

calculation and the shortfall in the target reliability measure "power incidents causing delays greater than 300 minutes" during 2013/14.

Network Rail is reporting a total inefficiency amounting to approximately £69m across the relevant categories of maintenance expenditure. Further evidence and analysis would be required in order for us to assess adequately the extent to which this may understate the recorded level of inefficiency.

Stefan Sanders
Named Independent Part A Reporter
Ove Arup & Partners Ltd

27 August 2014