

**Independent Reporter A**  
Annual Return Audit 2009  
Final Report

**Halcrow Group Limited**

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# Independent Reporter A

## Annual Return Audit 2009

### Final Report

#### Contents Amendment Record

This report has been issued and amended as follows:

<b>Issue</b>	<b>Revision</b>	<b>Description</b>	<b>Date</b>	<b>Initial</b>
1	0	Interim report	01/07/09	VM/DS
1	0	Final report	10/08/09	VM/DS
1	1	Final report	28/08/09	VM/DS
1	2	Final report	08/01/10	VM/DS

# 1 Executive summary

## 1.1 Reporter's scrutiny and opinion

### Commentary on Annual Return 2009

- 1.1.1 This is Halcrow's final year as Independent Reporter for the Audit of Network Rail's Annual Return. I can report that, by and large, we experienced satisfactory co-operation at all levels within Network Rail which has allowed our audit report to be delivered to schedule. Confirmatory and/or supporting data from Network Rail, requested by our audit teams as an essential element of our audit work, has been made available to us. Unfortunately, in a number of cases it has been received very late in our reporting timescale agreed with Network Rail and ORR, and evidently unchecked for accuracy by Network Rail on issue. This represents a marked deterioration in the timeliness and quality of data provision by Network Rail from what has, for some seven years now, been a largely non-contentious and timely process. It is not for the Independent Reporter, however, to speculate on the reasons behind this deterioration.
- 1.1.2 We believe that Network Rail's Annual Return should be regarded as a consolidated report on their delivery of regulatory measures and specific targets. Taken in this context the Annual Return satisfies that objective. The suite of measures and targets, as presently defined, forms a partial view of Network Rail's activities, but does not provide a detailed view on every aspect of Network Rail's performance and stewardship, particularly where measures are not aligned with Network Rail's management information or priorities. A detailed review, analysis and comment on each of the individual measures which we have audited can be found within the main body of our report.
- 1.1.3 The figures contained in the Annual Return 2009 indicate that Network Rail has achieved the required regulatory targets with the exception of the following Measures:
- (a) Earthworks Failures (Measure M6);
  - (b) Electrification condition – d.c. traction contact system (Measure M16);
  - (c) Renewals Efficiency: Unit Costs; and
  - (d) Renewals Efficiency: Budget Variance
- 1.1.4 This year's exceptions are identical to last year's and our auditors' commentary outlining the circumstances leading to these exceptions is provided in the relevant sections of our audit report.
- 1.1.5 As in previous years, in assessing whether or not Network Rail has achieved the targets set, we have not taken into consideration tolerance levels, nor have we taken into account the confidence grades which have been self-assigned by Network Rail to the measures.

### Data Quality Issues

- 1.1.6 We have found little general improvement this year in the quality and accuracy of the data provided by Network Rail for the purposes of our audits or presented in their Annual Return. Unfortunately, as referred to above, some areas of notable deterioration in Network Rail's data quality and accuracy have arisen.

- 1.1.7 It is the Independent Reporter's considered view that, in relation to the confidence grading achieved by Network Rail for its reported data, a Reliability Grade of anything other than A or B is inadequate and is reflective of deficient data management or reporting processes, and an Accuracy Grade of anything other than 1 or 2 is inadequate and is reflective of inadequate rigour in data collection and validation. Examination of our Confidence Grade summary table (Appendix F) demonstrates that Network Rail still has some way to go to achieve what is a not unreasonable objective.
- 1.1.8 We have made a number of recommendations to address these process and data quality deficiencies and our successors as Independent Reporter will no doubt be subsequently following these up with Network Rail on behalf of ORR. In five instances we have sufficient concerns to have downgraded the confidence level of the reported measure from that in our 2008 Audit Report:
- (a) Electrification condition – a.c. traction feeder stations & track sectioning points (Measure M13);
  - (b) Electrification condition – d.c. substations (Measure M14);
  - (c) Electrification condition – a.c. traction contact system (Measure M15);
  - (d) Station Condition Index (Measure M17); and
  - (e) Signalling Renewed (Measure M24)

#### **Nature of Regulatory & Other Targets**

- 1.1.9 As Independent Reporter for Audit of Network Rail's Annual Return we have no specific remit from ORR to examine Network Rail's asset management practices as such; the purpose of this report being to independently validate the data collected and analysed by Network Rail's for their Annual Return to demonstrate compliance (or otherwise) with their relevant regulatory and other stakeholder-agreed targets.
- 1.1.10 In undertaking our audit programme it is evident that there is an investment by Network Rail in staff resource and time in the collection, collation and analysis of asset condition and asset performance data specifically for ORR monitoring and Annual Return purposes. What still has not been made clear to us is the extent to which that data is of practical value to the relevant Network Rail managers in their day-to-day management of the infrastructure assets concerned, or whether parallel data collection and analysis work-streams have had to be established to that end.
- 1.1.11 It is our firm belief that the adoption of a more systematic approach by Network Rail to go beyond the simple collection, collation and analysis of asset condition and asset performance data, to extend to positively ensuring compliance with (or bettering) the agreed regulatory and specific targets as set; would have the benefit of improving Network Rail's performance and asset stewardship overall. On that basis alone a more thorough approach on their part would be worthwhile. Failing that, we believe that it would be necessary for ORR to introduce a more rigorous regime of monitoring compliance with these measures throughout the year, requiring corrective action plans from Network Rail from time to time where compliance is patently not being achieved.

#### **Reporter's Audit Statement**

- 1.1.12 This report, including opinions, has been prepared for use of Office of Rail Regulation and Network Rail and for no other purpose. We do not, in reporting, accept responsibility for any other purpose or to any other person to whom this report is shown. We report our opinion as to whether Network Rail's Annual Return 2009 gives a representative view and whether the data reported by Network Rail is consistent with evidence provided to us at audit.
- 1.1.13 We confirm that Network Rail has prepared the Annual Return for 2009 in accordance with its regulatory and statutory obligations using procedures prepared by Network Rail and agreed with Office of Rail Regulation.

- 1.1.14 We confirm that Network Rail's Annual Return 2009 was submitted in accordance within the timescale required by Condition 15 of Network Rail's Network Licence.
- 1.1.15 We confirm we have completed audits of the data contained in Network Rail's Annual Return 2009 relating to the measures contained in the "Form of the 2009 Annual Return" prepared by Network Rail and agreed with the Office of Rail Regulation in accordance with the requirements of Paragraph 8 of Condition 15 of the Network Licence. The only exceptions are where we have identified in the text of our report matters which require further clarification. We conducted our audit in accordance with an audit plan. Our audit included examination, on a sample basis, of evidence relevant to the data and disclosures in the Annual Return 2009. We planned and performed our audit so as to obtain information and explanations which we considered necessary in order to provide us with sufficient evidence to give reasonable assurance on the validity of data in the Annual Return 2009.
- 1.1.16 We confirm that, in our opinion, the reported information is an acceptable representation of performance, and that data has been sufficiently well prepared and reported in accordance with agreed procedures, except as specifically identified in our audit report commentaries.

David Simmons,  
Independent Reporter,  
Halcrow Group Limited,  
August 2009

## 1.2 Overview of the Annual Return 2009

### Operational Performance

- 1.2.1 **Performance.** The Public Performance Measure (PPM) increased (improved) to 90.6%. The total delay minutes attributable to Network Rail reduced (improved) to 8.84 million minutes. Delay to franchised operators reduced to 1.59 minutes per 100 train km; targets exclude delay to non-franchised operators.
- 1.2.2 **Regulatory target.** The regulatory target for these measures has been met.
- 1.2.3 **Reliability grade.** The definition of these measures is documented. Network Rail has established procedures to report and analyse delay information. We believe that Operational Performance should have a reliability grade of A.
- 1.2.4 **Accuracy grade.** We believe that Operational Performance should have an accuracy grade of 1

### Customer & Supplier Satisfaction

- 1.2.5 **Performance.** The 2008/09 results show a downturn in the perceptions of respondents from Train Operating Companies and Freight Companies. The results indicate that Network Rail is continuing to make steady progress in its relationships with its supply chain.
- 1.2.6 **Regulatory target.** There is no regulatory target for this measure.
- 1.2.7 **Reliability grade.** We are satisfied that Network Rail has demonstrated to us a reliable process for conducting the customer and stakeholder surveys. We believe the satisfaction measure should have a reliability grade of A with the caveat that this is a qualitative measure and as such should be considered as only one of a range of KPIs for judging customer and stakeholder satisfaction.
- 1.2.8 **Accuracy grade.** We are satisfied that the weighting processes applied to the response rates are appropriate. We believe the accuracy grade should have a reliability grade of 1.

### Joint Performance Process

- 1.2.9 **Performance.** We are satisfied that adequate governance arrangements are in place, that Network Rail makes appropriate and adequate resources available for the good running of the Joint Performance Process, that an annual programme for updating the JPIPs and associated budgets is in place and clearly communicated and JPIPs produced in accordance with that programme.
- 1.2.10 **Regulatory target.** There is no regulatory target for this measure.
- 1.2.11 **Reliability grade.** We believe that the audited measure should have a reliability score of A.
- 1.2.12 **Accuracy grade.** JPIPs are in place for audited Routes, which satisfies the terms of the audit. We believe therefore that the accuracy grade for the JPIP measure as presented in the Annual Return is therefore 1.

### Linespeed capability (C1)

- 1.2.13 **Performance.** The net change in reported total kilometres of track compared with last year is an increase of 0.1%, this was due to data cleansing in GEOGIS which has been undertaken.
- 1.2.14 **Reliability grade.** The definition for this measure is clearly documented. A reasonably well documented process has been followed to collect and report this measure. We believe measure C1 should have a reliability grade of B.

- 1.2.15 **Accuracy grade.** There is marginal yearly variation in the reported total track kilometres, which is almost entirely due to data cleansing. However we note that the process for updating linespeed changes in GEOGIS is now consistently applied across the network by the Positioning systems and Traffic team. We believe C1 should have an accuracy grade of 2.

### Gauge capability (C2)

- 1.2.16 **Performance.** There is no reported net change in the total kilometres of route, compared with last year.
- 1.2.17 **Reliability grade.** The definition for this measure is clearly documented. A reasonably well documented process has been followed to collect and report this measure. We believe that measure C2 should have a reliability grade of B.
- 1.2.18 **Accuracy grade.** Our sampling found no errors in changes to gauge made in 2008/09, or to a sample of ELRs. We believe that measure C2 should have an accuracy grade of 2.

### Route availability value (C3)

- 1.2.19 **Performance.** Track in all 3 RA bands have changed during 2007/08. Track in RA1-6 has reduced by 10.8%; track in RA7-9 has increased by 2.1% and RA10 has reduced by 3.0%.
- 1.2.20 **Reliability grade.** The definition for this measure is clearly documented. A reasonably well documented process has been followed to collect and report this measure. We believe that measure C3 should have a reliability grade of B.
- 1.2.21 **Accuracy grade.** Our sampling found one error in the difference between what is reported in GEOGIS and what is reported in the capabilities database. We believe that measure C3 should have an accuracy grade of 2.

### Electrified track capability (C4)

- 1.2.22 **Performance.** The reported net change in total electrified track kilometres is a 0.2% increase; this variance has been caused by new sections of electrified track opened, closure of lines, and data cleansing.
- 1.2.23 **Reliability grade.** The definition for this measure is clearly documented. A reasonably well documented process has been followed to collect and report this measure. We believe that measure C4 should have a reliability grade of B.
- 1.2.24 **Accuracy grade.** We believe that C4 should have an accuracy grade of 2.

### Mileage

- 1.2.25 **Performance.** Passenger train miles have increased by 2.7%, whilst the freight miles decreased by 10.8%. Total train mileage has increased by 1.6% to 307.7 million.
- 1.2.26 **Passenger Train Miles Reliability grade.** The definition and procedure for this measure is not documented. A consistent process has been followed to collect and report this measure, using industry standard sources of data. We believe that Passenger Train Miles should have a reliability grade of B.
- 1.2.27 **Passenger Train Miles Accuracy grade.** We found uncertainties in the data arising from inclusion of Chiltern Railways services running on LUL infrastructure. Despite that, we believe that Passenger Train Miles should have an accuracy grade of 2.
- 1.2.28 **Freight Train Miles Reliability grade.** The definition and procedure for this measure is not documented. A consistent process has been followed to collect and report this measure, using industry standard sources of data. We believe that Freight Train Miles should have a reliability grade of B.
- 1.2.29 **Freight Train Miles Accuracy grade.** We believe that Freight Miles should have an accuracy grade of 2.

## Freight Gross Tonne Miles

- 1.2.30 **Performance.** Freight gross tonne miles (GTM) have decreased by 0.8% between 2007/08 and 2008/09.
- 1.2.31 **Reliability grade:** The definition and procedure for this measure is not documented. A consistent process has been followed to collect and report this measure, using industry standard sources of data. We believe Freight Gross Train Miles should have a reliability grade of B.
- 1.2.32 **Accuracy grade:** We believe Freight Gross Train Miles should have an accuracy grade of 2.

## Management of Late Disruptive Possessions

- 1.2.33 **Performance.** The reported figures show that the overall number of Late Disruptive Possessions rose in 2008/09, following a downward trend on 2007/08.
- 1.2.34 **Reliability Grade.** We believe that the reported data for Management of Late Disruptive Possessions should have a reliability grade of B.
- 1.2.35 **Accuracy Grade.** We believe that the reported data for Management of Late Disruptive Possessions should have a reliability grade of 3.

## Number of broken rails (M1)

- 1.2.36 **Performance.** 164 broken rails were reported for 2008/09. This has continued the downward trend of this measure since 2000/01. The result for 2008/09 is a 9.4% improvement on 2007/08.
- 1.2.37 **Regulatory target.** The regulatory target for this measure has been met.
- 1.2.38 **Reliability grade.** The definition for this measure is clearly documented. A documented process has been followed to collect and report this measure. The process is closely managed and the figures internally reported on a daily, four weekly and annual basis. We believe that M1 should have a reliability grade of A.
- 1.2.39 **Accuracy grade.** Two parallel systems are used to identify broken rails for this measure and a reconciliation process is used to increase accuracy. The process would have to misreport four broken rails or more in 2008/09 to have an inaccuracy of 1% or higher; our assessment is that the accuracy of this process would not allow this level of misreporting. We believe that M1 should have an accuracy grade of 1.

## Rail defects (M2)

- 1.2.40 **Performance.** In 2008/09, the number of isolated defects discovered was 20,388, which are 10.78% fewer defects than found in 2007/08; the length of continuous rail defects found was 237,940 yards, a decrease of 30.0% yards of defects than found in 2007/08.
- 1.2.41 **Regulatory target.** There is no regulatory target for this measure.
- 1.2.42 **Reliability grade.** The definition for this measure is clearly documented. A documented process has been followed to collect and report data for this measure. However, data correction has been required at the start of each reporting year for the last five years, including for 2008/09. We believe that M2 should have a reliability grade of B.
- 1.2.43 **Accuracy grade.** We have concerns regarding the level of data correction required at the start of the 2008/09 reporting year. These concerns have persisted due to the delay of the new RDMS system which was introduced part way through the year and the partial transfer of data to the new system. Therefore, we believe that M2 should have an accuracy grade of 3.

## Track geometry (M3 & M5)

- 1.2.44 **Performance – National SDs.** The results for 2008/09 for all twelve national standard deviation (SD) parameters are at the highest level of track geometry since before 2000/01.

- 1.2.45 **Performance – PTG.** The trends for poor track geometry show a continuing improvement for 2008/09 across all Rotes.
- 1.2.46 **Performance – L2 exceedences.** 0.49 L2 exceedences per track mile were reported for 2008/09, a 16.6% improvement on 2007/08 and better than the target of 0.9.
- 1.2.47 **Regulatory target.** The regulatory targets for the twelve elements of the national standard deviation data and level 2 exceedences have been met. There are no regulatory targets for poor track geometry or speed band measures.
- 1.2.48 **Reliability grade.** The definition for this measure is clearly documented. The procedure is clearly defined and is well controlled. The collection and reporting of this measure is a closely managed process which has been in operation for a number of years. We believe that both M3 & M5 should have reliability grades of A.
- 1.2.49 **Accuracy grade.** The data shows considerable consistency between measurement runs; the calculations are subject to checking. We believe that both M3 & M5 should have accuracy grades of 1.

#### Condition of asset temporary speed restriction sites (M4)

- 1.2.50 **Performance.** In 2008/09 there were 478 condition of asset TSRs on the network reportable for this measure with a total of severity score of 2284 bettering the baseline target by 23% for the number of sites and by 18% for the severity score. The overall percentage improvement is lower over the previous year than it was in 2007/08.
- 1.2.51 **Regulatory target.** The regulatory targets for this measure have been met.
- 1.2.52 **Reliability grade.** The definition of the measure is clearly documented. The procedure is applicable and has been demonstrably followed; however, the procedure does not fully document the full extent of manual processing and checking undertaken, which put the reliability of the process at risk. We believe M4 should continue to have a reliability grade of B.
- 1.2.53 **Accuracy grade.** The PPS system provides a high degree of accuracy for the base data, as it is the source material for the Weekly Operating Notice (a key document for both engineering and operations staff which is subject to rigorous oversight). However, the accuracy of the process is affected by risks from the degree of manual review and manipulation of raw data to produce the result. We believe M4 should continue to have an accuracy grade of 2.

#### Earthworks Failures (M6)

- 1.2.54 **Performance.** There were 61 earthworks failures for 2008/09. This was a 43.0% decrease in failures compared to 2007/08; 29.8% over the regulatory target. Earthworks failures causing train derailment decreased from 0 in 2007/08 to 1 for the year ended 2008/09.
- 1.2.55 **Regulatory target.** The regulatory target for this measure has not been met.
- 1.2.56 **Reliability grade.** The definitions for these measures are clearly documented. A single documented process has been followed to collect and report on these measures. The process of correctly identifying the root cause of incidents attributed to earthwork failures is not a simple process and takes time to analyse correctly. However, this has been successfully achieved for the year end deadline. Therefore, we believe that M6 should have a reliability grade of A.
- 1.2.57 **Accuracy grade.** The process is not sufficiently robust to ensure that the number of reported incidents is within 1%. We believe that M6 should have an accuracy grade of 2.

#### Bridge condition (M8)

- 1.2.58 **Performance.** 4,107 bridges were entered into the tool for 2008/09. 76% of bridges are in the top two (out of five) condition grades, 98% are in the top three grades.
- 1.2.59 **Regulatory target.** There is no regulatory target for this measure.

- 1.2.60 **Reliability grade.** The definition for this measure is documented. The process of condition inspections is subjective, and there has been little guidance from Network Rail. We believe the M8 measure should have a reliability grade of C.
- 1.2.61 **Accuracy grade.** We remain concerned as to the number of SCMI examinations from previous years which are being reported as new condition grades in 2008/09. We believe the M8 measure should have an accuracy grade of 3.

### Signalling failures (M9)

- 1.2.62 **Performance.** There were 19,622 incidents attributed to signalling failures causing more than 10 minutes delay; this is an improvement of 1.5% from 2007/08.
- 1.2.63 **Regulatory target.** The regulatory target for this measure has been met.
- 1.2.64 **Reliability grade.** The documentation and reporting of this measure is exactly the same as last year and is as follows. A documented process has been followed to collect and report this measure. The commentary is based on data from the FMS system, which is separate to TRUST. Steps are being taken in some areas to align TRUST and FMS data. This may result in delays attributed to signalling failures being reduced due to re-attribution of faults. The commentary provided by Network Rail is based on performance reporting and knowledge of the signalling asset performance from a wide range of engineering and maintenance activities. M9 gives a consistent measure across the Routes. We believe that M9 should have a reliability grade of C.
- 1.2.65 **Accuracy grade.** The process remains the same as last year and is defined as follows. We believe that M9 should have an accuracy grade of 2.

### Signalling asset condition (M10)

- 1.2.66 **Performance.** 65% of assets assessed to date using the SICA methodology were in the top two condition grades; 98% were in the top three. For Level Crossings, 74% of crossing are in the band 2 (10 to 20 years remaining life)
- 1.2.67 **Regulatory target.** The regulatory target for this measure has been met.
- 1.2.68 **Reliability grade.** The SICA assessment process remains unchanged from last year. A documented process has been followed to collect and report this measure. The process has been carried out by competent personnel and adequate documentation is available. We believe that M10 should have a reliability grade of B.
- 1.2.69 **Accuracy grade.** The assessment process for determining remaining asset life is subjective. However, a peer review which provides an independent check on the accuracy of the resulting SICA scores against experience is carried out as part of the overall SICA process. The process for carrying out the assessments and producing condition reports remains robust, but is slightly subjective. The procedures for entry of data are still not documented. There is still no simple check to confirm that data has been entered correctly. We believe that M10 should have an accuracy grade of 2

### Traction power incidents causing train delays (M11 & M12)

- 1.2.70 **Performance – M11.** For 2008/09, the result reported by Network Rail was 66, which is an increase of 5% from the number reported in 2007/08.
- 1.2.71 **Performance – M12.** For 2008/09, the result reported by Network Rail was 14, which is a decrease of 36 from the number reported in 2007/08
- 1.2.72 **Regulatory target.** The regulatory target for this measure has been met.

- 1.2.73 **Reliability grade.** The definitions for these measures are clearly documented; however the procedure has not been updated following the re-organisation in Network Rail in September 2009. The process flow chart therefore does not contain the correct procedure or job descriptions. The process outlined by the delivery units was also not consistent. The process of correctly identifying the root cause of incidents attributed to overhead line or conductor rail components is not a simple process and the number of minutes attributed to a delay is known to be a subjective process. We believe that M11 and M12 should have a reliability grade of B.
- 1.2.74 **Accuracy grade (M11).** Our samples found the data was recorded in the Headquarters spreadsheet was accurate and correlated to that provided by the IMPMs and the reasons for rejected incidents were valid. We believe that M11 should have an accuracy grade of 2.
- 1.2.75 **Accuracy grade (M12).** The number of conductor rail component incidents reported for M12 is insufficiently large to support a numeric assessment of the accuracy of this measure. Our samples found the data was recorded in the Headquarters spreadsheet was accurate and correlated to that provided by the IMPMs and the reasons for rejected incidents were valid. The accuracy grade for M12 is therefore 'X' to indicate that an accuracy grade cannot be properly described.

### Electrification condition – a.c. traction feeder stations & track sectioning points (M13)

- 1.2.76 **Performance.** Based on the new methodology, 32of assets were in condition grade 3 98% were in the top four for 2008/09.
- 1.2.77 **Regulatory target.** Achievement of the regulatory target for this measure can not be assessed.
- 1.2.78 **Reliability grade.** There was no data collected against M13 this year due to the revised process not being formally approved and issued by Network Rail However a baselining exercise was carried out to obtain for baseline for Control Period (CP4). As this exercise has not been carried out in accordance with the M13 process we cannot assignment a reliability grade to this measure, therefore we believe that M13 should receive a reliability grade of X.
- 1.2.79 **Accuracy grade.** Our comment for the accuracy grade for M13 is as above in 1.1.18. Therefore we believe that M13 should receive an accuracy grade of X.

### Electrification condition – d.c. substations (M14)

- 1.2.80 **Performance.** Based on the new methodology, 41% of assets were in condition grade 3; 100% were in the top four.
- 1.2.81 **Regulatory target.** Achievement of the regulatory target for this measure can not be assessed.
- 1.2.82 **Reliability grade.** There was no data collected against M14 this year due to the revised process not being formally approved and issued by Network Rail. However a baselining exercise was carried out to obtain for baseline for Control Period (CP4). As this exercise has not been carried out in accordance with the M14 process we cannot assign a reliability grade to this measure, therefore we believe that M14 should receive a reliability grade of X.
- 1.2.83 **Accuracy grade.** Our comment for the accuracy grade for M14 is as above in 1.1.18. Therefore we believe that M14 should receive an accuracy grade of X.

### Electrification condition – a.c. traction contact systems (M15)

- 1.2.84 **Performance.** 93% of assets assessed to date using the ECAP methodology were in the top two (out of five) condition grades; 100% were in the top three.
- 1.2.85 **Regulatory target.** The regulatory target for this measure has been met.

- 1.2.86 **Reliability grade.** The definition for this measure is clearly documented. A single documented process has been followed to collect and report this measure; however as last year data from only a portion of network has been considered. We believe that M15 should have a reliability grade of C. However we have concerns that the limited data may not accurately reflect the nationwide condition.
- 1.2.87 **Accuracy grade.** Our samples found the data was recorded accurately in the spreadsheet held in the project team that is conducting the trial. However, the process of condition assessment is subjective. We believe that M15 should have an accuracy grade of 3.

### Electrification condition – d.c. traction contact system (M16)

- 1.2.88 **Performance.** 78% of assets assessed to date using the ECAP methodology were in the top two (out of five) condition grades; 97% were in the top three.
- 1.2.89 **Regulatory target.** The regulatory target for this measure has not been met.
- 1.2.90 **Reliability grade.** The definition and procedure for this measure is clearly documented and has been followed this year. The process of condition assessment is subject to extrapolation. We believe that M16 should have a reliability grade of C.
- 1.2.91 **Accuracy grade.** The calculation of wear is largely extrapolated using historic wear rates for different rail types and estimated levels of wear for when the dates of wear measurements have been lost. The condition grade is directly based on this extrapolated data. We believe that M16 should have an accuracy grade of 4.

### Station condition index (M17)

- 1.2.92 **Performance.** Neither the SCI and SSM scores have been reported this year.
- 1.2.93 **Regulatory target.** Achievement of the regulatory target for this measure can not be assessed.
- 1.2.94 **Reliability grade.** The definition and procedure for this measure is approved. There is uncertainty over the number of stations which form the SSM sample, with the number provided by Network Rail differing from that in the database. We believe that M17 should have a reliability grade of C.
- 1.2.95 **Accuracy grade.** Network Rail has provided a score for this measure. However we have issues around how the score is calculated.

### Light maintenance depot – condition index (M19)

- 1.2.96 **Performance.** 48% of assets assessed to date using the depot condition assessment methodology were in the top two (out of five) condition grades; 99% were in the top three.
- 1.2.97 **Regulatory target.** The regulatory target for this measure has been met.
- 1.2.98 **Reliability grade.** The definition for this measure is clearly documented. A documented process has been followed to collect and report this measure. The data from the inspections is subjective although an attempt has been made to assess the asset condition against measurable criteria. We believe that M19 should have a reliability grade of B.
- 1.2.99 **Accuracy grade.** We found a number of errors in the LMD inspection reports on a number of occasions which had not be corrected at the time of writing this report and would impact the asset score. There are still shortcomings in the process in both report checking and Headquarters audit. We believe M19 should have an accuracy grade of 4.

### Network Rail Asset Stewardship Incentive Index (ASII)

- 1.2.100 **Performance.** The ASII for 2008/09 was reported as 0.634, which represents a 12% improvement in the ASII figure from 2007/08. This reflects an improvement in nearly all of the constituent elements of the index. However structures and earthworks TSRs have shown a slight worsening of the situation.

- 1.2.101 **Regulatory target.** The regulatory target for this measure has been met.
- 1.2.102 **Reliability grade.** We believe that the reliability grade given to ASII should be a weighted average of all its constituent parts. When the reliability grades are given in numeric equivalents (e.g. A=1, B=2, etc.) and these are weighted, the result is 1.6, which equates to a grade B. We therefore believe that the ASII should have a reliability grade of B.
- 1.2.103 **Accuracy grade.** This measure is a composite of other measures in the Annual Return 2009. Due to the inherent nature of the confidence grading system we do not believe it is sensible to provide an accuracy score for ASII based on either weighting the accuracy grades of the constituent measures, or on a subjective assessment. We believe that ASII should have an accuracy grade of 'X', indicating that an accuracy grade cannot be properly ascribed to the measure (as stipulated in the confidence grading guidance: Appendix D).

### Track Renewal Volumes (M20, M21, M22, M25)

- 1.2.104 **Performance.** Non-WCRM sleeper and ballast renewal rose between 2003/04 and 2006/07, but however fell in 2007/08 and again in 2008/09. Non-WCRM rail renewals increased between 2004/05 and 2005/06, fell over the next three years, but rose again in 2008/09. Non-WCRM full S&C renewals rose between 2003/04 and 2008/09. They have however fallen by 17% over the last 2 years..
- 1.2.105 **Regulatory target.** There is no regulatory target for this measure.
- 1.2.106 **Reliability grade.** The definition for this measure is clearly documented. A single documented process has been followed to collect and report the high level summary data for this measure as well as at the individual job level. We believe that the track renewals measures (M20, M21, M22, M25) should have a reliability grade of B.
- 1.2.107 **Accuracy grade.** The data reported by the II teams has been audited and found to be accurate. There were however concerns over the change control processes being followed. For maintenance delivered projects, there are issues over the accuracy of the data reported in the OP database. We believe that the track renewals measures (M20, M21, M22, M25) should have an accuracy grade of 2.

### Signalling Renewed (M24)

- 1.2.108 **Performance.** There has been a reported decrease in the number of SEU renewed in 2008/09 as compared to the previous reporting period. A total of 1,031 SEU were reported as being renewed as compared to the Network Rail Business Plan target of 1,109. This represented a 28% decrease compared to 2007/08.
- 1.2.109 **Regulatory target.** There is no regulatory target for this measure.
- 1.2.110 **Reliability grade.** The definition is now defined in NR/ARM/M24 and the procedure for this measure is clearly documented. The adjustment for partial renewals is carried out at HQ where the details and the nature of the schemes may not be known exactly. However, the process is sufficiently linked to programme management to give a reliability grade of C.
- 1.2.111 **Accuracy grade.** The calculation of SEU renewed is open to a little interpretation, but should be capable of reasonable accuracy by following the procedure and using the agreed definitions. Out of the 3 schemes audited, we were unable to verify the reported SEUs for 1 scheme. We believe M24 should have an accuracy grade of 4.

### Structures Renewal & Remediation Volumes (M23, M26, M27, M28, M29)

- 1.2.112 **Performance.** The number of bridges, culverts, retaining walls, earthworks and tunnels renewals works undertaken (greater than the threshold values) rose in 2008/09, as compared to 2007/08..
- 1.2.113 **Regulatory target.** There is no regulatory target for this measure.

- 1.2.114 **Reliability grade.** The definitions for these five measures are clearly documented. A single documented process has been followed to collect and report the data for these measures. We believe that the measures M23, M26, M27, M28, and M29 should have a reliability grade of A.
- 1.2.115 **Accuracy grade.** We audited a sample of individual projects in 2 Routes. Of the 8 schemes audited, the square area reported for all schemes matched those in the as-built drawings. We believe that the measures M23, M26, M27, M28, and M29 should have an accuracy grade of 2.

## Safety

- 1.2.116 **Performance.** The Accident Frequency Rate for Network Rail employees and contractors for 2008/09 was 0.231. This is a 3% increase in the figure reported in 2007/08. The number of Infrastructure Wrongside Failures has fallen by 14.3% over the year. Over the year 2008/09 the Moving Annual Average for level crossing misuse (measured as equivalent collisions) has risen from 28.46 to 31.46 although this is still below the MAA of 32.23 recorded in 2005/06. The level of actual collisions (car and pedestrian) is 33, an increase of 17 from 2007/08. The number of Category A SPADs decreased from 354 in 2007/08 to 294 in 2008/09. Performance against the Criminal Damage measure shows significant improvement over the 2007/08 position, with the number of absolute incidents reducing from 5.539 per 100 route miles to 4.883.
- 1.2.117 **Regulatory target.** There is no regulatory target for this measure.
- 1.2.118 **Reliability Grade.** Textual and data records are generally good but there are examples of inaccuracies, owing to inevitable dependence on human interpretation. We therefore believe that the reported Safety data should have a reliability grade of B.
- 1.2.119 **Accuracy Grade.** Some categories have a high level of accuracy as clear and accurate systems of data collection are available (e.g. SPADs, Level Crossings, and Wrong Side Failures). However given the difficulties in ensuring accuracy of reporting and data for some categories (e.g. Irregular Working and Criminal Damage), we believe that the reported Safety data should have an overall reliability grade of 3.

## Environment

- 1.2.120 **Performance.** We can confirm that an environmental policy exists and is disseminated throughout the organisation.
- 1.2.121 **Reliability grade.** Given that measurements and systems are in place but still in some respects in their infancy, we do not think it appropriate to yet award the highest grade, particularly as there are known gaps in some measures at present. We believe therefore that Environment should have a reliability grade of B.
- 1.2.122 **Accuracy grade.** Given that data gathering is subject to known gaps (e.g. emissions) we believe that Environment should have an accuracy grade of 3

## Maintenance Efficiency

### *Maintenance Budget Variance*

- 1.2.123 **Performance.** Variance against maintenance allowance is 31.5% which is slightly below target. 2004/05-2007/08 variance for maintenance expenditure normalised by ETMs is 34.5% which is better than target.
- 1.2.124 **Regulatory target.** The regulatory target for this measure has been met.
- 1.2.125 **Reliability grade.** The ratio is calculated using data from the Regulatory Financial Statements. We believe the maintenance budget variance measures should have a reliability band of A.
- 1.2.126 **Accuracy grade.** The calculation, using data audited by the Regulatory Auditor, is correct. We believe the maintenance budget variance measures should have an accuracy band of 1.

### *Maintenance Unit Costs*

- 1.2.127 **Performance.** Assessing the percentage change in MUC (efficiency improvement for each of the measure reported), we find that 4 out of the 12 measures reported have shown an increase in value over the year.
- 1.2.128 **Regulatory target.** The regulatory target for 2008/09 is 5%
- 1.2.129 **Reliability.** The processes used to source the data for this measure are documented at a high level, frequently used and subject to a number of layers of internal check and review; the financial data is subject to external audit by others. It has been identified that each of the regions interpret the process differently and thus part of the variations in cost is correct but it is not possible to analyse what variations are due to inaccurate reporting. The data should have an overall reliability grade of C.
- 1.2.130 **Accuracy.** There is evidence of systematic errors in some of the unit cost data. Since the full year's data has been received, relatively few of these errors have been corrected. The data should have an overall accuracy grade of 5.

### **Renewals Efficiency**

#### *Renewal Unit Costs – Track*

- 1.2.131 **Performance.** 84.5% of track renewals expenditure has been reported as unit costs. Plain line track renewal efficiency is up from 10.8% last year to 12.1% this year. S&C efficiencies are reported, up from 9.9% last year to 10.5% this year.
- 1.2.132 **Reliability grade.** The processes used to source the data for this measure are documented, reviewed internally and externally as in previous years. The work-mix impacts the reliability of the efficiency results for the unit costs but is represented in the composite rates. We believe the unit cost indices and composite rates should have a reliability grade of B.
- 1.2.133 **Accuracy grade.** The processes used to source the data for this measure are frequently used and reviewed internally and externally as in previous years. The financial data is not solely based on final accounts, which may mean the reported data is subject to some inaccuracy. We have again found errors in the price rebasing, this year there has been no inflation applied for track for 2008/09 and the rates used between different asset areas vary. We believe the unit cost indices and composite rates should have an accuracy grade of 3.

#### *Unit Costs – Structures, Signalling & Telecoms*

- 1.2.134 **Performance.** Structures efficiency has improved by 5.3% this year to 30.3% over Control Period 3. Telecoms efficiency has not improved this year, therefore the figure remains at 25.7%. Signalling efficiency has improved by 11.4% this year.
- 1.2.135 **Reliability grade.** The processes used to source the data for this measure are documented, frequently used and subject to a number of internal and external checks. There have been a number of changes in the process this year which are provided in the report. These should provide more reliable data in CP4. The work-mix and solutions type impact the reliability of the efficiency results for the unit costs. We believe the unit cost indices and composite rates should have a reliability grade of B.
- 1.2.136 **Accuracy grade.** The processes used to source the data for this measure are frequently used and subject to internal and external checks. The financial data is based on final accounts. We therefore believe the unit cost indices and composite rates should have an accuracy grade of 2.

#### *Renewals Budget Variance*

- 1.2.137 **Performance.** The total renewals budget shows a 24% level of efficiency, comprising strong performances in all asset classes except track which achieved 16% efficiency.

- 1.2.138 **Reliability grade.** The procedure for this measure is documented. However, there was evidence of the categorisation process is not being followed correctly. We believe the Renewals Budget Variance analysis should have a reliability grade of B.
- 1.2.139 **Accuracy grade.** There was some discrepancy in the figures reported into the Finance team by the asset areas and that reported in the Annual Return by the Finance team and therefore some estimation measures, as outlined above, were used to determine the attribution of the variance over the various categories. There were also differences in the Renewals Variance figures reported by the asset teams and those reported in the NR Annual Return as shown in table 1.1.7. We believe the Renewals Budget Variance analysis should have an accuracy grade of 3.

#### *Renewals Efficiency*

- 1.2.140 **Regulatory target.** Using a combination of the unit cost and renewals budget variance data to assess Network Rail's performance, the regulatory target for renewals efficiency has not been met.

#### **Debt/ RAB Ratio**

- 1.2.141 **Performance.** The results for 2007/08 show that Network Rail's net debt as a percentage of its RAB was 70% which meets the requirements of its Network Licence.
- 1.2.142 **Regulatory target.** There is no regulatory target for this measure.
- 1.2.143 **Reliability grade.** The ratio is calculated using data from the Regulatory Financial Statements. We believe the Debt to RAB Ratio should have a reliability band of A.
- 1.2.144 **Accuracy grade.** The calculation, using data audited by the Regulatory Auditor, is correct. We believe the Debt to RAB Ratio should have an accuracy band of 1.

#### **RAB Volume Incentive**

- 1.2.145 **Performance.** The current forecast RAB adjustment for Control Period 3 reported in the Annual Return and the Regulatory Accounts is £581.5m (2008/09 prices).
- 1.2.146 **Regulatory target.** There is no regulatory target for this measure.
- 1.2.147 **Reliability grade.** The data is from reliable sources. However, as reported in previous years, the baseline has been back-calculated following a change to two underlying datasets which needs to be further documented as it will directly change the 2008/09 result. We believe the RAB Volume Incentive should have a reliability grading of B.
- 1.2.148 **Accuracy grade.** This year actual RPI (November) figures from ONS have been used to calculate the RAB volume incentive for the 2008/09 NR Annual Return. The baseline has been subject to change and the underlying reason has not yet been fully explained. We believe the RAB Volume Incentive should have an accuracy grading of 3.

## 1.3 Confidence grades and results against targets

1.3.1 The ORR Access Charges Review 2003 reset targets for Control Period 3 (2004/05-2008/09); the targets for 2008/09 shown in Figure 1.3.1 are further described in our audit commentaries.

1.3.2 The colour coding in Figure 1.3.1 is based on the targets:

- (a) Red: outside nominal target (target missed);
- (b) Green: inside the nominal target (target achieved).
- (c) Grey: no regulatory target set.

Measure	Confidence Grade	2008/09 Target	2008/09 Result
Operational Performance (NR caused delay (million minutes) & Total delay minutes/100 train km)	A1	≤9.8	8.84
		≤1.8	1.59
Customer & Supplier Satisfaction	A1	n/a	n/a
Joint Performance Process (JPP)	A1	n/a	n/a
Cancellations & Significant Lateness	C3	n/a	n/a
Linespeed capability (C1)	B2	n/a	n/a
Gauge capability (C2)	B2	n/a	n/a
Route availability value (C3)	B2	n/a	n/a
Electrified track capability (C4)	B2	n/a	n/a
Mileage (Passenger)	B2	n/a	n/a
Mileage (Freight)	B2	n/a	n/a
Management of Late Disruptive Possessions	B3	n/a	n/a
Freight Gross Tonne Miles	B2	n/a	n/a
Number of broken rails (M1)	A1	≤300	164
Rail defects (M2)	B3	n/a	n/a
Track geometry (M3 & M5)	A1	13 targets	All 13 met
Condition of asset temporary speed restriction sites (M4) (Number & Severity)	B2	≤942	438
		≤4,622	2,284
Earthworks Failures (M6)	A2	≤47	61
Bridge condition (M8)	C3	n/a	n/a
Signalling failures (M9)	C2	≤28,098	19,622
Signalling asset condition (M10)	B2	≤2.5	2.39
Traction power incidents causing train delays (M11)	B2	≤107	66
Traction power incidents causing train delays (M12)	BX	≤30	14
Electrification condition – a.c. traction feeder stations & track sectioning points (M13)	XX	n/a	2.78
Electrification condition – d.c. substations (M14)	XX	≤2.2	2.53
Electrification condition – a.c. traction contact systems (M15)	C3	≤1.8	1.7
Electrification condition – d.c. traction contact system (M16)	C4	≤1.8	1.9
Station condition index (M17)	C3	n/a	2.48
Light maintenance depot – condition index (M19)	B4	≤2.63	2.49
Network Rail Asset Stewardship Incentive Index (ASII)	BX	≤0.90	0.596
Track Renewal Volumes (M20, M21, M22, M25)	B2	n/a	n/a
Signalling Renewed (M24)	C4	n/a	n/a
Structures Renewal & Remediation Volumes - (M23) (M26, M27, M28, M29)	A2	n/a	n/a
Safety	B3	n/a	n/a
Environment	B3	n/a	n/a
Maintenance Efficiency: Budget Variance	A1	≥28%	31.5%
Maintenance Efficiency: Unit Costs	C5	n/a	n/a
Renewals Efficiency: Unit Costs – Track	B3	≥26%	18.3%
Renewals Efficiency: Unit Costs – Structures, S&T	B2		
Renewals Efficiency: Budget Variance	B3		24.0%
Debt/ RAB Ratio	A1	n/a	n/a

Measure	Confidence Grade	2008/09 Target	2008/09 Result
RAB Volume Incentive	B3	n/a	n/a

Figure 1.3.1 Confidence grades targets and results for measures in Annual Return 2009

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## 3 Introduction

### 3.1 Background

3.1.1 As part of the Office of Rail Regulation's Periodic Review of Network Rail's Access Charges for Control Period 2 (2000/01-2005/06), a number of changes were implemented to improve information reporting arrangements through modifications to Network Rail's network licence. In summary, Network Rail was required:

- (a) To prepare more detailed regulatory accounts which are consistent with the basis on which the price controls are established;
- (b) To ensure that enhancement expenditure is separately reported alongside information on those enhancements implemented;
- (c) To appoint Reporters (chosen by the Regulator in consultation with Network Rail) to provide an independent assessment of the robustness of Network Rail's information submissions; and,
- (d) To provide an Annual Return (plus some monthly returns) to report data for the previous year and compares this with both historical data and baselines underlying the periodic review.

3.1.2 In accordance with these requirements, Network Rail produces an Annual Return which contains measures of operational performance, asset condition and serviceability, renewals volumes, network capability, a reconciliation of the forecast expenditure set out in the Business Plan against actual expenditure and other performance indicators by agreement.

3.1.3 As Reporter A, Halcrow was previously responsible for reporting on part of Network Rail's Annual Return (shared with Reporter B, Mouchel Parkman) and Network Rail's Asset Register. Reporter B was also responsible for reporting on WCRM Project. This contract was for October 2002 – November 2005.

3.1.4 Halcrow have been appointed to Parts A and D of the new contract. The contract is for December 2005 – December 2008, with an option for 6-monthly extensions of up to two years. The other Reporters are shown in the Figure 3.1.1 below.

<b>Contract Schedule</b>	<b>Reporter</b>
Part A: Annual Return	Reporter A (Halcrow)
Part B: Information Network	Reporter C (Scott Wilson)
Part C: Asset Management	Reporter D (AMCL)
Part D: Major Projects	Reporter A (Halcrow) <sup>1</sup>

**Figure 3.1.1 Allocation of Reporting Role to Reporters**

<sup>1</sup> Reporter B (Mouchel Parkman) retains WCRM monitoring to Nov-2006.

## 3.2 This report

- 3.2.1 This report is Reporter A's Final Report on Network Rail's Annual Return 2009 in respect of the 2008/09 financial year.
- 3.2.2 A programme of audits took place in March, April, May and June 2009 at the offices of Network Rail's Headquarters, Routes and Areas as appropriate. At each audit, the personnel responsible for the collection and collation of the data for each measure were interviewed and the data collection systems, written documentation and supporting data made available were reviewed.
- 3.2.3 In order to gain the most value from the audit programme, the audit scope and any data requests for individual meetings were developed by our reporting team in advance of the audits and provided to Network Rail where appropriate.
- 3.2.4 The aims of the Annual Return audits were:
- (a) To give an opinion on the accuracy and reliability of the data reported by Network Rail in the Annual Return, by:
    - (i) Assessing the collection and reporting process against written definitions and procedures or best practice;
    - (ii) Checking the numerical data is correctly published;
    - (iii) Providing a 'confidence grade' for each measure;
  - (b) To compare the reported data with the regulatory target;
  - (c) To provide advice on:
    - (i) Any notable changes or trends in the data;
    - (ii) Context or causation of these changes or trends; and
    - (iii) Asset stewardship implications;
  - (d) Identifying problems, best practice and opportunities for future improvements;
  - (e) To evidence our audit report using soft or hard copy audit trails and meeting notes.
- 3.2.5 The details of all meetings and site visits attended by the reporting team are shown in Appendix C to this report.

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## 4 Assessment of compliance

### 4.1 Compliance with requirements

#### Access to information and timing

- 4.1.1 Under the terms of our contract, Network Rail are obliged to provide full access to data, information and personnel required for our reporting team to carry out the audits.
- 4.1.2 We can confirm that we received the necessary co-operation from Network Rail in organising and attending meetings and providing most the information necessary for preparation of our report.
- 4.1.3 We note, however, that due to the timing of the audits, not all the data and evidence was available for some measures prior to or during the audit meetings. For this Final Report we have received all the data and evidence requested.

#### Audit organisation and preparation

- 4.1.4 Due to the functional organisation of Network Rail, audit meetings have been organised individually between the auditor(s) and auditee(s) rather than coordinated by Network Rail personnel at each location, or through the Headquarters champions. Generally, the organisation of the audits with Headquarters, Route and Area personnel has been good with minor exceptions.
- 4.1.5 The extent of preparation for audits varied considerably between Network Rail personnel. In some audits it was clear that there had been significant preparation, with copies of the reported figures, local procedures, and in some cases, supporting audit trails provided before or at the meetings. In other cases, the preparation was much less complete.

#### Form and Content

- 4.1.6 Network Rail's Annual Return 2009 is compliant with ORR's requirements as set out in the "Form of the 2009 Annual Return".
- 4.1.7 For the last two years we have identified the following issues with the general report format of the Annual Return:
- (a) There was an inconsistency in units and the rounding of figures which impacted the ability to discern trends; this was particularly the case for the average condition measures (M6, M8, M13, M14, M15, M16, M17, M19);
  - (b) The format of tables in the Annual Return was subject to change without approval, leading to presentation of data that was not required and loss of data that was required for the purposes of trend analysis.
- 4.1.8 We note that these issues have not been rectified in Network Rail's Annual Return 2009.

## 4.2 Regulatory targets

4.2.1 The ORR Access Charges Review 2003 set targets for Control Period 3 (2004/05-2008/09); the targets for 2008/09 are further described in our audit commentaries. Figure 4.2.1 shows Network Rail's performance against the regulatory targets reported in the Annual Return.

4.2.2 The colour coding in Figure 4.2.1 is based on the targets:

- (a) Red: outside nominal target (target missed);
- (b) Green: inside the nominal target (target achieved).

Measure	08/09 target	08/09 result
Operational Performance		
Total Network Rail caused delay (million minutes)	≤9.1	8.84
Total delay minutes/100 train kms (franchised passenger operators)	≤1.65	1.59
Number of broken rails (M1)	300	164
Track geometry (M3)		
35mm Top 50%	62.4	76.5
35mm Top 90%	89.2	94.6
35mm Top100%	97	98.8
35mm Alignment 50%	72.7	82.5
35mm Alignment 90%	92.9	96.2
35mm Alignment 100%	96.5	98.3
70mm Top 50%	63.6	78.3
70mm Top 90%	92.4	96.6
70mm Top 100%	95.3	97.9
70mm Alignment 50%	79.5	89.9
70mm Alignment 90%	95.8	98.3
70mm Alignment 100%	97.2	98.9
Track geometry – level 2 exceedences (M5)	0.9	0.50
Condition of asset TSRs (M4)		
Number	≤1,199	438
Severity	≤4,622	2790
Earthworks Failures (M6)	≤47	61
Signalling failures (M9)	≤28,098	19,622
Signalling asset condition (M10)	≤2.5	2.39
a.c. traction power incidents causing train delays (M11)	≤107	66
d.c. Traction power incidents causing train delays (M12)	≤30	14
Electrification condition – a.c. traction contact systems (M15)	≤1.8	1.6
Electrification condition – d.c. traction contact system (M16)	≤1.8	1.9
Light maintenance depot – condition index (M19)	≤2.7	2.52
Network Rail Asset Stewardship Incentive Index (ASII)	≤0.90	0.60

Figure 4.2.1 Performance against regulatory targets in Annual Return 2008

4.2.3 In 2008/09, Network Rail has bettered nearly all of the targets set in the ORR Access Charges Review 2003.

## 4.3 Confidence grades

- 4.3.1 Figure 4.3.1 shows the confidence grades our reporting team have assigned to describe the reliability and accuracy of the data in the 2009 Annual Return using the mandated grading system. Details of this grading system are set out in Appendix D of this report.
- 4.3.2 We have assigned confidence grades to each measure in the Annual Return. Our assessments are based on our audit findings which are described for each measure in our audit report and commentary.
- 4.3.3 These confidence grades may change during each audit cycle due to (a) changes in the methodology for collecting and reporting each measure and (b) each cycle adding to our understanding of Network Rail's reporting processes, allowing a more comprehensive application of the confidence grading system. These grades should be viewed in conjunction with the individual audit report and commentary for each measure to understand any variations in data quality year-on-year.

Measure	2009 Confidence Grade
Operational Performance	A1
Customer & Supplier Satisfaction	A1
Joint Performance Process (JPP)	A1
Cancellations and Significant Lateness	C3
Linespeed capability (C1)	B2
Gauge capability (C2)	B2
Route availability value (C3)	B2
Electrified track capability (C4)	B2
Mileage (Passenger)	B2
Mileage (Freight)	B2
Freight Gross Tonne Miles	B2
Management of Late Disruptive Possessions	B3
Number of broken rails (M1)	A1
Rail defects (M2)	B3
Track geometry (M3 & M5)	A1
Condition of asset temporary speed restriction sites (M4)	B2
Earthworks Failures (M6)	A2
Bridge condition (M8)	C3
Signalling failures (M9)	C2
Signalling asset condition (M10)	B2
a.c. traction power incidents causing train delays (M11)	B2
d.c. Traction power incidents causing train delays (M12)	BX
Electrification condition – a.c. traction feeder stations & track sectioning points (M13)	XX
Electrification condition – d.c. substations (M14)	XX
Electrification condition – a.c. traction contact systems (M15)	C3
Electrification condition – d.c. traction contact system (M16)	C4
Station condition index (M17)	C3
Light maintenance depot – condition index (M19)	B4
Track Renewal Volumes (M20, M21, M22, M25)	B2
Signalling Renewed (M24)	C4
Structures Renewal & Remediation Volumes (M23, M26-M29)	A2
Safety	B3
Environment	B3
Renewals Unit Cost – Track	B3
Renewals Unit Cost – Structures, Signalling & Telecoms	B2
Renewals Efficiency – Budget Variance	B3
Debt/ RAB Ratio	A1
RAB Volume Incentive	B3
ASII	BX

Figure 4.3.1 Confidence grades for the measures in Annual Return 2009



## **5 Audit report and commentary – Operational performance**



## 5.1 Operational Performance

### Audit scope

- 5.1.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2009, Section 1, Operational Performance, including Tables 1.1 – 1.32.
- 5.1.2 This section reports on:
- (a) Public Performance Measure (PPM; ORR KPI 2); the measure provides a simplified measure of lateness at destination of passenger trains and cancellations;
  - (b) Delays to all passenger and freight train services attributable to Network Rail (ORR KPI 3); the measure is defined as the total number of delay minutes greater than pre-defined thresholds (these generally being three minutes), all network delays created, pre-defined sub-threshold delays (e.g. for TSRs and poor adhesion), and other sub-threshold delays attributed in accordance with the delay attribution guidelines insofar as Network Rail is responsible for them;
  - (c) Delays to franchised passenger train services attributable to Network Rail;
  - (d) Infrastructure incidents recorded for attribution of delay (ORR KPI 4).
- 5.1.3 An end-to-end process audit has been undertaken to gain an understanding of the accuracy and validity of the whole process.
- 5.1.4 The audit included initial meetings with Network Rail's senior performance managers to understand the current process and changes since last year.
- 5.1.5 This was followed by three Route Audits (Sussex, Western and Scotland), the primary purpose being to establish whether the central processes were being applied locally, especially the attribution of faults in the TRUST system.
- 5.1.6 The audit was concluded with a meeting at Network Rail Headquarters where the proposed Annual Return data was worked backwards to the TRUST data to understand the level of automation and manual entry and therefore determine the reliability and accuracy of the data.

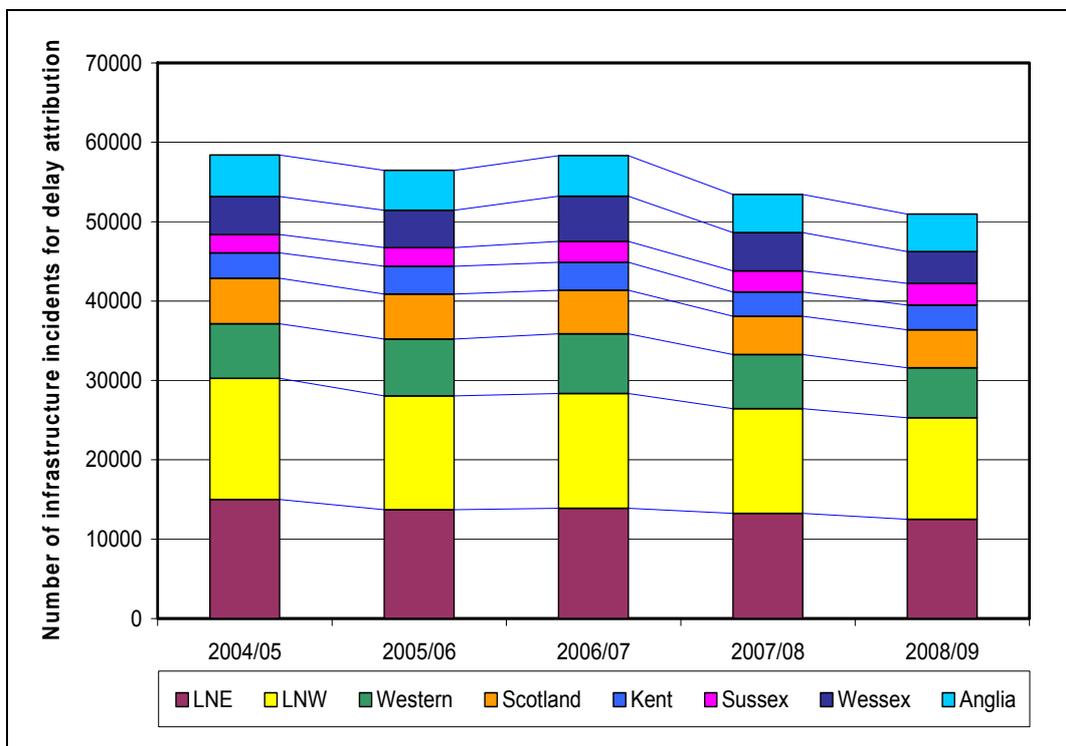
### Commentary on reported data

#### *Regulatory target*

- 5.1.7 Delay Minutes are a primary measure of Network Rail's operational performance. These are determined through the Delay Attribution process which requires that all train delays arising from an incident, for example track-circuit failure, are attributed to a specific code. Therefore it is possible to calculate the amount of delay attributed to types of infrastructure failure.
- 5.1.8 The ORR has set delay minute targets for each year of CP3 as an incentive to improve infrastructure performance on a declining trajectory as set out in the Access Charges Review 2003.
- 5.1.9 PPM is calculated by counting the number of trains which do not arrive late at the destination or which are cancelled, divided by the number of trains run. Lateness is defined as being at least 5 or 10 minutes late (depending on the type of service) against the public timetable. The result is expressed as a moving annual average (MAA). There has been no regulatory target for PPM during CP3.
- 5.1.10 There is no regulatory target for infrastructure incidents recorded for attribution of delay (ORR KPI 4).

*Trends*

- 5.1.11 Nationally, PPM have shown significant improvement from 83.6% in 2004/5 to the current level of 90.6% in 2008/9. The changes to franchise ownership and boundaries over the last five years have been significant; it is therefore difficult to draw comparisons at a TOC level.
- 5.1.12 Delay minutes and incidents have fallen again, continuing the previous downward trend. Delay minutes per 100km are also down again, and again continue a falling trend.
- 5.1.13 Year on year delay incidents due to asset failures at 50,961 are down overall by 5%, but broken down by route the picture is more variable. Asset failures are up 2% in Kent and Sussex, which are operationally similar areas. Best improvements were Wessex (17% down) and Midland and Continental (25% down). Fig 5.1.1 shows the trend graph for this set of delay causes.



**Figure 5.1.1 Number of infrastructure incidents per Route recorded for delay attribution**

- 5.1.14 Delays to train operators have fallen overall to 8.84m minutes. When normalised against train-km it is 1.78 mins/100 train-km. Train-km have increased in 2008/9, made up of an increase in passenger train-km and a fall in freight train-km.
- 5.1.15 Delays to passenger services per 100 train-km were 1.59 minutes, down from 1.74 in 2007/8.
- 5.1.16 Delays to freight services were down 11% in total on last year. Freight train-km fell 4%, so the delays per 100 train-km fell only 7.4%.
- 5.1.17 All categories of delay causation fell in terms of minutes caused, except for asset defects (excluding track and TSRs) and adhesion. However, these categories are relatively small contributors and do not detract from the gains made elsewhere. Furthermore, adhesion is historically a volatile area, with figures showing a variable trend over some years. Figure 5.1.2 shows the overall picture of delay minutes per 100 train-km broken down by cause.

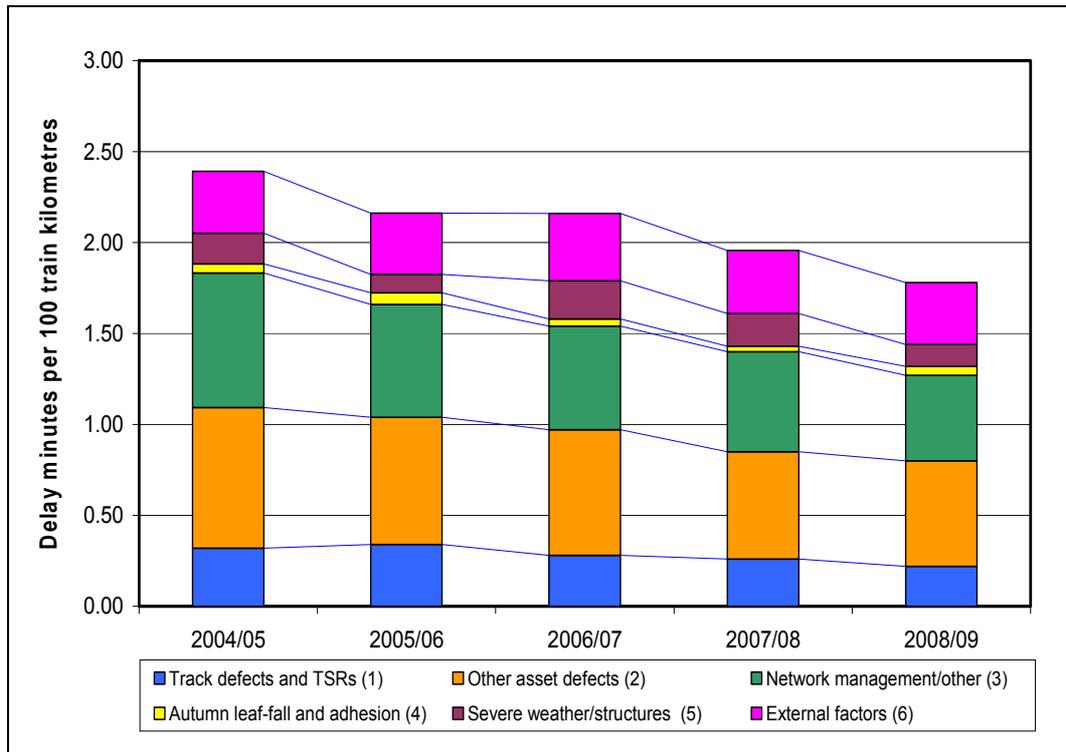


Figure 5.1.2 Delay Minutes per 100 train kilometres

## Audit findings

### Process

- 5.1.18 Delay minute data is captured in the TRUST train monitoring system. In most cases where there are track based train detection systems these entries are created automatically. However on some rural lines, for example those using RETB, entries have to be made manually. The entry requires that it is initially attributed to a particular fault (infrastructure or train). Where Network Rail or the TOC do not agree with the allocation there is a well established disputes process to resolve the allocation. This audit does not consider the disputes process.
- 5.1.19 For each incident of delay, the minutes associated with it have to be manually attributed to an owning party (the "Responsible Manager") and to a Cause Code using the TRUST system. There is a well established and documented process to ensure that Responsible Managers have the opportunity to challenge the attributions made to them and that such challenges are resolved. Specific guidelines for delay attribution are contained in the Delay Attribution Guide (DAG). This attempts to define all situations in which delay may occur, and specify the appropriate allocation of responsibility in each case to ensure that delay is attributed in a manner that is accurate and consistent. However, some issues over interpretation do inevitably still arise.
- 5.1.20 Delay data is processed using various systems including TRUST, PALADIN (the archive of TRUST data) and PUMPS. A suite of MS Excel and MS Access reporting files are used to monitor Network Rail's targets in relation to absolute delay minutes. Use of PALADIN/PUMPS is now being replaced by a new data warehouse (PSS) and reporting tools.
- 5.1.21 Given the contractual matrix of the industry and the financial penalties attached to train service performance failure, measures are well defined and data processes both well documented and implemented.

- 5.1.22 Continuous improvement processes are in place to ensure reporting is as accurate and consistent as it can be. For example, the Business Process Manual covering train service performance has been updated during 2008/09. A number of workstreams have contributed to its updating, including work on delay attribution and data capture (for example, timing and measurement; dealing with reports that are missing in TRUST and; actions to be taken in the event of a systems failure).
- 5.1.23 We examined the data logging and management process on three routes. Sussex is a densely trafficked route with largely homogenous train operations, while Western and Scotland are more varied in traffic and operational scenarios and densities. Each route was found to use the standard approach to delay monitoring and attribution with no significant variation observed to allow for local circumstances.
- 5.1.24 Delay attribution staff are found to be co-located with signalling or control centre staff for direct access to data. On the Sussex route, where signalling is highly centralised, delay attribution staff are located at the signalling centres and we observed them obtaining real time information as operational events unfolded. On the other two routes, signalling centres are far more dispersed and so delay attribution staff are located in the unified control centres. In one of these cases the control layout had been revised in order to ensure optimum lines of communication between desks so that delay attribution staff could monitor situations much more directly.

#### *Accuracy of reported data*

- 5.1.25 The audit team went through live and historic information with Network Rail staff and the execution of processes and data gathering all appeared to be in order. Extensive use was being made of CCF, a system which allows real time and historic analysis of train running situations, and can replay delay incidents in order to help resolve causes.
- 5.1.26 We also discussed with the route performance teams the process of verification of berthing offsets. Berthing offsets are formally recognised timing differences at delay reporting points. Their purpose is to ensure that the reporting point time correctly reflects the time required to be measured. For example, accurate performance monitoring needs to have reliable wheel start and wheel stop times. However at automatic reporting points there may be practical or technical constraints on the precise location of reporting equipment.
- 5.1.27 At manual reporting points there may be natural human variation or times may need to be taken from other activities to obtain an accurate report. For example in RETB signalled areas the most reliably reported time is that of token exchange. However, this is not the wheel start or stop time, and so the differential between train movement and token exchange needs to be measured and factored in for the purposes of performance measurement.
- 5.1.28 All three routes had similarly managed programmes in place for carrying out berthing offset checks in accordance with the laid down requirements. Data about the check programme and the results from individual checks are stored in Excel files and used to ensure that berthing offsets are up to date. Some difficulties were cited by the routes in locations where traffic is infrequent. This would tend to mean that while the minimum number of timings could be taken this would take longer than at busier locations and the latter would probably readily offer more samples giving a higher confidence that timings were representative.
- 5.1.29 The source of the data reported in the Annual Return is the Incident List database. This is a direct upload from PUMPS which also drives the regular performance reporting. Data quality checks are in place to ensure that reporting is accurate. There have been known problems when data is moved between systems so specific checks are made for that by Network Rail's Headquarters performance data team.

- 5.1.30 Over the years changes take place in the availability and policy for use of delay attribution codes. This means that reported year on year data is not necessarily comparable. In order to present a comparable history, previous year's data are manually adjusted to reflect the current attribution codes and definitions. There is a risk in this process that previous year's data may contain errors arising from the refresh process. However, whilst there will be subjective judgement, these refinements are small given the overall number of delay minutes and the benefit of comparable is outweighed by this risk.

#### *Training and competence*

- 5.1.31 During the time spent with the route performance teams we discussed the training and monitoring requirements for delay attribution staff. In each case we found that a standard process was in place laying down training and assessment arrangement and requirements. Staff are assessed on both competence and confidence and are subject to regular reviews of their work. Arrangements exist for retraining if necessary.

#### **Assessment of confidence grade**

- 5.1.32 **Reliability grade.** The definition of these measures is documented. Network Rail has established procedures to report and analyse delay information. We believe that Operational Performance should have a reliability grade of A.
- 5.1.33 **Accuracy grade.** We believe that Operational Performance should have an accuracy grade of 1 due to the manual attribution process at the input level, limits of the recording system and a limited number of manual interventions in the final processing of the data.

#### **Audit Statement**

- 5.1.34 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2009 for Operational Performance. The data has been assessed as having a confidence grade of A1.

#### **Recommendations arising**

##### *Recommendations essential for the accuracy and/or reliability of the measure*

- 5.1.35 We have no recommendations for this measure.

##### *Observations relating to spreading of best practice and/or improvements to process*

- 5.1.36 We have no observations in relation to this measure.

#### **Progress on outstanding recommendations from previous audit reports**

- 5.1.37 There were no recommendations made as a result of last year's audit.

## 5.2 Customer & Supplier Satisfaction

### Audit Scope

- 5.2.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2009, Section 1, Customer and Supplier Satisfaction, including Tables 1.35 – 1.37.
- 5.2.2 These measures report on the way in which Network Rail is regarded by a range of its primary stakeholders.
- 5.2.3 The definition of this measure is documented in the ORR's KPIs list. No procedure is documented for this measure.
- 5.2.4 The measure relies on research techniques, and in particular, consumer research techniques, to gather the data from which it is drawn, which are constantly developing. We do not, therefore, deem it appropriate that the procedure for gathering the data should be prescribed over and above what is already in the ORR KPI definition. The content of and approach taken in the research are nevertheless agreed and then defined in the contract between Network Rail and the research contractor. Each contract therefore documents the agreed content and approach for the given year.
- 5.2.5 The data to produce the measures is gathered through primary research and specifically:
- (a) A survey of levels of satisfaction with Network Rail's performance as a supplier, as perceived by passenger train operators;
  - (b) A survey of levels of satisfaction with Network Rail's performance as a supplier, as perceived by freight train operators;
  - (c) A survey to measure levels of satisfaction amongst Network Rail's key suppliers.
- 5.2.6 Network Rail measures satisfaction using multi-question opinion surveys. The surveys are carried out by an external company. This year the work has been carried out by Ipsos MORI. The surveys contain a number of questions, designed to help Network Rail understand how customers and suppliers feel about doing business with the company.
- 5.2.7 The reported data is the average of the scores associated with the respondents' answers weighted for the population of respondents.
- 5.2.8 This audit was undertaken at Network Rail Headquarters with some discussions also taking place by e-mail correspondence and by telephone conference calls.

### Commentary on reported data

#### *Regulatory Target*

- 5.2.9 There is no regulatory target for these three measures. However, Network Rail's 2005 Business Plan sets an internal target of "year on year improvement".

#### *Nature of Survey Questions and Responses*

- 5.2.10 A single question from this survey is used to provide the data reported in the Annual Return; this question is "Which of these best describes how you feel about Network Rail?" The respondent chooses an answer from the following list:
- (a) I would be critical without being asked;
  - (b) I would be critical if someone asked my opinion;
  - (c) I would be neutral if someone asked my opinion;
  - (d) I would speak highly if someone asked my opinion;
  - (e) I think so much that I would speak highly of them without being asked.

- 5.2.11 The single question reported on provides an indication of Network Rail's reputation with its customers and suppliers. It does not provide an indication of the reasons for the responses given. However, the survey conducted does contain a range of questions that ask more detailed questions including:
- Perception of working relationships on a corporate, hierarchical, and personal level.
  - Perception of Network Rail understanding of customer needs.
  - Perception of communications with Network Rail.
  - Examples of positive and negative experience of Network Rail and areas where improvement is desired.

These questions are useful in understanding the reasons behind the answers, and give an indication to Network Rail of the key areas of concern amongst those surveyed. They also help to understand the differences in needs and perceptions in different types of stakeholders such as TOCs, FOCs, contractors and suppliers.

### *Trends*

- 5.2.12 Historic comparison over time may be of limited value as the structures of passenger franchises and freight operator ownership change.
- 5.2.13 The longer term trends with Network Rail are downwards. This suggests that strength of feeling has fallen for both positive and negative views and does not give much information on what can be done to address issues that the interviewees may have.
- 5.2.14 Trends in advocacy and Network Rail's understanding of stakeholder needs, it is the case that both positive views are in decline, and negative views are on the increase. In combination with the trends referred to in the previous paragraph the trends appear to indicate a gradual worsening of perception of Network Rail amongst its customers and suppliers. This suggests that work needs to be done in specific areas causing the levels of increasing dissatisfaction that these trends show.

## **Audit Findings**

### *Process*

- 5.2.15 The survey of customers and suppliers which collected the source data for this measure were both carried out by an external market research company, Ipsos MORI in October and November 2008. Ipsos MORI have particular expertise in this area of work and were selected for the work by Network Rail on the basis of competitive tender. They also conducted the 2006 and 2007 surveys.
- 5.2.16 The customer survey was designed to obtain feedback from all train and freight operating companies. However, whilst the objective was to cover Network Rail's whole customer population, not all individuals within these companies who work with Network Rail on a regular basis are included in the survey. A sampling frame was therefore designed to identify suitable respondents, across different function areas and interviews sought with at least one person for each function area for each company. The sample was weighted to reflect the relative size of each operating company. Weighting is based on % train kilometres; operators who use the network most heavily are thus represented in the survey more strongly than lighter users.
- 5.2.17 The audit team was provided with copies of the survey questions, the results and the specification and methodology for the survey. These all appeared to be in order.

- 5.2.18 The survey contractor sends out invitations to participate to the CEOs and top management teams for all TOCs and FOCs. The response rate is 82%, which is regarded as very good for this type of survey. Reasons for not participating tend to be practical and the survey contractor says it has no reason to believe that non-responses are due to any apathy or hostility. Line managers are not invited to take part; this has been tried in the past but response levels were not adequate. Furthermore it is felt that as higher management is responsible for a company's policy towards Network Rail they will base their views on the feedback they get from the ground.
- 5.2.19 310 invitations to take part were sent out and 254 interviews were carried by telephone with TOC and FOC managers. The number of respondents is higher than in the two previous years. The sample was representative of all operators, including open access ones.
- 5.2.20 All research is carried in accordance with best practice and in line with the Code of Conduct of the Market Research Society. Responses are anonymous, although respondents are invited to identify themselves if they wish. All data was collected and analysed through Ipsos MORI who have strong data and other quality processes in place.
- 5.2.21 Network Rail recognises that such surveys only provide one indicator of the strength of their relationships with customers and suppliers, a snapshot at a specific moment in time. However, it does provide guidance for managers. Data is analysed down to individual route level and disseminated to managers as part of the background to target setting and decision making in the company.

#### *Accuracy of Reported Data and Commentary*

- 5.2.22 The methodology of both surveys is now well established and represents an appropriate approach to this kind of work. The surveys are only part of the research programme carried out by Network Rail which uses additional studies to investigate specific issues with stakeholders in regard to its business activity. Other work undertaken by Network Rail includes additional research amongst smaller suppliers who are nevertheless critical to Network Rail's business as a result of the nature of the services they deliver. We note that as such the customer and supplier surveys from which the scoring for this measure is taken thus represent only part of the total picture of Network Rail's relationships with both customers and suppliers.
- 5.2.23 Both supplier and customer surveys are designed to help Network Rail understand where business and managerial effort needs to be targeted. From all the data in those surveys, only a single measure – the advocacy score – is reported on. This measure seeks to both measure and to understand how the individuals with whom Network Rail does business feel about the company. As such, it will always be an "imperfect" measure as people's emotions affect their responses on any one given day.
- 5.2.24 For supplier satisfaction, Network Rail have developed a Supply Chain Maturity Model (SCM3) in association with key members of their supply chain. It is currently a qualitative model but Network Rail is looking to develop a quantitative approach in 2009/10.
- 5.2.25 When comparing the reported results with the non-reported questions the survey results sometimes appear contradictory in that it is possible for the reported level of satisfaction to show a different perception of Network Rail than is necessary evidenced by individual question answers. It does not seem unusual for those surveyed to generally speak well of Network Rail on specific operational issues but to be more negative on the measured reputational question. Therefore the reported measure may be reporting what those surveyed are happy to say publicly as opposed to what their experience of Network Rail actually is. It should also be remembered that Network Rail, as a monopoly supplier, is not operating in the kind of commercial environment where questions of whether customers would recommend their services would be more clearly relevant. Instead such questions may elicit a more issue-specific response reflecting the respondents' views of strategic relationships with Network Rail and the wider rail sector.

- 5.2.26 Satisfaction surveys can be affected by a range of issues and represent how individuals feel about Network Rail on a particular day. As such, the measure is a qualitative, rather than a quantitative one. However we are satisfied that the methodology used by Network Rail to derive it is appropriate for the context. In the application of the surveys, and in the dissemination of the survey results,

#### *Organisational competencies*

- 5.2.27 The measurement of this score relies on specialist consumer research methodology. Network Rail currently has in house the competency to ensure that the required research is carried out in line with industry best practice.

#### **Assessment of confidence grade**

- 5.2.28 **Reliability grade.** We are satisfied that Network Rail has demonstrated to us a reliable process for conducting the customer and stakeholder surveys. We believe the satisfaction measure should have a reliability grade of A with the caveat that this is a qualitative measure and as such should be considered as only one of a range of KPIs for judging customer and stakeholder satisfaction.
- 5.2.29 **Accuracy grade.** We are satisfied that the weighting processes applied to the response rates are appropriate. We believe the accuracy grade should have a reliability grade of 1.

#### **Audit Statement**

- 5.2.30 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2009 for Customer and Supplier Satisfaction. We have examined the process used to produce the customer and stakeholder satisfaction report and we are satisfied that the survey process is robust and the results are statistically reliable. The data has been assessed as having a confidence grade of A1.

#### **Recommendations arising**

##### *Recommendations essential for the accuracy and/or reliability of the measure*

- 5.2.31 **Satisfaction recommendation 1.** The measure reported is a single element in a much wider survey. We believe there may be benefit in the development of a second score, potentially a composite measure based on a number of attitudinal and experiential questions.

##### *Observations relating to spreading of best practice and/or improvements to process*

- 5.2.32 **Satisfaction observation 1.** The true value of this survey is more likely to lie not in the scores themselves, but in the changes and improvements that Network Rail make based on this and other KPIs.

#### **Progress on outstanding recommendations from previous audit reports**

- 5.2.33 We set out below our assessment on the current progress of Network Rail in addressing our outstanding recommendations for Customer and Supplier Satisfaction from our previous Audits:

Recommendations made	Progress update
<p><b>2008-R02:</b> The measure reported is a single element in a much wider survey. We believe there may be benefit in the development of a second score, potentially a composite measure based on a number of attitudinal questions. However, we believe the true value of this survey lies not in the scores themselves, but in the changes and improvements that Network Rail make based on this and other KPIs.</p>	<p>This remains an aspiration for Network Rail, and is therefore carried forward to our 2009 recommendations. <b><i>Current Status – Repeated in later year.</i></b></p>

**Figure 5.2.1 Progress on outstanding recommendations for Customer and Supplier Satisfaction**

## 5.3 Joint Performance Process

### Audit Scope

- 5.3.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2009's section on Joint Performance Process (JPP).
- 5.3.2 The measure reports progress on the production of the annual Joint Performance Improvement Plans (JPIPs) as part of the Joint Performance Process (JPP). This measure does not report on the content of JPIPs.
- 5.3.3 The requirement to undertake a Joint Performance Process with Train Operating Companies (TOCs) and create the associated JPIPs was inherited from the Strategic Rail Authority in 2004 and included in the Network Code (condition LA) on 27 March 2006 from which all franchised TOCs opted-in from that date.
- 5.3.4 The audit comprised meetings with managers responsible for the production and maintenance of JPIPs. The JPIP for one major TOC was sampled. The sample was not random but was representative of both service mix and size of activity and was reviewed as the principal JPIP available for sampling.

### Commentary on reported data

#### *Regulatory Target*

- 5.3.5 There is no regulatory target for this measure as part of the Annual Return.
- 5.3.6 Notwithstanding this, our summary of the regulatory requirements on Network Rail in respect of this measure is:
- (a) Maintain governance arrangements for the process, including process/ procedural documentation;
  - (b) Maintenance of sufficient resources to develop JPIPs;
  - (c) Production of a programme for the annual production of JPIPs;
  - (d) Production of the JPIPs to meet the programme.
- 5.3.7 Network Rail has produced a set of governance structures with individual train operators, including process documentation and output templates, maintained sufficient staff to develop the JPIPs, and maintained JPIPs for all the franchised passenger train operators, although we note that sign off by the TOCs was not achieved for all plans.

### Audit Findings

#### *Process*

- 5.3.8 The Joint Performance Improvement Plan (JPIP) process forms a key part of the Joint Performance Process (JPP) which requires Network Rail and the train operators to establish combined plans to deliver coherent performance improvements. While JPIPs are owned at national level within Network Rail the improvements they specify generally have to be delivered at local level. Therefore individual JPIPs are produced for each TOC allowing organisational and geographic focus.
- 5.3.9 The main two metrics for measuring the success of JPIPs is the Public Performance Measure (PPM) and delay minutes. These measures are reported on in Section 5.1 of this document entitled Operational Performance. The PPM and delay minutes process and outputs reported on in that section should be read as confirmation of the effects of efforts made to improve performance. However, those data do not of themselves confirm a direct causation to the JPP or individual JPIPs.

- 5.3.10 The issue of whether measures could be directly attributed to improvements in the JPIPs was discussed with Network Rail. The view expressed by NR was that many of the schemes listed in the JPIPs were very small and direct attribution of performance improvements would be very difficult to achieve. Given the extent of data and knowledge about performance, we believe there may be some scope for using performance data relating to locations where improvements are planned in order to create “before” and “after” comparisons. This may help give an indication of the level of success that JPIPs are in practice achieving.
- 5.3.11 The process requires both parties to analyse jointly their current performance, identify and agree individual and joint actions in order for each party to deliver agreed targets based on (amongst other things) franchise commitments for train operators and regulatory obligations for Network Rail. The lead NR Route for each TOC works with that TOC to develop a JPIP. At national level a focus is maintained on getting maximum benefit across the network with the budgets for improvements being split amongst the JPIP areas accordingly.
- 5.3.12 Ultimately the success of the process relies on both parties working together. Our audit suggests that the success of this can vary across the network. This can be caused by the need to deal with differing priorities between TOC and Network Rail and may lead to some delays or failure in getting JPIPs agreed. However, at the time of reporting only one TOC JPIP is yet to finally be agreed, and this is for very route-specific reasons. This being the case we can conclude that any problems that may have occurred in getting JPIPs agreed have been overcome.
- 5.3.13 As stated last year, over the years since its introduction the JPIP process has moved from a compliance activity to a rolling process for delivering genuine and on-going improvement, and the documents, process and observations supplied by Network Rail indicated an ongoing commitment to real improvement.
- 5.3.14 However, the JPIP document that we were able to examine was highly detailed in comparison with what tends to be expected of and produced by the TOCs/Routes concerned. This suggests that concentration on compliance may still be an issue, though it has not been possible to independently assess this issue.
- 5.3.15 We have discussed the process for compilation and approval of JPIPs and the timescales involved, and are satisfied that a system is in place for the management and resourcing of JPIP production are in place.

### Assessment of confidence grade

- 5.3.16 **Reliability grade.** We believe that the audited measure should have a reliability score of A.
- 5.3.17 **Accuracy grade.** JPIPs are in place for audited Routes, which satisfies the terms of the audit. We believe therefore that the accuracy grade for the JPIP measure as presented in the Annual Return is therefore 1.

### Audit Statement

- 5.3.18 We have audited the reliability and accuracy of data and commentary presented in Network Rail’s Annual Return 2009 for Joint Performance Process. We are satisfied that adequate governance arrangements are in place, that Network Rail makes appropriate and adequate resources available for the good running of the Joint Performance Process, that an annual programme for updating the JPIPs and associated budgets is in place and clearly communicated, and JPIPs are produced in accordance with that programme. The data has been assessed as having a confidence grade of A1. There is no Regulatory target for this measure.

## Recommendations arising

### *Recommendations essential for the accuracy and/or reliability of the measure*

- 5.3.19 **JPP recommendation 1.** We recommend that a standard approach be considered for the presentation of JPIP information in order that documents are able to report essential information with other details left to the appropriate levels.
- 5.3.20 **JPP recommendation 2.** We recommend that a continuing emphasis be placed on achieving deliverables, including the investigation of developing means to better monitor direct causal links between improvement plans laid down in JPIPs and improvements in performance.

### *Observations relating to the spreading of best practice and/or improvements to process*

- 5.3.21 We have no observations to report.

## Progress on outstanding recommendations from previous audit reports

- 5.3.22 We set out below our assessment on the current progress of Network Rail in addressing our outstanding recommendations for JPP from our previous Audits:

Recommendations made	Progress update
<p><b>2008 R01</b> We recommended the links should continue to be monitored between the JPIP process and infrastructure maintenance and renewal plans.</p>	<p><b>Current Status</b> –Evidence has been provided of the processes in place for linking JPIP to infrastructure maintenance and renewal plans as well as to operational initiatives. This has included a breakdown of enumerated performance improvement targets by function and geographical area of responsibility. This recommendation is closed.</p>

**Figure 5.3.1 Progress on outstanding recommendations for Joint Performance Process (JPP)**

## 5.4 Cancellations and Significant Lateness

### Audit Scope

- 5.4.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return for 2009, Section 1, Cancellations and Significant Lateness (CaSL), including Table 1.33.
- 5.4.2 CaSL is defined as the number and percentage of passenger trains (franchised and open access operators) which are cancelled in part or full, or which arrive at their final destination 30 or more minutes later than the time shown in the public timetable.
- 5.4.3 The measure is designed to show the level of serious disruption passengers experience on the railway. Control Period 4 (CP4) sees the introduction of targets for CaSL, set at PPM Sector level.
- 5.4.4 Although CaSL is a new measure, it uses similar rules and definitions to PPM. Because of this, a lot of the information contained within this document will also be found in the PPM Definitions. Unlike PPM, CaSL has no formal definition written in any existing agreement or document, so information has only recently been produced and it is unclear how all the elements will connect and work together.
- 5.4.5 Unlike PPM, there is no formal CaSL target for Scotland, only for England and Wales. In practical terms, this means that First Scotrail is excluded from the Regional Sector for the CaSL measure.
- 5.4.6 Audits were undertaken as a desk top exercise with data and information requested from Network Rail and any questions requested and answered via email.

### Commentary on Reported Data

#### Definitions

- 5.4.7 **Cancellations and Significant Lateness (CaSL)** means the measure of the proportion of trains (expressed as a percentage of the number of trains which are scheduled to be provided under the Applicable Timetable in accordance with PPM) which are cancelled, or arrive significantly late at their final scheduled destination in the Applicable Timetable measured on the basis that:
- for this purpose, "significantly late" means arriving thirty minutes or more after the scheduled public arrival time at destination as shown in the *Applicable Timetable*;
  - any train which is a *Total or Other Cancellation* as measured by reference to the *Applicable Timetable* will be included in this measure;
- 5.4.8 "Applicable Timetable" means, in respect of any particular day, the passenger timetable which reflects the working timetable for the Passenger Services required to be drawn up by Network Rail in accordance with the Track Access Conditions, as at 2200 on the immediately preceding day, being the timetable for that particular day, as amended from time to time, including to reflect the following:
- any amendment to the working timetable for the Passenger Services under the applicable Rules of the Route or Rules of the Plan;
  - any amendment to the working timetable for the Passenger Services under Condition H of the Track Access Conditions; and
  - any amendment which is required to the Timetable to reflect the introduction, removal or alteration of a service (by the franchise operator).

#### Regulatory target

- 5.4.9 There are regulatory targets set for this measure as contained in the HLOS issued by the DfT. However, as stated in 5.4.5 above the figures for Scotland are only aspirational. Targets are set at both national and sector levels and these can be found in the figure 5.4.1 below, this shows the percentage of services effected.

5.4.10 The CaSL measure will be for all day, including weekends.

Sector	2009/10	2010/11	2011/12	2012/13	2013/14
Long Distance	4.9	4.5	4.2	4.0	3.9
London & South East	2.3	2.2	2.1	2.0	2.0
Regional	2.6	2.5	2.4	2.3	2.3
Total England & Wales	2.8	2.6	2.5	2.4	2.3

Figure 5.4.1 National and sector target CaSL levels

*Trends*

5.4.11 Whilst the measure is new, the data on which this measure is based has been historically captured by both the TOC's and Network Rail. Therefore it should in principle be possible to start to establish trends. However, these trends will need to be read in the light of any developments in the way the measure is arrived at.

5.4.12 The figures going back to period 1 of 1998 for all sectors are shown in figures 5.4.1 and 5.4.2. For long distance services, the trend line shows that CaSL are on a downward trend, but are still currently over 5%.

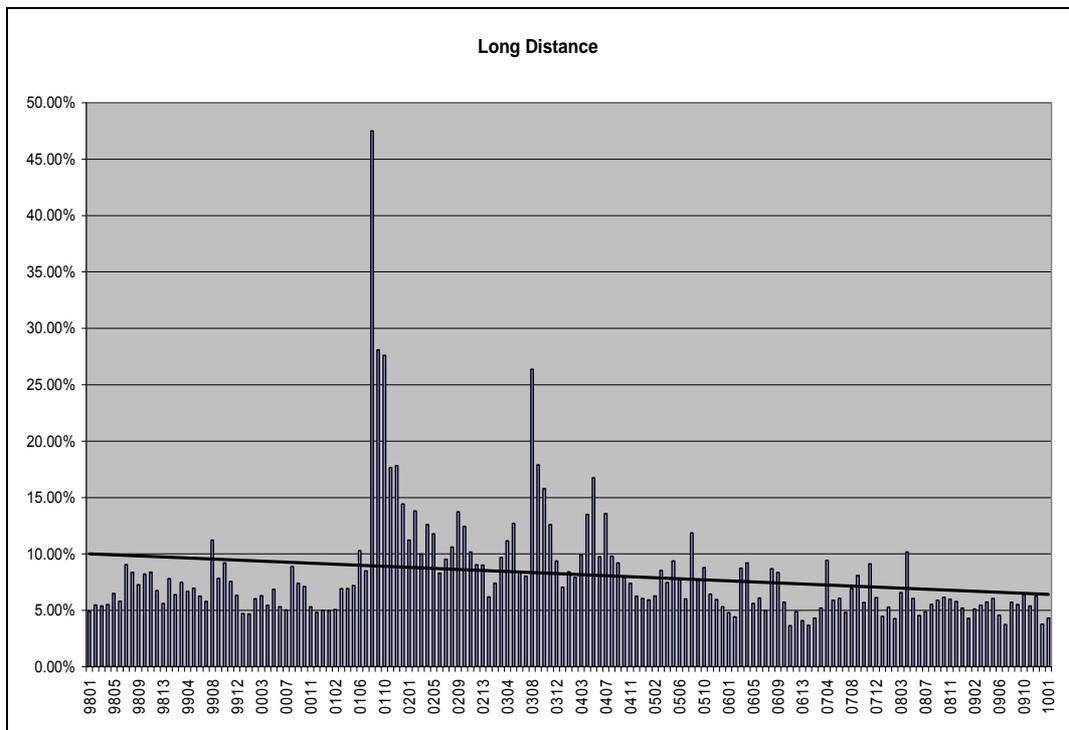


Figure 5.4.2 Long Distance CaSL trend

5.4.13 London & South East CaSL also are showing a downward trend and it can be seen that the forecast is set at 2.3 improving to 2.2 in 2010/11. However, it is still unclear how forecasts were set and what improvement plans have been put in place to ensure this downward trend is achieved.

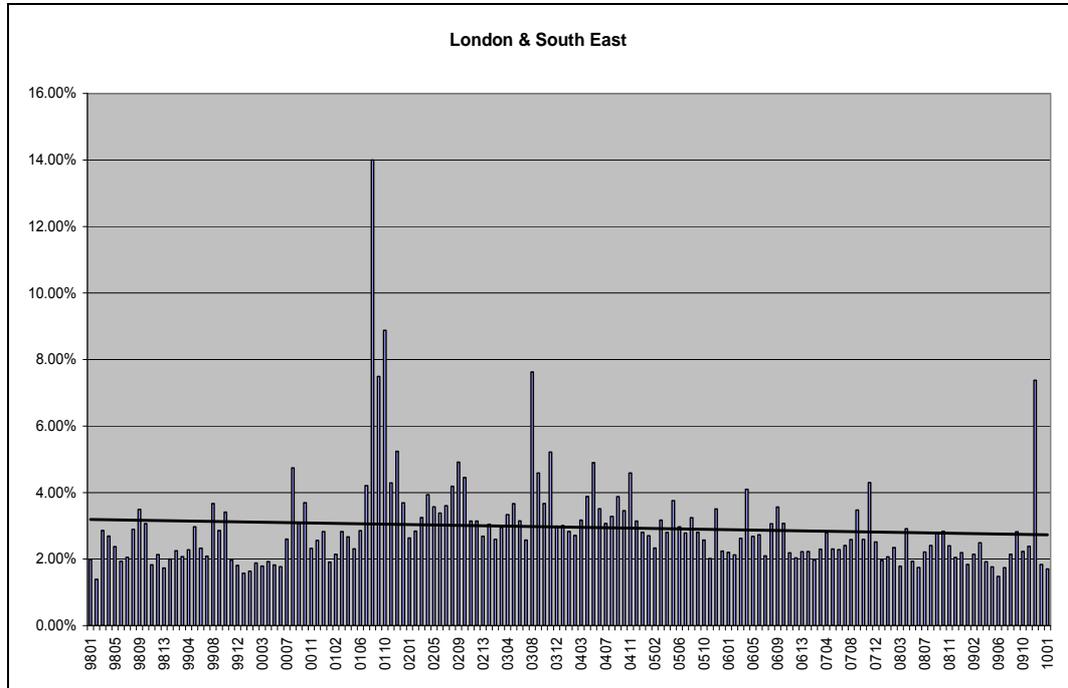


Figure 5.4.3 London & South East CaSL trend

5.4.14 Regional CaSL are far more flat lined in terms of improvements over the years as figure 5.4.4 below shows. We would have the same initial problems with determining if the forecast are achievable as with the London & South East sector, as we do not what improvement plans have been developed by the train operators to ensure that the predicted trends are delivered.

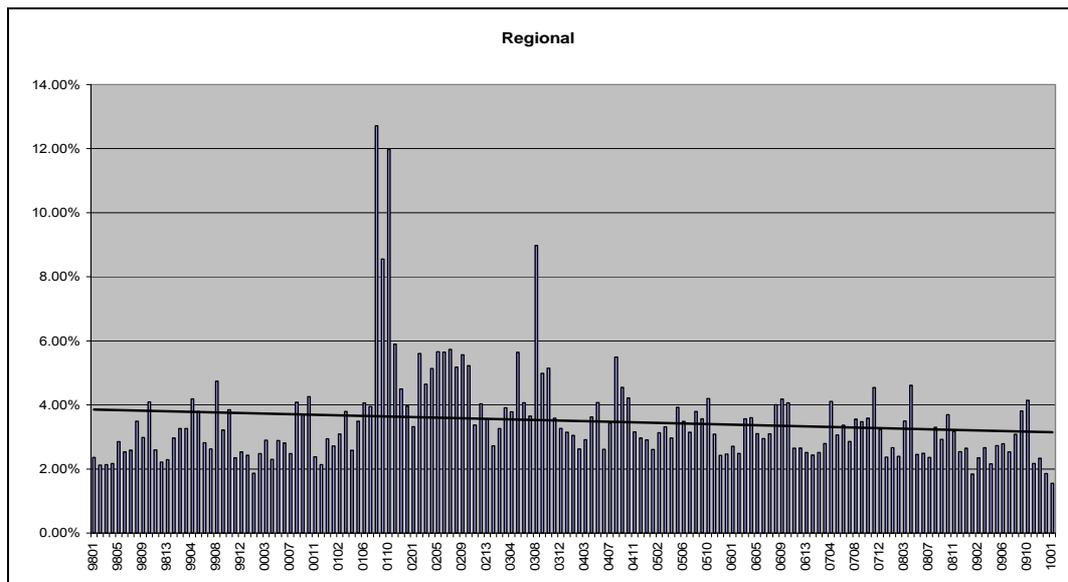


Figure 5.4.4 Regional CaSL trend

- 5.4.15 Looking at the data supplied on CaSL, it is clear this is the same data used to determine the Passengers' Charter Measurements. The method of data gathering is the same and the process of determining the percentage applicable to the CaSL measure is simply a division of planned trains against those late (over 30 min) and cancelled.
- 5.4.16 CaSL is always based on GBTT (Great Britain Timetable) timings, not WTT (Working Timetable) timings. This has assumed to be the timetable loaded into TRUST with the schedules marked 'Applicable' unless informed otherwise by the TOC and /or Network Rail.
- 5.4.17 CaSL is measured against all franchised passenger services with no exclusions. However, Network Rail has acknowledged that the information within source systems may not be complete at all times.
- 5.4.18 In reviewing the data no errors were found. However we did not have all the data to hand, such as action plans for improvement and the full process for ensuring train data is accurate. It is also recognised that in time all data will be provided by Network Rail performance systems, but this will not take place until data quality improvements have been made.

## Audit Findings

### *Process*

- 5.4.19 Two types of CaSL data is produced. These are described below.
- 5.4.20 **Provisional CaSL** – produced on the Monday of week 2 after period end. This includes the additional input of TOC cancellation data for some operators, and is also based on Day 8 TRUST data, meaning no more changes can be made to the TRUST data.
- 5.4.21 **Final CaSL** – should normally be produced by the end of week 4 after period end. This includes the additional input of TOC cancellation data for all operators, and is finalised after being sent to TOC performance contacts for any comments. It reflects any editing that has been done in the data following discussions with the TOCs and Routes.
- 5.4.22 This process is estimated to all the CaSL reported incidents.

### *Accuracy of Reported Data*

- 5.4.23 Clearly data accuracy improvements need to be implemented by Network Rail. This will then allow a single source of data to be used.
- 5.4.24 Once data quality improvements are made an increase in Network Rail's confidence in their reported data should be evident resulting in trend data from year to year more reliable and accurate.

## Assessment of Confidence Grade

- 5.4.25 **Reliability Grade.** We believe that the reported data for CaSL should have a reliability grade of C.
- 5.4.26 **Accuracy Grade.** We believe that the reported data for CaSL should have an accuracy grade of 3.

## Audit Statement

- 5.4.27 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2009 for CasL. This was presented by email from Network Rail in the form of historical data and outline documents on the proposed system for data capture going forward. Network Rail has acknowledged that steps need to be taken to improve the data quality and will be making improvements in this area. There is a large amount of data available mostly through data capture for the current Passengers' Charter and this has been used for this new measure to determine trends to allow forecast to be made. However, we have not had any data relating to improvement plans to calibrate the forecasts and from the data we have to hand it looks like basic trends have been followed through to determine forecasts. Once the data quality issues have been addressed greater confidence in interpreting trends in future will be allowed. The data has been assessed as having a confidence grade of C3

## Recommendations Arising

*Recommendations essential for the accuracy and/or reliability of the measure.*

- 5.4.28 **CaSL recommendation 1.** We recommend the use of a single source of data will improve the data accuracy and reliability of the output findings. It will also ensure TOC data is a true reflection of the events that took place.

*Observations relating to the spreading of best practice and/or improvements to the process.*

- 5.4.29 We have no observations for this measure.

## Progress on Outstanding Recommendations from Previous Audit Reports

There are no outstanding recommendations for this measure.

## 6 Audit report and commentary – Network capability



## 6.1 Linespeed capability (C1)

### Audit scope

- 6.1.1 This audit was undertaken to assess the reliability and accuracy of data and commentary which is reported in Network Rail's Annual Return 2009, Section 2, Linespeed capability (C1) section, including Tables 2.1 – 2.4.
- 6.1.2 The measure reports the length of running track in kilometres in the following speed bands:
- (a) Up to 35 miles per hour;
  - (b) 40-75 miles per hour;
  - (c) 80-105 miles per hour;
  - (d) 110-125 miles per hour;
  - (e) Over 125 miles per hour.
- 6.1.3 The definition and procedures for this measure are documented in NR/ARM/C1DF (issue 5) and NR/ARM/C1PR (issue 5).
- 6.1.4 The audit was undertaken at Network Rail headquarters and with the Positioning systems and Traffic team in York.

### Commentary on reported data

#### *Regulatory target*

- 6.1.5 The regulatory target for network capability, set in ORR's Access Charges Review 2003, is for no reduction in the capability of any route for broadly existing use from April 2001 levels. In April 2001 the network consisted of 30,846km of track, of which 3,603km were in speed band <35mph, 17,214km were in speed band 40-75mph, 7,476km were in speed band 10-105mph, 2,553km were in speed band 110-125mph, and 0km were in speed band 125+mph.

#### *Trend*

- 6.1.6 Figure 6.1.1 shows the reported linespeed capability, in kilometres, for each speed band, in miles per hour.

Speed band	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	Variance
<35	5,570	4,163	3,821	3,787	3,783	3,763	-0.5%
40-75	16,585	16,927	16,895	16,856	16,890	16,836	-0.3%
80-105	6,994	7,650	7,482	7,488	7,450	7,478	0.4%
110-125	2,415	2,741	2,907	2,932	2,959	3,042	2.8%
125+	-	-	-	-	0	0	
<b>Total</b>	<b>31,564</b>	<b>31,482</b>	<b>31,105</b>	<b>31,063</b>	<b>31,082</b>	<b>31,119</b>	<b>0.1%</b>

**Figure 6.1.1 Linespeed capability (speed band in mph, capability per annum reported in km) (C1)**

- 6.1.7 The net change in reported total kilometres of track compared with last year is an increase of 0.1%. This was due to data cleansing in GEOGIS which has been undertaken.

## Audit Findings

### *Process*

- 6.1.8 The process of reporting the network capability measures has not changed from the 2006/07 reporting year, though this year we did visit 2 Territories to review the processes by which they collated linespeed change data. Linespeed data in GEOGIS is updated regularly by the Infrastructure Investment, maintenance and engineering organisations. Permanent changes in linespeeds, as recorded in the Weekly Operating Notices (WONs) and the Periodic Operating Notices (PONs), are updated in GEOGIS by the Positioning systems and track team in York and Glasgow. GEOGIS is interrogated annually by Network Rail Headquarters to produce the data reported in the Annual Return.

### *Accuracy of the reported data*

- 6.1.9 We undertook the following sampling activities:
- (a) Visits were made to the Positioning systems and Traffic team in York. A sample of the linespeed changes during the year were checked against the relevant WONs and were found to have been accurately captured. The Positioning systems and Traffic team uses a spreadsheet showing linespeed changes made during the year and entered into GEOGIS. This includes the WON number, date, location of change, whether or not this has resulted in a change in speed band, and the name of the person who made the changes in GEOGIS. As Positioning Systems and Traffic are responsible for entering the data network wide, this method is now the standard format for recording linespeed changes across the network.
  - (b) At Headquarters, a sample of linespeeds for various locations was selected from Sectional Appendices. These linespeeds were then checked against the GEOGIS records and found to be correctly reported in the database.
  - (c) A sample of the changes to linespeeds was selected from the Annual Return. These linespeeds were checked and found to be accurately reflected in GEOGIS.
  - (d) The total track kilometres generated from GEOGIS was equal to the total track kilometres shown in the Annual Return.

## Assessment of confidence grade

- 6.1.10 **Reliability grade.** The definition for this measure is clearly documented. A reasonably well documented process has been followed to collect and report this measure. We believe measure C1 should have a reliability grade of B.
- 6.1.11 **Accuracy grade.** There is marginal yearly variation in the reported total track kilometres, which is almost entirely due to data cleansing. However we note that the process for updating linespeed changes in GEOGIS is now consistently applied across the network by the Positioning systems and Traffic team. We believe C1 should have an accuracy grade of 2.

## Audit Statement

- 6.1.12 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2009 for linespeed capability (C1), i.e. the length of running track in kilometres in various speed bands. We can confirm the data has been collected and reported in accordance with the relevant definition and procedure. The data has been assessed as having a confidence grade of B2.

## Recommendations arising

### *Recommendations essential for the accuracy and/or reliability of the measure*

- 6.1.13 We have no recommendations for this measure.

*Observations relating to spreading of best practice and/or improvements to process*

6.1.14 **C1 Observation 1.** We are pleased to note that Network Rail have taken our previous recommendation on board and now has a uniform and centralised system in place to record linespeed changes and update the information in GEOGIS.

**Progress on outstanding recommendations from previous audit reports**

6.1.15 We set out below our assessment on the current progress of Network Rail in addressing our outstanding recommendations for linespeed capability (C1) from our previous Audits:

Recommendations made	Progress update
<p><b>2008-R2:</b> We recommend that Headquarters' Champion works with the Engineering Knowledge Managers to develop a robust system for recording linespeed changes made in GEOGIS. We observed that South East Territory had put in a very good system in place and this should be followed by other managers.</p>	<p>The network wide recording of changes in linespeed capabilities by the Positioning systems and Traffic team has created a uniform and robust system for recording changes in GEOGIS. We feel this closes the recommendation.  <b>Current Status – Verified &amp; closed</b></p>
<p><b>2008-R1:</b> We recommend that the data tables in the Annual Return are presented in consistent units – presenting speed bands in miles per hour, speed band data in kilometres and linespeed increase/decreases in miles and yards is not easy for the reader.</p>	<p><b>Current Status – In progress</b></p>

**Figure 6.1.2 Progress on outstanding recommendations Linespeed capability (C1)**

## 6.2 Gauge capability (C2)

### Audit scope

- 6.2.1 This audit was undertaken to assess the reliability and accuracy of data and commentary which is reported in Network Rail's Annual Return 2009, Gauge capability (C2), including Tables 2.5 – 2.6.
- 6.2.2 The measure reports the length of route in kilometres capable of accepting different freight vehicle types and loads by reference to size (gauge). This measurement is reported against the following five gauge bands:
- (a) W6: (h)3338mm – (w)2600mm;
  - (b) W7: (h)3531mm – (w)2438mm;
  - (c) W8: (h)3618mm – (w)2600mm;
  - (d) W9: (h)3695mm – (w)2600mm;
  - (e) W10: (h)3900mm – (w)2500mm.
- 6.2.3 The definition and procedures for this measure are documented in NR/ARM/C2DF (issue 5) and NR/ARM/C2PR (issue 5) plus Railway Group Guidance Note GE/GN8573 (October 2004) 'Guidance on Gauging' Appendices 1 to 5.
- 6.2.4 The audit was undertaken at Network Rail Headquarters and the Geometry & Gauging National Specialist Team (NST) in York.

### Commentary on reported data

#### Regulatory target

- 6.2.5 The regulatory target for network capability, set in ORR's Access Charges Review 2003, is for no reduction in the capability of any route for broadly existing use from April 2001 levels.
- 6.2.6 In 2001 the Annual Return data was not reported on a comparable basis, hence it is not confirmable as to whether or not the regulatory target would have been met.

#### Trend

- 6.2.7 Figure 6.2.1 shows there to be no reported net change in the total kilometres of route, compared with last year.

Gauge	2004/05	2005/06	2006/07	2007/08	2008/09	Variance
W6	4,955	4,771	4,746	4,669	5,050	8.2%
W6 & W7	2,794	2,741	2,720	2,829	3,163	11.8%
W8	5,648	5,504	5,496	5,408	4,852	-10.3%
W9	1,714	1,615	1,618	1,698	1,382	-18.6%
W10 & W6	6	6	6	6	6	0.0%
W10 & W8	60	73	65	65	62	-4.6%
W10 & W9	939	1,100	1,138	1,139	1,299	14.0%
<b>Total</b>	<b>16,116</b>	<b>15,810</b>	<b>15,789</b>	<b>15,814</b>	<b>15,814</b>	<b>0.0%</b>

Figure 6.2.1 Gauge capability (kilometres) (C2)

- 6.2.8 These individual gauge variances have been caused by either:

- (a) Data cleansing activity;
- (b) Physical changes to the network leading to alterations in the loading gauge;
- (c) New lines.

6.2.9 Figure 6.2.1 shows that the gauge capability data quality was poor at the start of the year, but this has been improved with the data cleansing exercise being undertaken. Hence while the total kilometre has remained the same, there have been large changes between individual gauge bands.

## Audit Findings

### *Process*

- 6.2.10 The process of reporting the network capability measures has not changed from the 2008/09 reporting year. Authorised changes to the gauge are recorded by the National Engineering Reporting team in the Capabilities Database. Changes to the freight loading gauge on the network are authorised by the Senior Gauging Engineer using Certificates of Gauging Authority. The National Engineering Reporting team uses a lookup query to identify the total track length for each RA band from GEOGIS.
- 6.2.11 We visited the Gauging NST in York to understand the process by which changes to the gauge are authorised and recorded in the National Gauging Database. Prior to 2007/08, gauge capability information was only recorded in a spreadsheet. However in early 2007/08 this was changed to a database. The database now contains gauge capability information of the entire network. Gauging engineers have rights to change and update values in the database, while other stakeholders have read-only access. Network Rail is in the process of reviewing and updating the capability information in the database, which includes 'aspirational' gauge capability for each ELR. We were given a detailed overview of the database and its functionalities.
- 6.2.12 Network Rail are currently undertaking an Infrastructure Capability Project (of which gauge capability forms a part) to ensure that the capability of the network is accurately published. The Sectional Appendix (SA) is the primary document where gauge capability information should be published, but not all Route Sectional Appendices contain this information. By the end of 2009 Network Rail intends to publish gauge capability information in all SAs.
- 6.2.13 We obtained a sample historical Certificates of Gauging Authority as well as a sample of Certificates of Gauging Authority issued during 2008/09.

### *Accuracy of the reported data*

- 6.2.14 We undertook the following sampling activities:
- (a) A sample of Certificates of Gauging Authority provided to us by the Gauging NST pertained to changes in the loading gauge in 2008/09. A check confirmed that these changes were correctly recorded in the Capabilities Database and in GEOGIS.
  - (b) A sample of loading gauges for various ELRs were taken from the historical Certificates of Gauging Authority obtained by us. A check confirmed that these changes were correctly recorded in the Capabilities Database and in GEOGIS.
  - (c) For a sample of ELRs we checked the loading gauge given in the Sectional Appendix against those given in the Capabilities Database and GEOGIS, and these were found to be correct.

**Assessment of confidence grade**

- 6.2.15 **Reliability grade.** The definition for this measure is clearly documented. A reasonably well documented process has been followed to collect and report this measure. We believe that measure C2 should have a reliability grade of B.
- 6.2.16 **Accuracy grade.** Our sampling found no errors in changes to gauge made in 2008/09, or to a sample of ELRs. We believe that measure C2 should have an accuracy grade of 2.

**Audit Statement**

- 6.2.17 We have audited the reliability and accuracy of data and commentary presented in Network Rail’s Annual Return 2009 for gauge capability (C2), i.e. length of route in kilometres in various gauge bands. We can confirm the data has been collected and reported in accordance with the relevant definition and procedure. The data has been assessed as having a confidence grade of B2.

**Recommendations arising**

*Recommendations essential for the accuracy and/or reliability of the measure*

- 6.2.18 We have no recommendations for this measure

*Observations relating to spreading of best practice and/or improvements to process*

- 6.2.19 We have no observations for this measure.

**Progress on outstanding recommendations from previous audit reports**

- 6.2.20 We set out below our assessment on the current progress of Network Rail in addressing our outstanding recommendations for gauge capability (C2) from our previous Audits:

<b>Recommendations made</b>	<b>Progress update</b>
<p><b>2007-R09:</b> We recommend that Network Rail undertakes a thorough data cleaning exercise of the Capabilities Database to ensure that the gauge given for all sections of the network reflect those that are in the National Gauging Database and all Certificates of Gauging Authority issued.</p>	<p>Network Rail are developing the Gauge Capabilities which will ensure more robust gauge information as well as containing links to the relevant certificates. <b>Current Status – Repeated in Later year</b></p>

**Figure 6.2.2 Progress on outstanding recommendations for gauge capability (C2)**

## 6.3 Route availability value (C3)

### Audit scope

6.3.1 This audit was undertaken to assess the reliability and accuracy of data and commentary which is reported in Network Rail's Annual Return 2009, Section 2, Route availability value (C3), including Tables 2.7 – 2.8.

The measure reports the length of track in kilometres capable of accepting differently loaded vehicle types by reference to the structures Route Availability (RA), reported in three RA bands:

- (a) RA 1-6: up to 20.3 tonne axle load;
- (b) RA 7-9: up to 24.1 tonne axle load;
- (c) RA 10: up to 25.4 tonne axle load.

6.3.2 The definition and procedures for this measure are documented in NR/ARM/C3DF (issue 5) and NR/ARM/C3PR (issue 5).

6.3.3 The audit was undertaken at Network Rail Headquarters.

### Commentary on reported data

#### Regulatory target

6.3.4 The regulatory target for network capability, set in ORR's Access Charges Review 2003, is for no reduction in the capability of any route for broadly existing use from April 2001 levels.

#### Trend

6.3.5 Figure 6.3.1 shows the reported net change in the total kilometres of track for three RA bands. Track in RA1-6 has decreased by 10.8%; track in RA7-9 has increased by 2.1% and RA10 has reduced by 3.0%.

RA Band	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	Variance
RA 1-6	2,375	2,529	2,309	2,296	3,991	3,558	-10.8%
RA 7-9	26,297	26,319	25,935	25,928	25,060	25,591	2.1%
RA 10	2,585	2,634	2,861	2,839	2,031	1,970	-3.0%
<b>Total</b>	<b>31,257</b>	<b>31,482</b>	<b>31,105</b>	<b>31,063</b>	<b>31,082</b>	<b>31,119</b>	<b>0.1%</b>

Figure 6.3.1 Structures route availability (C3)

### Audit Findings

#### Process

6.3.6 The process of reporting the network capability measures has not changed from the 2007/08 reporting year. Authorised changes to the RA are recorded by the National Engineering Reporting team in the Capabilities Database, on the advice of Territory Structure Assessments Engineers. The National Engineering Reporting team uses a lookup query to identify the total track length for each RA band from GEOGIS. Further, Network Rail recently completed a Route Availability Verification Project. A list of ELRs, where RA values have been checked (referred to as 'verified RA') as part of this project, was provided to Halcrow.

### *Accuracy of Reported Data*

- 6.3.7 We undertook the following sampling activities:
- (a) For a sample of the routes, Engineering Line References (ELRs), the 'verified RA' was checked against the values in the Capabilities Database. We found one error where RA values were recorded in the Capabilities Database did not match that in GEOGIS.
  - (b) A sample of route availabilities was selected from the Sectional Appendices. These were found to be correctly recorded in the Capabilities Database and in GEOGIS.

### **Assessment of confidence grade**

- 6.3.8 **Reliability grade.** The definition for this measure is clearly documented. A reasonably well documented process has been followed to collect and report this measure. We believe that measure C3 should have a reliability grade of B.
- 6.3.9 **Accuracy grade.** Our sampling found one error in the difference between what is reported in GEOGIS and what is reported in the capabilities database. We believe that measure C3 should have an accuracy grade of 2.

### **Audit Statement**

- 6.3.10 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2009 for route availability value (C3), i.e. length of track in kilometres capable of accepting different loaded vehicle types by reference to structures route availability. We can confirm the data has been collected and reported in accordance with the relevant definition and procedure. Our C1 audit found the net variation due to cleansing on the total network kilometres was 0.1%. The data has been assessed as having a confidence grade of B2.

### **Recommendations arising**

#### *Recommendations essential for the accuracy and/or reliability of the measure*

- 6.3.11 We have no recommendations for this measure.

#### *Observations relating to spreading of best practice and/or improvements to process*

- 6.3.12 We have no observations for this measure.

### **Progress on outstanding recommendations from previous audit reports**

- 6.3.13 There are no outstanding recommendations for this measure.

## 6.4 Electrified track capability (C4)

### Audit scope

- 6.4.1 This audit was undertaken to assess the reliability and accuracy of data and commentary which is reported in Network Rail's Annual Return 2009, Section 2, Electrified track capability (C4), including Tables 2.9 – 2.10.
- 6.4.2 This measure reports the length of electrified track in kilometres for:
- 25 kV a.c overhead;
  - 650/750 V d.c 3rd rail;
  - Dual a.c overhead & d.c 3rd rail;
  - 1500V d.c overhead.
- 6.4.3 The definition and procedures for this measure are documented in NR/ARM/C4DF (issue 5) and NR/ARM/C4PR (issue 5).
- 6.4.4 The audit was undertaken at Network Rail Headquarters and Waterloo General Offices.

### Commentary on reported data

#### Regulatory target

- 6.4.5 The regulatory target for network capability, set in ORR's Access Charges Review 2003, is for no reduction in the capability of any route for broadly existing use from April 2001 levels.
- 6.4.6 In April 2001 there were 7,578km of 25 kV a.c overhead electrified track and 4,285km of 650/750 d.c 3<sup>rd</sup> rail electrified track, giving a total of 11,863km of electrified track.

#### Trend

- 6.4.7 Figure 6.4.1 shows the reported net change in the total kilometres of electrified track.

Electrification	2004/05	2005/06	2006/07	2007/08	2008/09	Variance
25 kV a.c overhead	7,748	7,882	7,980	7,974	8,000	0.3%
650/750 V d.c 3rd rail	4,497	4,493	4,484	4,481	4,481	0.0%
Dual a.c OHL & d.c 3rd rail	35	39	38	40	40	0.0%
1500V d.c overhead	39	39	39	39	39	0.0%
<b>Electrified</b>	<b>12,319</b>	<b>12,453</b>	<b>12,541</b>	<b>12,534</b>	<b>12,560</b>	<b>0.2%</b>

Figure 6.4.1 Electrification capability (C4)

### Audit Findings

#### Process

- 6.4.8 The process of reporting the network capability measures has not changed from the 2007/08 reporting year. Electrification capability is updated in GEOGIS by the National Engineering Reporting team as and when new electrified lines are incorporated into the network.

6.4.9 A new team (called the Data Management Team) has been set up with a network-wide remit to look specifically at data quality. The team analyse data on a period-by-period basis and raise any queries, errors or anomalies with the Routes through the data quality report.

*Accuracy of reported data*

- 6.4.10 We undertook the following sampling activities:
- (a) A sample of electrified and non-electrified lines was selected from the Sectional Appendices. These were checked against the GEOGIS records. All were found to be correctly reported in the database.
  - (b) A sample of the ‘additions’ and ‘removals’ of electrified track during 2008/09 were selected and it was found that they were all correctly reflected in GEOGIS.

**Assessment of confidence grade**

- 6.4.11 **Reliability grade.** The definition for this measure is clearly documented. A reasonably well documented process has been followed to collect and report this measure. We believe that measure C4 should have a reliability grade of B.
- 6.4.12 **Accuracy grade.** We believe that C4 should have an accuracy grade of 2.

**Audit Statement**

6.4.13 We have audited the reliability and accuracy of data and commentary presented in Network Rail’s Annual Return 2009 for electrified track capability (C4), i.e. length of track in kilometres in various electrification bands. We can confirm the data has been collected and reported in accordance with the relevant definition and procedure. The data has been assessed as having a confidence grade of B2.

**Recommendations arising**

*Recommendations essential for the accuracy and/or reliability of the measure*

6.4.14 We have no recommendations for this measure.

*Observations relating to spreading of best practice and/or improvements to process*

6.4.15 **C4 Observation 1** We believe the creation of the new Data Quality Team is a positive improvement to this process of data collection and reporting.

**Progress on outstanding recommendations from previous audit reports**

6.4.16 We set out below our assessment on the current progress of Network Rail in addressing our outstanding recommendations for electrified track capability (C4) from our previous Audits:

<b>Recommendations made</b>	<b>Progress update</b>
<b>2008-R15</b> We recommend that territories adopt more robust procedures to ensure that when errors have been pointed out, GEOGIS records are updated in a more timely and regular manner.	A specialist data management team has been set up with a network-wide remit. <b>Current Status – Actioned &amp; Verified</b>
<b>2006-R14:</b> We recommend that the GEOGIS database be checked to ensure that electrification classifications are correctly recorded.	Audit of the last two years have shown no more significant errors in classifications <b>Current Status – Actioned &amp; Verified</b>

**Figure 6.4.2 Progress on outstanding recommendations for electrified track capability (C4)**

## 6.5 Mileage

### Audit scope

- 6.5.1 This audit was undertaken to assess the reliability and accuracy of data and commentary which is reported in Network Rail's Annual Return 2009, Section 2, Mileage, including Tables 2.11 – 2.12.
- 6.5.2 This measure reports the following:
- (a) The number of miles travelled by (i) franchised passenger trains and (ii) open access passenger trains; empty coaching stock is excluded;
  - (b) Freight train mileage defined as the number of miles travelled by freight trains.
- 6.5.3 There is no formal definition or procedure for this measure.
- 6.5.4 The audits were undertaken at Network Rail Headquarters.

### Commentary on reported data

#### Regulatory target

- 6.5.5 The regulatory target for network capability, set in ORR's Access Charges Review 2003, is for no reduction in the capability of any route for broadly existing use from April 2001 levels.

#### Trend

- 6.5.6 Figure 6.5.1 shows total passenger train miles (excluding open access) have increased by 2.7% between 2007/08 and 2008/09, whilst the freight miles decreased by 10.8% during the same period.

Measure	2004/05	2005/06	2006/07	2007/08	2008/09	Variance
Passenger train mileage (franchised)	262.9	267.8	268.8	270.8	278.2	2.7%
Passenger train mileage (open access)	3.5	4.1	4.1	4.2	4.7	11.9%
Freight train mileage	27.9	31.0	29.9	27.8	24.8	-10.8%
<b>Total Mileage</b>	<b>294.3</b>	<b>302.9</b>	<b>302.8</b>	<b>302.8</b>	<b>307.7</b>	<b>1.6%</b>

Figure 6.5.1 Train Mileages (million miles; empty coaching stock excluded)

## Audit Findings

### Process

#### Passenger Miles

- 6.5.7 Passenger train miles data is compiled at Network Rail Headquarters from PALADIN, the computerised system for recording train performance data. It extracts train mileage (for both passengers and freight) from TRUST, by operators, on a period-by-period basis. At the end of each period, the PALADIN queries are run for 83 different operators (including freight operators) who use Network Rail infrastructure.
- 6.5.8 The data from PALADIN gets extracted into the Train Mile database, as .txt files. These files are however in machine code and cannot be used for data analysis. Hence the PUMPS software package is used to convert the .txt files into Excel format. A summary spreadsheet summarises the train miles data by operator on a period-by-period basis.

- 6.5.9 The Performance Reporting team is trialling a new process which would use PSS (Performance System Strategy) to replace PALADIN. This would negate the need for further spreadsheets to process data extracted from PALADIN. It is the Performance Reporting team's intention to run both systems until the accuracy of PSS is assured and is aligned with data extracted from PALADIN.

#### Freight Miles

- 6.5.10 The freight train mileage is compiled at Network Rail Headquarters from the Billing Infrastructure Freight System (BIFS). BIFS is a centrally managed computerised system that invoices freight train operators, based on information generated by train reporting systems (i.e. the TOPS system). BIFS came offline in April 2009 and has been replaced by the new Track Access Billing System (TABS).
- 6.5.11 Network Rail has developed an Access database query to extract the freight mileage data from BIFS. The query is run at the end of every period and entered into a spreadsheet, which summarises the data at the end of the year. Data is aggregated by freight operator and by commodity. This query was run in April before the BIFS system went offline.

#### *Accuracy of reported data*

#### Passenger Miles

- 6.5.12 The query used to extract the data from PALADIN was checked and found to be functioning properly. The summary spreadsheet used to compile the data was also checked and found to be accurate.
- 6.5.13 A sample of train miles (for both franchised and open access operators) from the summary spreadsheet was checked against the figures reported in the Annual Return. All were found to be correct.
- 6.5.14 During 2008/09 the following changes were made to the operators; Gatwick Express Services were incorporated into Southern, there were changes to some service codes, there were a few new open access operators, e.g. Wrexham-Shropshire.
- 6.5.15 The query excludes empty trains, specifically Class 0 (Light Engine), 3 (Mixed engines) & 5 (Empty coach and stock). The reported data is therefore understated by a small (unquantified) amount.

#### Freight Miles

- 6.5.16 The query used to extract train miles data from BIFS was checked and found to be reasonable. The summary spreadsheet was also checked and found to be accurate.
- 6.5.17 We understand that the BIFS data includes all freight services for billing purposes. This will include light locomotives and infrastructure trains which are excluded from the train mileage from PPS (i.e. used for performance monitoring).

#### Assessment of confidence grade

- 6.5.18 **Passenger Train Miles Reliability grade.** The definition and procedure for this measure is not documented. A consistent process has been followed to collect and report this measure, using industry standard sources of data. We believe that Passenger Train Miles should have a reliability grade of B.
- 6.5.19 **Passenger Train Miles Accuracy grade.** We found uncertainties in the data arising from inclusion of Chiltern Railways services running on LUL infrastructure. Despite that, we believe that Passenger Train Miles should have an accuracy grade of 2
- 6.5.20 **Freight Train Miles Reliability grade.** The definition and procedure for this measure is not documented. A consistent process has been followed to collect and report this measure, using industry standard sources of data. We believe that Freight Train Miles should have a reliability grade of B.
- 6.5.21 **Freight Train Miles Accuracy grade.** We believe that Freight Miles should have an accuracy grade of 2.

## Audit Statement

- 6.5.22 **Passenger Train Miles.** We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2009 for Mileage. Our audit found one source of error in the results. The data has been assessed as having a confidence grade of B2.
- 6.5.23 **Freight Train Miles.** We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2009 for Mileage. The data has been assessed as having a confidence grade of B2.

## Recommendations arising

### *Recommendations essential for the accuracy and/or reliability of the measure*

- 6.5.24 We have no recommendations for this measure.

### *Observations relating to spreading of best practice and/or improvements to process*

- 6.5.25 We have no observations for this measure.

## Progress on outstanding recommendations from previous audit reports

- 6.5.26 We set out below our assessment on the current progress of Network Rail in addressing our outstanding recommendations for Mileage from our previous Audits:

Recommendations made	Progress update
<b>2007-R10:</b> We recommend that Chiltern Railways running on LUL infrastructure be excluded from the figure reported.	When NR completes its migration from PALADIN to PSS as a source data system, which is more flexible and transparent, it will be able to provide evidence that Chiltern miles on LUL infrastructure are being excluded from the passenger mileage totals. It is hoped this will occur during the course of the 2009/10 financial year. <b>Current Status – In Progress</b>
<b>2007-R11:</b> We recommend that Network Rail rationalises the significant differences between data extracted from BIFS by the Performance Reporting Analyst and the Freight Billing Team.	For performance purposes, NR uses PSS to calculate freight mileages and not BIFS, which is used by the Freight Billing team. After investigation during the course of this year, it was found that the definitions of what is included in the PSS and BIFS data are subtly different because of the different intended purposes for the data. There was no evidence that any difference was due to inaccurate data. <b>Current Status – In Progress</b>
<b>2007-R13:</b> We recommend that a Network Rail adopt a formal procedure for reporting this measure.	NR has fully documented internal processes for extracting mileage data from PALADIN. However, with the intended migration from PALADIN to PSS for passenger mileages, NR will investigate the possibility of documenting a formal 'definition' of what is being measured in the newer system. Timescales for this will be dependent upon timescales for the change in source data system. <b>Current Status – In Progress</b>

Figure 6.5.2 Progress on outstanding recommendations for Mileage

## 6.6 Freight Gross Tonne Miles

### Audit scope

- 6.6.1 This audit was undertaken to assess the reliability and accuracy of data and commentary which is reported in Network Rail's Annual Return 2009, Section 2, Freight Gross Tonne Miles, including Table 2.13.
- 6.6.2 This measure reports the mileage for each freight locomotive, wagon or coaching stock multiplied by the weight of the relevant vehicle.
- 6.6.3 There is no formal definition or procedure for this measure.
- 6.6.4 The audits were undertaken at Network Rail Headquarters.

### Commentary on reported data

#### Regulatory target

- 6.6.5 The regulatory target for network capability, set in ORR's Access Charges Review 2003, is for no reduction in the capability of any route for broadly existing use from April 2001 levels.

#### Trend

- 6.6.6 Figure 6.6.1 shows freight gross tonne miles (GTM) have decreased by 0.8% between 2007/08 and 2008/09.

Measure	2004/05	2005/06	2006/07	2007/08	2008/09	Variance
Million Gross Tonne Miles	28,392	30,305	30,252	28,650	28,439	-0.8%

Figure 6.6.1 Freight Gross Tonne Miles

### Audit Findings

#### Process

- 6.6.7 GTM data is compiled at Network Rail Headquarters, derived from the Billing Infrastructure Freight System (BIFS). BIFS is a centrally managed computerised system that invoices freight train operators, based on information generated by train reporting systems (i.e. the TOPS system).
- 6.6.8 Network Rail has developed an Access database query to extract the freight GTM data from BIFS. The actual miles are multiplied by the gross weight to get gross tonne miles. The query is run at the end of every period and entered into a spreadsheet, which summarised the data at the end of the year. Data is extracted by freight operator and by commodity.
- 6.6.9 This is the last year BIFS will be used to gather and report GTM data. The BIFS system went offline in April 2009, and has been replaced by the Track Access Billing System (TABS).

#### Accuracy of reported data

- 6.6.10 The query used to extract GTM data from BIFS was checked and found to be reasonable. The summary spreadsheet was also checked and found to be accurate.
- 6.6.11 The data reported is a sum of the period-by-period train miles extracted from BIFS.

**Assessment of confidence grade**

- 6.6.12 **Reliability grade:** The definition and procedure for this measure is not documented. A consistent process has been followed to collect and report this measure, using industry standard sources of data. We believe Freight Gross Train Miles should have a reliability grade of B.
- 6.6.13 **Accuracy grade:** We believe Freight Gross Train Miles should have an accuracy grade of 2.

**Audit Statement**

- 6.6.14 We have audited the reliability and accuracy of data and commentary presented in Network Rail’s Annual Return 2009 for freight gross tonne miles. We can confirm the data has been collected and reported in accordance with the relevant definition. The data has been assessed as having a confidence grade of B2.

**Recommendations arising**

*Recommendations essential for the accuracy and/or reliability of the measure*

- 6.6.15 We have no recommendations for this measure.

*Observations relating to spreading of best practice and/or improvements to process*

- 6.6.16 We have no observations for this measure.

**Progress on outstanding recommendations from previous audit reports**

- 6.6.17 We set out below our assessment on the current progress of Network Rail in addressing our outstanding recommendations for Mileage from our previous Audits:

<b>Recommendations made</b>	<b>Progress update</b>
<b>2008-R1:</b> We recommend that a formal definition and procedure is documented for this procedure and included in the Asset Reporting Manual.	No action has been suggested to date. <b>Current Status – No Action or Timescale Identified</b>

**Figure 6.6.2 Progress on outstanding recommendations for Freight GTM**

## 6.7 Management of Late Disruptive Possessions

### Audit Scope

- 6.7.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2009, Section 2, Late Disruptive Possessions, including Table 2.14.
- 6.7.2 The measure reports on the number of Late Disruptive Possessions granted by Network Rail during 2008/9. A Late Disruptive Possession is defined as any restriction on the availability of the network that requires a TOC or FOC to bid for a short-term planned alteration to a weekly timetabled service or to an existing offered short-term planned service.
- 6.7.3 Procedures for management of possession planning are laid down in documents NR/M2/LTC/PL0056 Work and Possession Planning for the Railway Infrastructure (Meetings Management Pack) and NR/5P/MTC/0086 Work and Possession Planning for the Railway Infrastructure (Change Control)
- 6.7.4 Late Disruptive Possessions were first measured as a reportable in the Annual Return for 2007/8. At that time the measure was still being understood and further developments were expected for future years. This audit will therefore comment on any changes and developments that have taken place since the last report.
- 6.7.5 Audits were undertaken at Network Rail's offices in Leeds where the measure is calculated by the Possessions Systems Support team.

### Commentary on Reported Data

#### *Regulatory target*

- 6.7.6 There is no regulatory target for this measure.

#### *Trends*

- 6.7.7 The figures show that the overall number of Late Disruptive Possessions rose in 2008/9, following a downward trend on 2007/8. Five routes (Anglia, Midland & Continental, Scotland, Sussex and Western) show a downward trend. However, with the exception of Anglia Route this trend is only slightly downward and is based on a relatively low number of Late Disruptive Possessions recorded.
- 6.7.8 Upward trends are shown in London North-Eastern, London North-Western, Kent and Wessex. Both the London North Eastern and London North Western Routes' upward trends are against a background of higher overall level of Late Disruptive Possessions than experienced by other Routes. London North Western in particular has recorded a steep rise, which has helped skew the overall trend. However, it appears unlikely that excluding London North Western from the data would show a decisive downward trend for the rest of the network.

#### *Processes*

- 6.7.9 The basic process for managing and agreeing Late Disruptive Possessions has not changed, but there has been a renewed focus on minimising Late Disruptive Possessions before the need to go to TOC/FOC consultation. A Planning and regulation template has been drafted and has been seen by the audit team.
- 6.7.10 However, Network Rail has also detected problems in the data collection for 2007/8 and 2006/7, which relied on counting data changes and tended not to eliminate double counts when a possession generated more than one entry. This has been rectified this year and the reported figures can be regarded as more accurate. However, it does mean that the apparent downward movement from last year may not be genuine; in practice there is no way of knowing as while the 2008/9 data is more accurate it is not directly comparable to the two previous years' data.

- 6.7.11 Within the data for 2008/9 there appears to be an upward trend overall, with a slight downward trend only visible on the Western and Scotland routes. Given this the contribution of additional focus on minimising Late Disruptive Possessions may not be as great as might be hoped.
- 6.7.12 In reviewing the data some errors were found. These constituted a 4%-5% error rate, but in this case were able to be corrected before final publication.

## Audit Findings

### *Process*

- 6.7.13 The data source for this measure is the Possessions Planning System (PPS) and the origin data is entered by the Area Delivery Planning Teams. Data is extracted on a 4-weekly basis. Avoidance of double counting is achieved through the sign-off process, so that the number of Late Disruptive Possessions in PPS can be cross-checked against the numbers actually authorised.
- 6.7.14 The risk of double counting is partly due to the way that PPS, as a geographic model, will do multiple counts of possessions at route boundaries and at junctions. This can at the least lead to a double count, more at some junctions depending on layout and the area covered by the possession. There is also a risk that on occasions when possessions are cancelled and then reinstated there is a risk of double counting as there will be more than one record and reference for a single possession. Furthermore it is possible for possession related disruption to be incorrectly flagged and this also is checked for manually.
- 6.7.15 All changes are required to be notified and logged. Failure to do this will lead to TOCs and FOCs complaining and possibly seeking redress for possession related disruption that they were not notified of. This can lead to compensation payments by Network Rail to operators.
- 6.7.16 This process is estimated to capture 90% of Late Disruptive Possessions at an error rate of no more than 5%, and 10% at an error rate of 10%. This implies an aggregate error rate of approximately 5.5%.

### *Accuracy of Reported Data*

- 6.7.17 The additional checks have created greater confidence in the accuracy of the data reported for 2008/9.
- 6.7.18 The increase in Network Rail's confidence in their reported data means that trend data from year to year will not be reliable until the next reporting year.

## Assessment of Confidence Grade

- 6.7.19 **Reliability Grade.** We believe that the reported data for Management of Late Disruptive Possessions should have a reliability grade of B.
- 6.7.20 **Accuracy Grade.** We believe that the reported data for Management of Late Disruptive Possessions should have a reliability grade of 3.

## Audit Statement

- 6.7.21 We have audited the reliability and accuracy of data and commentary presented for Management of Late Disruptive Possessions in the Network Rail Annual Return for 2009. Network Rail has taken steps since the last Annual Return to improve the robustness of data collection and thus the accuracy of the information provided. These improvements do mean that trends are as yet hard to fully discern. The data has been assessed as having a confidence grade of B3.

## Recommendations Arising

*Recommendations essential for the accuracy and/or reliability of the measure.*

- 6.7.22 **Late Disruptive Possessions Recommendation 1.** It was noted by the audit team that this measure does not seek to normalise the number of LDPs against the level of possession activity. We recommend that the measure be changed and a representative normalising factor be agreed and adopted.
- 6.7.23 **Late Disruptive Possessions Recommendation 2.** Network Rail should work to retain the gains made in the route showing downwards or only slightly upward trends and concentrate on reducing overall levels and trends in Late Disruptive Possessions on the London North Western and London North Eastern Routes.
- 6.7.24 **Late Disruptive Possessions Recommendation 3.** Greater context in terms of trends might be provided if the overall number of possessions and/or the number of requests for Late Disruptive Possessions is also known. We therefore recommend that in future this measure be presented along with data on the overall level of possession activity.

*Observations relating to the spreading of best practice and/or improvements to the process.*

- 6.7.25 **Management of Late Disruptive Possessions Observation 1.** This year the reliability and accuracy of the data has been improved, but the difference between the data reported this year and that reported last year suggests that interpretation would be helped by showing the measure in context. It is therefore recommended that the data be presented along with information on the overall number of possessions and the number of requests for Late Disruptive Possessions. This would enable reported data and trends in Late Disruptive Possessions to be interpreted in the context of the levels and trends in requests and in overall possession numbers.

## Progress on Outstanding Recommendations from Previous Audit Reports

- 6.7.26 In the Independent Reporter's commentary on the Management of Late Disruptive Possessions in 2008 it was recommended that Network Rail consider increasing the sophistication of the measure, particularly in respect of measuring the impact of Late Disruptive Possessions, the length of notice period and the number of train plans amended. No actions are understood to have been taken on any of these points.

## **7 Audit report and commentary – Asset Management**



## 7.1 Number of broken rails (M1)

### Audit scope

- 7.1.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail’s Annual Return 20009, Section 3, Broken Rails (M1), including Table 3.1.
- 7.1.2 The measure reports the number of broken rails. A broken rail either has a fracture through the full cross section or has a piece broken from it exceeding 50mm in length.
- 7.1.3 The definition and procedures for this measure are documented in NR/ARM/M1DF (issue 3) and NR/ARM/M1PR (issue 5).
- 7.1.4 Audits were undertaken at Network Rail Headquarters and at five Delivery Units – York, Colchester, Paisley, Northampton, and Stoke Gifford.

### Commentary on reported data

#### Regulatory target

- 7.1.5 The regulatory target for broken rails set in ORR’s Access Charges Review 2003 is “no more than 300 broken rails per annum within two years”. We have interpreted this as meaning the number of broken rails reported for the period 2006/07 to 2008/09 should be no greater than 300 per annum.
- 7.1.6 164 broken rails were reported for 2008/09 which has met the target of 300. The reasons for the lower result this year have been attributed to a combination of improving rail management and testing processes.

#### Trends

- 7.1.7 Figure 7.1.1 shows the number of rail breaks for 2008/09 has continued the downward trend of this measure since 2000/01. The result for 2008/09 is a 9.4% improvement on 2007/08. The lower figure was attributed to better Ultrasonic Test Unit (UTU) testing frequencies, ongoing renewals and re-railing. The mild winter was also a contributing factor.

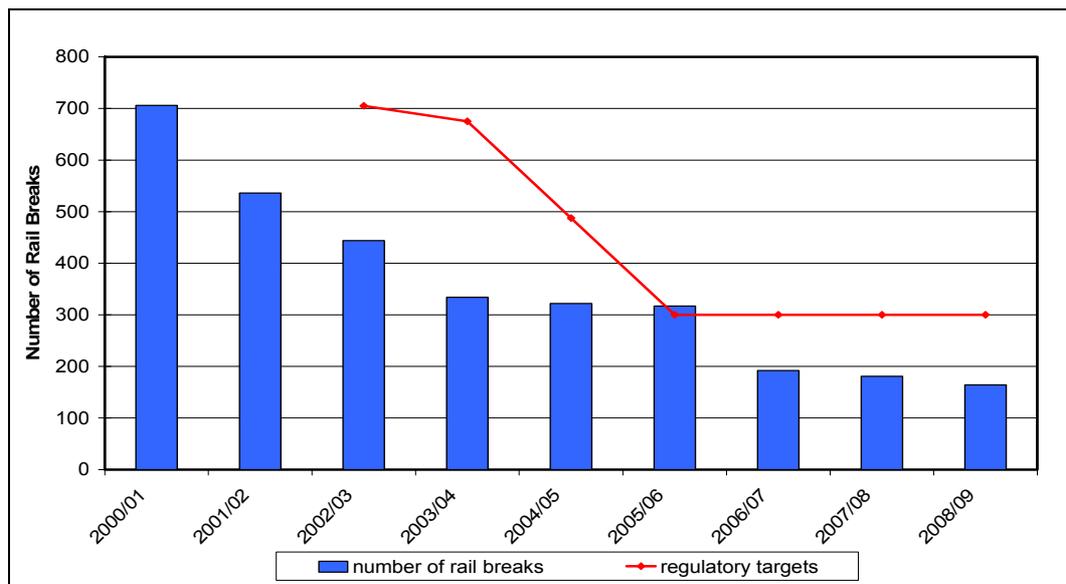


Figure 7.1.1 Number of broken rails (M1)

7.1.8 The number of broken rails by territory is shown below in Figure 7.1.2. The Route with the largest decrease in Rail Breaks in 2008/09 was London North East. Scotland, Sussex, Kent and Western Routes showed increases in the number of Rail Breaks in 2008/09.

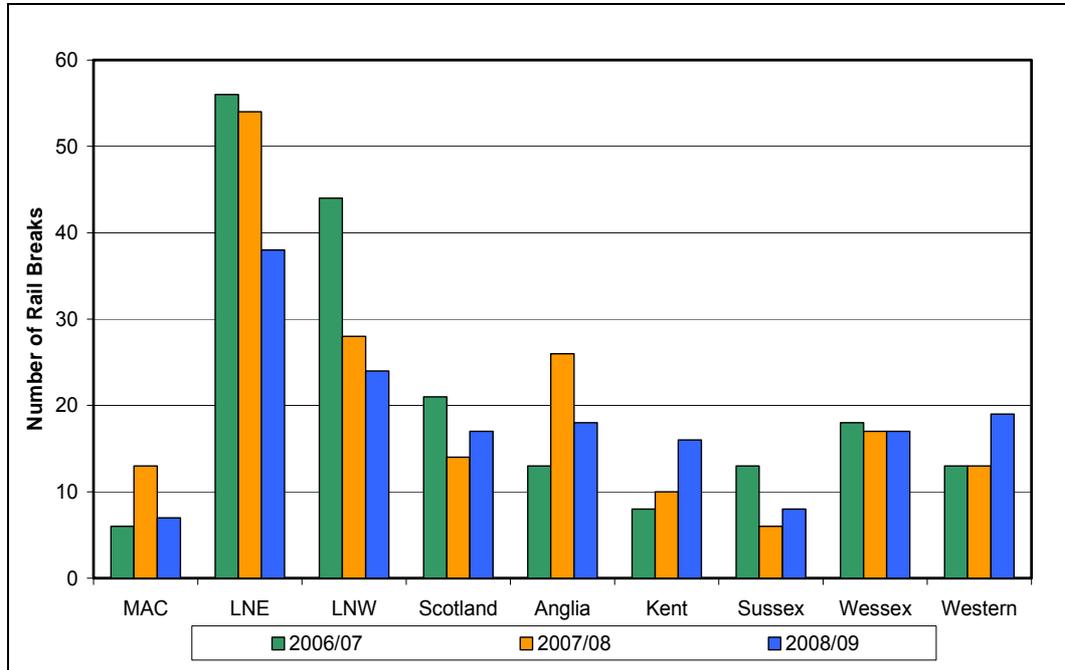


Figure 7.1.2 Number of broken rails by Territory (M1)

7.1.9 Engineers in the depots audited attributed the decrease in the number of rail breaks to improved Ultrasonic Test Unit (UTU) testing and compliance on the network, and the ongoing effect of renewals. The reasons for the increases were generally due to non-detectable corrosion, which may be attributable to rail pads not being replaced in a timely manner. Also, an increase in the tonnage and axle stiffness of new rolling stock in Kent, Sussex and Wessex may have been a contributing factor in the increases in the number of broken rails on these Routes.

7.1.10 The number of ‘detectable’ breaks is decreasing, as the UTU runs more frequently. The majority of breaks were due to rail foot corrosion, corrosion pitting and weld breaks, which are very difficult to pick up ultrasonically. This continues the trend from 2007/08.

7.1.11 In previous years Network Rail has provided us with Equated Track Miles (ETM) data which has enabled us to normalise the number of broken rails for each Route. We have been able to undertake this analysis as the ETM data was provided by Network Rail.

## Audit findings

### Process

7.1.12 Following Network Rail’s decision to shelve the Rail Defect Tracker (RDT) system, a new system, Rail Defects Management System (RDMS) was rolled out in October 2008. The introduction was timed to coincide with the re-structuring of Network Rail to a route based organisation.

7.1.13 Figure 7.1.3 describes the process by which broken rails identified on the network are recorded in the Rail Defects Management System (RDMS) and finally reported in the Annual Return.

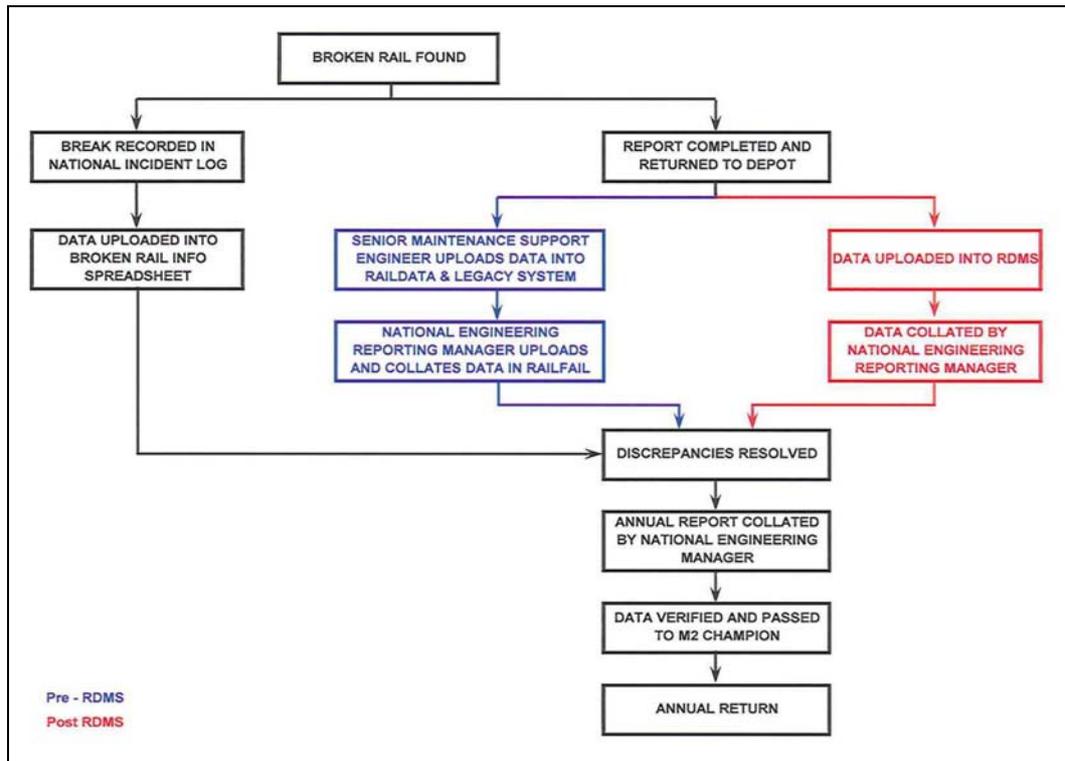


Figure 7.1.3 Process map of broken rail recording in RDMS

- 7.1.14 The rollout of RDMS has increased the efficiency of this process, as the National Engineering Reporting Team can use the data directly from RDMS, without the need for staff at the depots to send them periodic reports. It also gives the national champion oversight of the number of rail breaks and any trends which may arise.
- 7.1.15 While reviewing the new RDMS system, we found that input of data into the system was now being done at the depot level, by new staff who had not done this in the past. This had resulted in certain pieces of data not being inputted into RDMS, including rail manufacture dates. Though this data has no material impact on the number of broken rails, it is useful data and should be captured within RDMS for future analysis.

**Assessment of confidence grade**

- 7.1.16 **Reliability grade.** The definition for this measure is clearly documented. A documented process has been followed to collect and report this measure. The process is closely managed and the figures internally reported on a daily, four weekly and annual basis. We believe that M1 should have a reliability grade of A.
- 7.1.17 **Accuracy grade.** Two parallel systems are used to identify broken rails for this measure and a reconciliation process is used to increase accuracy. The process would have to misreport four broken rails or more in 2008/09 to have an inaccuracy of 1% or higher; our assessment is that the accuracy of this process would not allow this level of misreporting. We believe that M1 should have an accuracy grade of 1.

**Audit Statement**

- 7.1.18 We have audited the data and commentary presented in National Rail’s Annual Return 2009 for Number of Broken Rails (M1). We can confirm the data has been collected in accordance with the relevant definition and procedure. The data has been assessed as having a confidence grade of A1. The regulatory target for this measure has been met.

**Recommendations arising**

*Recommendations essential for the accuracy and/or reliability of the measure*

7.1.19 **Recommendation 1:** We recommend that new staff inputting the data into the RDMS system at depot level received training and guidance to ensure uniform inputs of all fields of data including year of rail manufacture.

*Observations relating to spreading of best practice and/or improvements to process*

7.1.20 We have no observations for this measure.

**Progress on outstanding recommendations from previous audit reports**

7.1.21 We set out below our assessment on the current progress of Network Rail in addressing our outstanding recommendations for Broken Rails (M1) from our previous Audits:

<b>Recommendations made</b>	<b>Progress update</b>
<p><b>2005-R11:</b> We recommend that the use of two parallel systems (Control Logs/ Broken Rail Information Sheet and Area Defect Databases/ RailData) for reporting the number of broken rails is reviewed.</p>	<p>Network Rail have advised that this will be addressed with the implementation of RDMS.  <b>Current Status – Actioned and verified</b></p>
<p><b>2007-R14:</b> We recognise that there has been some good practice in some of the Territories to carry out an analysis of rail break classifications to compare with previous years. We recommend that a retrospective network-wide analysis of the individual classifications of rail breaks is carried out. This will add significant value if year-on-year trends, geographical trends, or other trends which may be established. In our opinion, this is an essential part of Network Rail’s rail asset management process which is currently not being managed on a consistent network-wide basis.</p>	<p>Network Rail have advised that this functionality will be possible within RDMS.  <b>Current Status – In Progress</b></p>

**Figure 7.1.4 Progress on outstanding recommendations for Broken Rails (M1)**

## 7.2 Rail defects (M2)

### Audit scope

- 7.2.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2009, Section 3, Rail Defects (M2), including Tables 3.2 – 3.7.
- 7.2.2 The measure reports the number of rail defects. A defective rail is a rail which is not broken but has another fault requiring remedial action to make it fit for purpose in accordance with Network Rail standards. Rail defects are reported as either isolated defects or continuous defects.
- 7.2.3 The definition and procedures for this measure are documented in NR/ARM/M2DF (issue 4) and NR/ARM/M2PR (issue 5) respectively.
- 7.2.4 Audits were undertaken at Network Rail Headquarters and in 5 Delivery Units – York, Northampton, Paisley, Colchester and Stoke Gifford.

### Commentary on reported data

#### *Regulatory target*

- 7.2.5 There is no regulatory target for M2 rail defects.

#### *Trend*

- 7.2.6 In 2008/09, the number of isolated defects discovered was 20,388, which are 10.8% fewer defects than found in 2007/08. The length of continuous rail defects detected was 237,940 yards, a decrease of 30.0% yards of defects than found in 2007/08. Isolated and continuous defects have reduced due to better maintenance, re-railing and grinding.
- 7.2.7 For the last five years the reported data for rail defects from the previous year has been subsequently restated (corrected) in the Annual Return. The analysis that follows includes trends of both subsequently restated data and initially reported data, as the reported data for 2008/09 is (as yet) uncorrected.
- 7.2.8 **Isolated Rail Defects.** Figure 7.2.1 shows the number of isolated defects remaining, as reported in the Annual Return. The performance for 2008/09 shows 21.4% more defects than the initially reported figure for 2007/08 and 16.1% more defects than the subsequently restated figure for 2007/08.
- 7.2.9 **Continuous Rail Defects.** Figure 7.2.2 shows the length of continuous defects remaining, as reported in the Annual Return. The performance for 2008/09 shows a 30.4% decrease in defects than the initially reported figure for 2007/08 and 9.9% more defects than the subsequently restated figure.

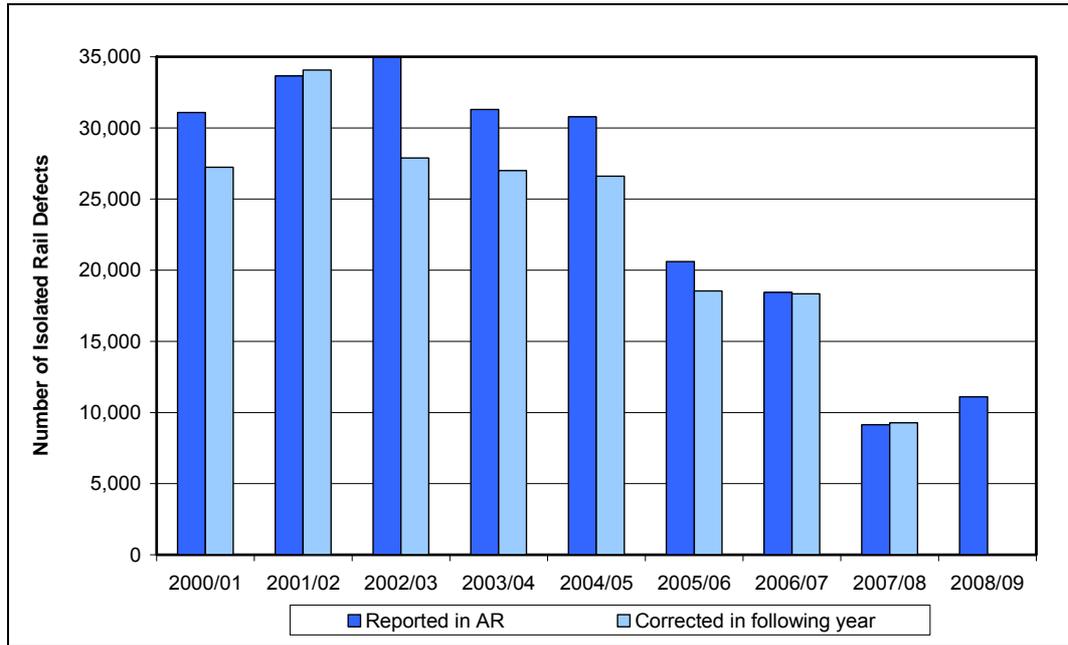


Figure 7.2.1 Numbers of isolated rail defects remaining (M2)

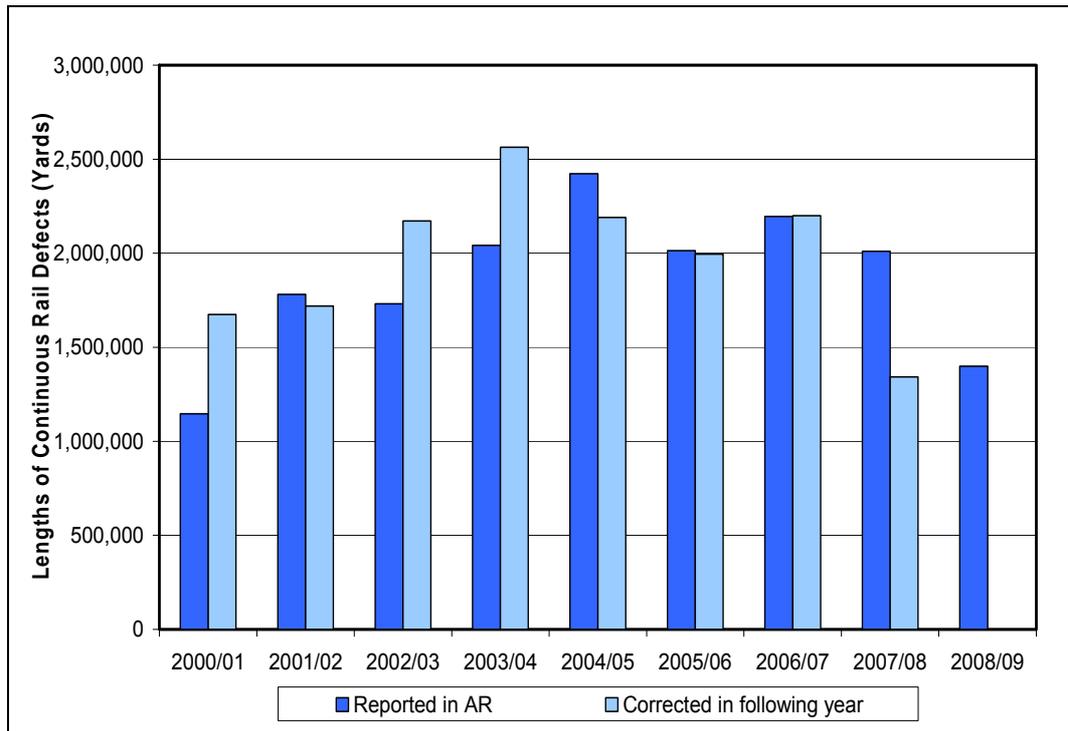


Figure 7.2.2 Length of continuous rail defects remaining (M2)

## Audit Findings

### Process

- 7.2.10 Data is collected for this measure through ultrasonic non-destructive and visual inspections. Network Rail are using the Ultrasonic Test Units (UTU's) to replace pedestrian testing on the main line routes (CAT 1A, 1, 2 and 3) in compliance with the standard testing frequencies. Additional pedestrian testing is then being used to target defects – such as wheelburns, vertical longitudinal splits, lipping – outside of the UTU field of testing.
- 7.2.11 Rail defects are recorded and reported through the Rail Defects Management System (RDMS) which was rolled out in October 2008. Figure 7.2.1 describes the process by which rail defects identified on the network are recorded in RDMS and finally reported in the Annual Return.

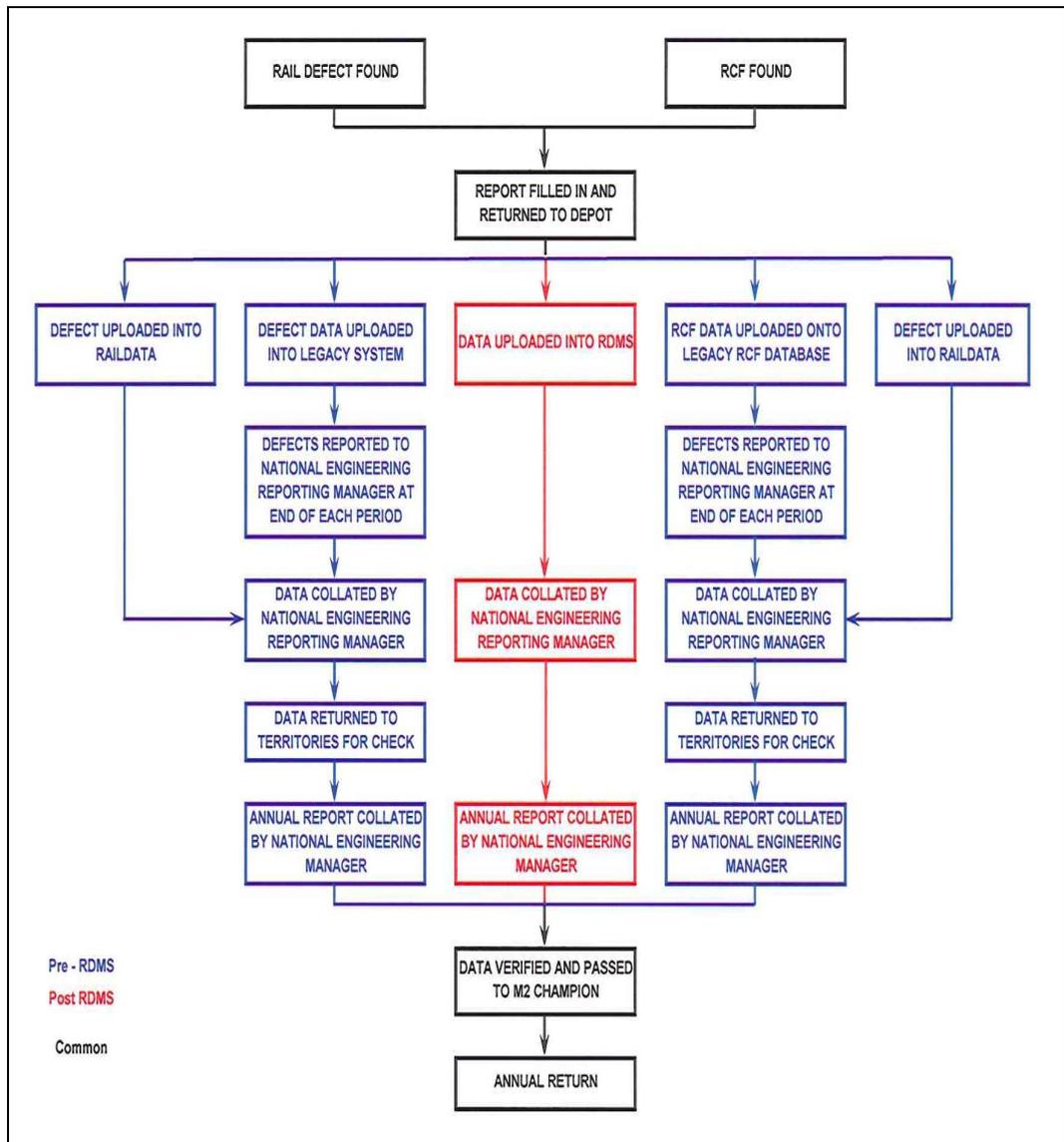


Figure 7.2.3 Process map of rail defects recorded in RDMS

- 7.2.12 RDMS is linked to ELLIPSE, and produces the work orders needed to ensure defects are removed within the minimum action time mandated in the standards.

- 7.2.13 Defects and suspects are separated in RDMS, which is an improvement on the previous legacy systems, which recorded all suspects found by the UTU and any rail marks as defects. Once the suspect is confirmed, it is then moved to the defects section within RDMS and given the appropriate action code, which mandates a time for rectifying the defect.

#### *Accuracy of reported data*

- 7.2.14 We compared a sample of 6 defect report forms from the sample delivery units with the data entered onto RDMS. In all of the sample areas, the defect forms were completed in accordance with the procedure and had been entered correctly into the databases.
- 7.2.15 RDMS is an integral part of the defect management process. Engineers in each sample delivery unit were confident regarding the accuracy of the defect data within RDMS and our sample audit concurred with this assertion. However, the transfer of data from the legacy systems to RDMS part way through the year resulted in only 'live' defects being transferred to the new system, which means that defects removed before the transfer could only be found in the legacy systems.

#### **Assessment of confidence grade**

- 7.2.16 **Reliability grade.** The definition for this measure is clearly documented. A documented process has been followed to collect and report data for this measure. However, data correction has been required at the start of each reporting year for the last five years, including for 2008/09. We believe that M2 should have a reliability grade of B.
- 7.2.17 **Accuracy grade.** We have concerns regarding the level of data correction required at the start of the 2008/09 reporting year. These concerns have persisted due to the delay of the new RDMS system which was introduced part way through the year and the partial transfer of data to the new system. Therefore, we believe that M2 should have an accuracy grade of 3.

#### **Audit Statement**

- 7.2.18 We have audited the data and commentary presented in Network Rail's Annual Return 2009 for Number of Rail Defects (M2). We can confirm the data has been collected and reported in accordance with the relevant definition and procedure. The data has been assessed as having a confidence grade of B3.

#### **Recommendations arising**

##### *Recommendations essential for the accuracy and/or reliability of the measure*

- 7.2.19 We have no recommendations for this measure, now that RDMS has been introduced across the network.

##### *Observations relating to spreading of best practice and/or improvements to process*

- 7.2.20 We have no observations for this measure.

#### **Progress on outstanding recommendations from previous audit reports**

We set out below our assessment on the current progress of Network Rail in addressing our outstanding recommendations for Rail Defects (M2) from our previous Audits:

Recommendations made	Progress update
<p><b>2008-R18:</b> For the third year in succession we have recognised the concentrated effort to reduce RCF type defects with rail grinding and re-railing particularly. However, the visibility of the results of this work is not reflected in the continuous rail defect figures. Therefore, to make this more visible, we recommend again that an RCF Heavy &amp; Severe category is reported separately in order to make visible the removal of Heavy &amp; Severe RCF defects. This would enable the benefit of the rail grinding and re-railing work to be assessed.</p>	<p><b>Current Status – In Progress</b></p>
<p><b>2008-R17:</b> For the fourth year in succession we remain concerned as to the reliability and accuracy of data reported and the extent of 'data refreshes' at the start of each year for the M2 measure which has directly led to the confidence grade of B3. We recommend that Network Rail ensure that the data that is transferred to the new national system, RDMS, is consistent, from the most accurate source and is systematically checked by the Territories and Areas (Routes and Depots).</p>	<p><b>Current Status – In Progress</b></p>
<p><b>2007-R15:</b> We still remain concerned as to the accuracy of data reported and the extent of 'data refreshes' at the start of each year for the M2 measure which has directly led to the confidence grade of B3. We recommend that Network Rail ensure that the data that is transferred to the new national system, RDMS, is from the most accurate source and is systematically checked by the Territories and Areas.</p>	<p>There was evidence during this year's audits that this data cleansing was being undertaken, however this still remains a concern and has been repeated .above. <b>Current Status – Repeated in later year</b></p>
<p><b>2007-R16:</b> We have recognised the concentrated effort to reduce RCF type defects with rail grinding and re-railing particularly. However, the visibility of the results of this work is not reflected in the continuous rail defect figures. Therefore, to make this more visible, we recommend again that an RCF Heavy &amp; Severe category is reported separately in order to make visible the removal of Heavy &amp; Severe RCF defects. This would enable the benefit of the rail grinding and rerailing work to be assessed.</p>	<p>Network Rail have advised that it will be possible to record light/moderate and heavy/severe RCF separately in RDMS. This is still a concern and has been repeated .above. <b>Current Status – Repeated in later year</b></p>

Figure 7.2.4 Progress on outstanding recommendations for Rail Defects (M2)

## 7.3 Track geometry (M3 & M5)

### Audit scope

- 7.3.1 These audits were undertaken to assess the reliability and accuracy of the data and commentary reported in Network Rail's Annual Return 2009, Section 3, for Track geometry.
- National standard deviation data (M3), including Tables 3.8 – 3.11. National standard deviation (SD) data is expressed in terms of the percentage of track within the 100% ('poor' or 'better'), 90% ('satisfactory' or 'better') and 50% ('good') bands for four track geometry parameters.
  - Poor track geometry (M3), including Table 3.12. This index is calculated using the national SD data results for the percentage of track identified as 'very poor' in terms of the four track geometry parameters together with the percentage of track defined as 'super-red'.
  - Level 2 exceedences (M5), including Tables 3.16 & 3.17. Level 2 exceedences are distortions in track geometry identified for short lengths of track using the 35m wavelength measurements.
- 7.3.2 The definition and procedures for these measures are documented in NR/ARM/M3DF (issue 5), NR/ARM/M5DF (issue 4) and NR/ARM/M3PR (issue 6).
- 7.3.3 Speed band data has been omitted this year, as agreed by Network Rail and the ORR.
- 7.3.4 These measures use a common data collection process; we have therefore audited and reported on these measures together. Audits were undertaken at Network Rail Headquarters.

### Commentary on reported data

#### Regulatory target

- 7.3.5 The regulatory target for M3 track geometry for 2004/05 to 2008/09 (Control Period 3) is set in ORR's Access Charges Review 2003; the target is to maintain the network at or better than the baseline level recorded in 2003/04.

#### National standard deviation data (M3)

- 7.3.6 The track geometry results for the 2008/09 reporting year are presented in Figure 7.3.1.

Geometry parameter	35m Top (Vertical Deviation)			35m Alignment (Horizontal Deviation)			70m Top (Vertical Deviation)			70m Alignment (Horizontal Deviation)		
	50%	90%	100%	50%	90%	100%	50%	90%	100%	50%	90%	100%
Results for 2008/09	76.5%	94.6%	98.8%	82.5%	96.2%	98.3%	78.3%	96.6%	97.9%	89.9%	98.3%	98.9%
Regulatory target	62.4%	89.2%	97.0%	72.7%	92.9%	96.5%	63.6%	92.4%	95.3%	79.5%	95.8%	97.2%
Result against target	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Figure 7.3.1 National SD data (M3)

7.3.7 All twelve of the regulatory targets for M3 track geometry national standard deviation data were met in 2008/09.

**Poor track geometry (M3)**

7.3.8 There are no regulatory targets for poor track geometry.

**Level 2 Exceedences (M5)**

7.3.9 The regulatory target for M5 track geometry for 2004/05 to 2008/09 (Control Period 3) is set in ORR’s Access Charges Review 2003; the target been set as “no more than 0.9 Level 2 exceedences per track mile within two years”.

7.3.10 0.50 L2 exceedences per track mile were reported for 2008/09, a 16.6% improvement on 2007/08 and better than the target of 0.9.

*Trends*

7.3.11 The Annual Return Commentary attributes this continued improvement in track geometry to some renewals, but mainly better and more frequent maintenance of the track.

**National standard deviation (SD) data**

7.3.12 Figure 7.3.2 shows the national SD results for each of the twelve track geometry measures over the last five years. The results for 2008/09 for all twelve measures are at the highest level of track geometry level since 2000/01.

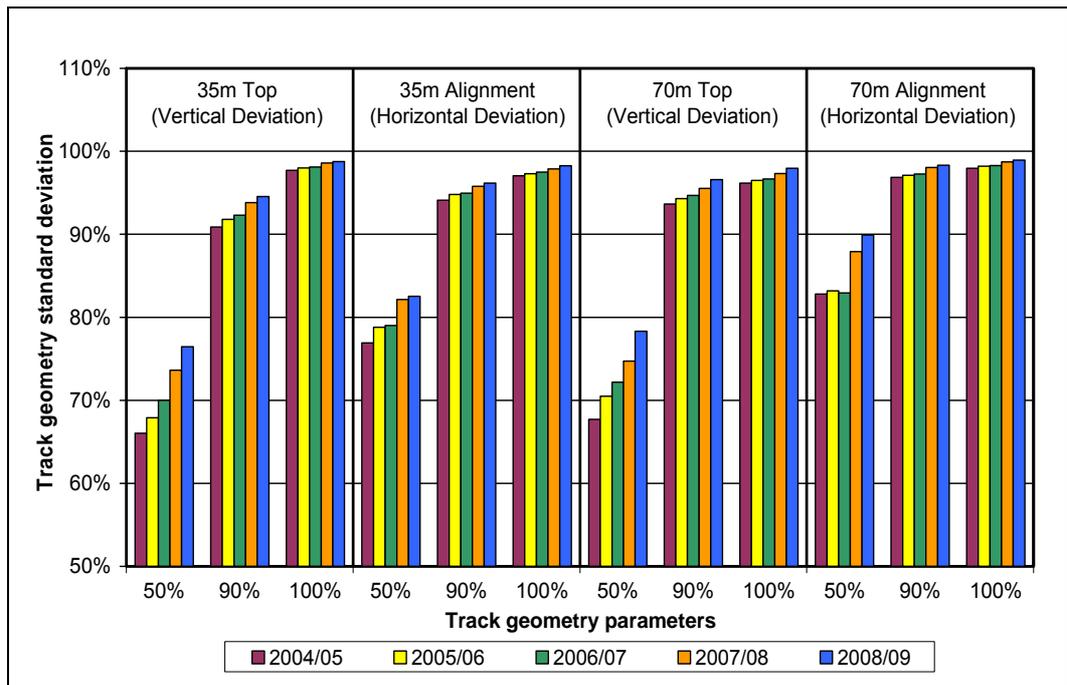


Figure 7.3.2 Track geometry standard deviation 2004/05 – 2008/09 (M3)

**Poor track geometry**

7.3.13 For the third year running, the Annual Return 2008/09 presents a measure of poor track geometry (PTG). This index is calculated using the percentage of track defined as:

- (a) ‘Very poor’: track which fails to meet the 100% (‘poor’ or better) standard;
- (b) ‘Super-red’: track which exceeds the maximum standard deviation thresholds for the 35m vertical and horizontal alignments.

7.3.14 The trends for poor track geometry on each Route are shown in Figure 7.3.3; this shows a continuing improvement for all routes. London North Eastern Route has been split into London North Eastern and Midlands and Continental (which includes HS1) for 2008/09. The results for these routes have been calculated back to 2006/07 only.

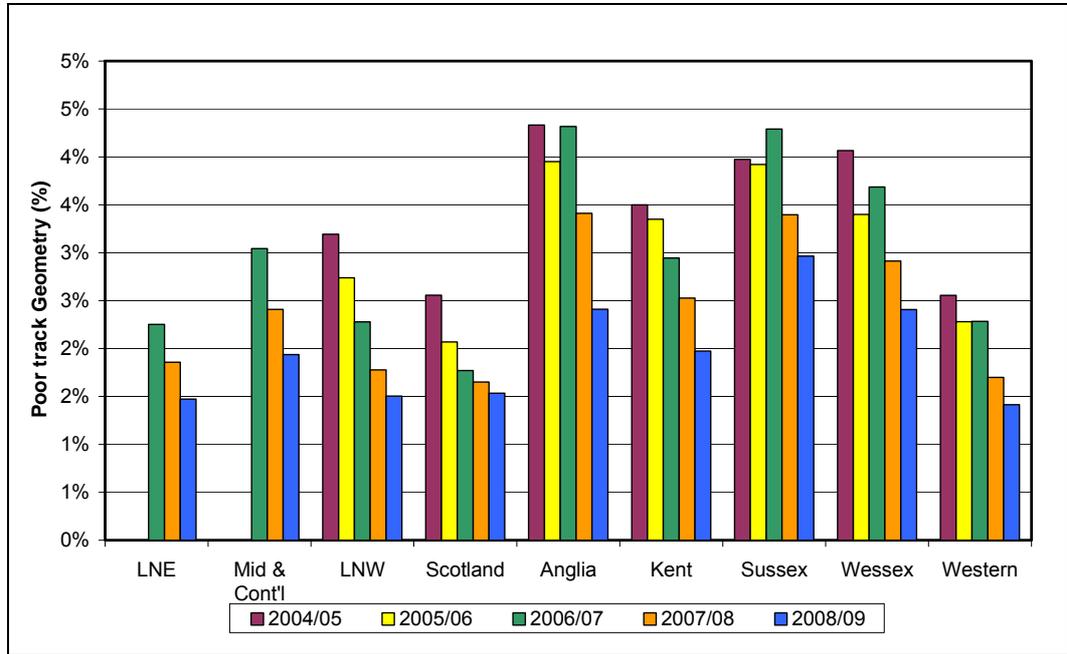


Figure 7.3.3 A comparison of Route PTG 2004/05 - 2008/09 (M3)

**Level 2 Exceedences**

7.3.15 Figure 7.3.4 shows that this year all Routes had the lowest level of Level 2 exceedences per track mile for the last five years. London North Eastern Route has been split into London North Eastern and Midlands and Continental (which includes HS1). The results for these routes have been calculated back to 2006/07 only.

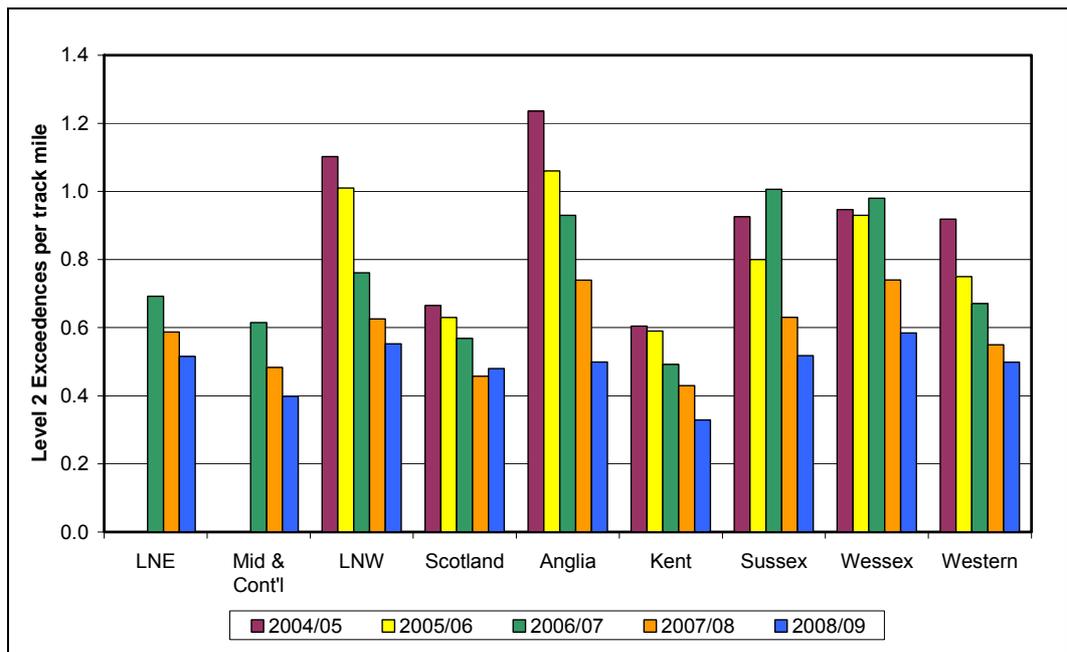


Figure 7.3.4 Level 2 exceedences for 2004/05 - 2008/09 (M5)

**Audit findings**

7.3.16 Network Rail have four track recording vehicles operating across the network (TRU, TIC, NMT and SMT) which conduct the ‘compliant runs’ in accordance with the frequencies set out in the annual track measurement plan. The Southern Measuring Train (SMT) is now being used for recording compliant runs, not just monitoring as last year.

*Calibration*

7.3.17 The four track recording vehicles are cross-checked against one another on recording runs and go through a yearly audit.

*Process*

7.3.18 Figure 7.3.5 shows the process by which track geometry data is compiled and reported.

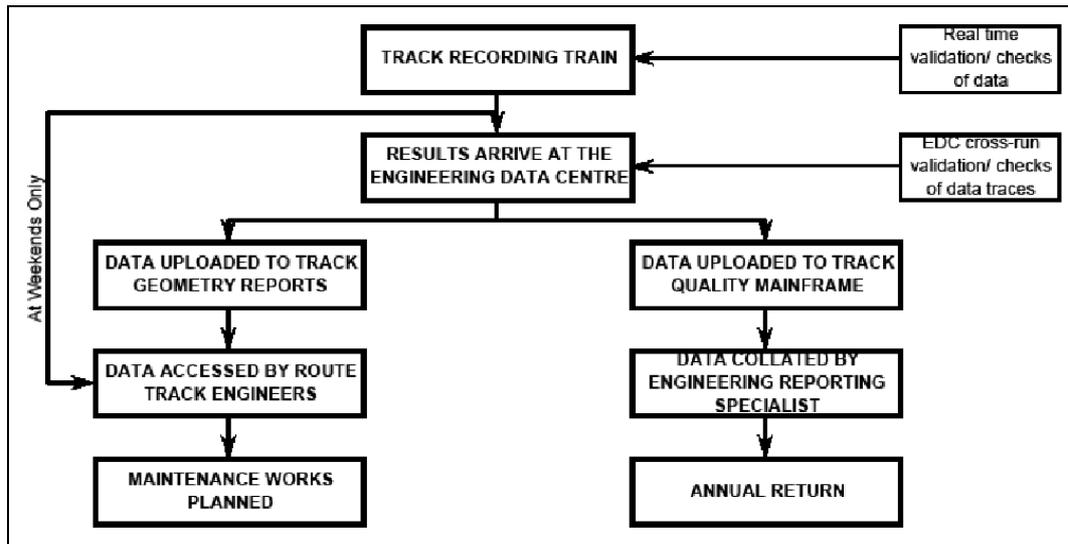


Figure 7.3.5 Process map of compilation and reporting of track geometry data

7.3.19 We verified the process described above.

**Assessment of confidence grade**

7.3.20 **Reliability grade.** The definition for this measure is clearly documented. The procedure is clearly defined and is well controlled. The collection and reporting of this measure is a closely managed process which has been in operation for a number of years. We believe that both M3 & M5 should have reliability grades of A.

7.3.21 **Accuracy grade.** The data shows considerable consistency between measurement runs; the calculations are subject to checking. We believe that both M3 & M5 should have accuracy grades of 1.

**Audit Statement**

7.3.22 We have audited the data and commentary presented in Network Rail’s Annual Return 2009 for Track Geometry (M3 and M5). We can confirm the data has been collected in accordance with the relevant definition and procedure. The data has been assessed as having a confidence grade of A1 for both measures. All targets for these measures were met.

**Recommendations arising**

*Recommendations essential for the accuracy and/or reliability of the measure*

7.3.23 We have no recommendations for this measure.

*Observations relating to spreading of best practice and/or improvements to process*

7.3.24 We have no observations for this measure.

**Progress on outstanding recommendations from previous audit reports**

7.3.25 We set out below our assessment on the current progress of Network Rail in addressing our outstanding recommendations for Track Geometry (M3 & M5) from our previous Audits:

Recommendations made	Progress update
<p><b>2006-R22:</b> With the anticipated introduction of the Laserail 3000 method of measurement in 2006/07, the calibration process and cross-vehicle validation process will need to be broadened to include the new method. We recommend that the current procedure for the calibration and cross-vehicle validation processes should be upgraded from a working document to a formally issued and controlled company standard or company procedure.</p>	<p><b><i>Current Status – No Action or Timescales Identified</i></b></p>

**Figure 7.3.6 Progress on outstanding recommendations for Track Geometry (M3 & M5)**

## 7.4 Condition of asset temporary speed restriction sites (M4)

### Audit scope

- 7.4.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2009, Section 3, Condition of asset temporary speed restriction sites (M4), including tables 3.13 – 3.15.
- 7.4.2 This measure reports:
- (a) The total number of emergency speed restrictions (ESRs) and planned temporary speed restrictions (TSRs) arising from the condition of track, structures and earthworks, in place for 28 days or more;
  - (b) The total severity scores for planned TSRs and ESRs (jointly referred to as 'TSRs'), which are derived using an algorithm based upon the length, duration and speed limit imposed compared with the prevailing line speed.
- The measure does not include Temporary Speed Restrictions (TSRs) planned in conjunction with planned engineering works as these should already be taken into account by engineering allowances in the working timetable.
- 7.4.3 The measure is a proxy for the condition of the assets and the quality of Network Rail's asset stewardship. The impact of TSRs on train performance is not reflected.
- 7.4.4 The definition and procedures for this measure are documented in RT/ARM/M4DF (issue 5) and RT/ARM/M4PR (issue 6) respectively.
- 7.4.5 The audit was undertaken at Leeds, where the collection and reporting of track TSRs is undertaken, and also at Euston, where the collection and reporting of structures and earthworks TSRs is undertaken.

### Commentary on reported data

#### *Regulatory target*

- 7.4.6 The regulatory target for M4 condition of asset temporary speed restriction sites for 2004/05 to 2008/09 (Control Period 3) is set in ACR2003; the target is "annual reduction required" which we have interpreted as a requirement to maintain the network at or below the baseline level recorded in 2004/05, delivering year on year improvements.
- 7.4.7 In 2008/09 there were 438 condition of asset TSRs on the network reportable for this measure with a total of severity score of 2284 bettering the baseline target by 23% for the number of sites and by 18% for the severity score. These reported results would meet the regulatory target.

#### *Trend*

- 7.4.8 Western Route sites are down for the second year running and London North-Eastern and London North-Western Routes have the highest number of sites
- 7.4.9 Midland and Continental Route data is skewed by the Coalville line, a freight only route which is subject to a TSR throughout. The route currently sees three trains per day but accounts for 566 points out of the Route's severity score of 1022. The London North Western Route score of 812 is skewed by two sections. These are Bedford –Bletchley (214) and Buxton-Peak Forest (127).
- 7.4.10 Route data in East Anglia is skewed by long running TSRs in the Ely area, which have a low operational performance impact.
- 7.4.11 Reported TSRs continue to be dominated by track-related faults in respect of both the total number and the total severity score.
- 7.4.12 The overall percentage improvement is lower over the previous year than it was in 2007/8.

## Audit Findings

### Process

#### Track

- 7.4.13 Data for the track part of this measure is derived from the Possessions Planning System (PPS). Data input to PPS comes from two sources. Firstly Area Delivery Planning Teams (ADPT) input data initially sourced from track engineers and reported to the local depot. The depot completes a form which goes to the ADPT for publication of information in weekly operating notices (WONs). Secondly, Temporary Speed Restrictions (TSRs) are entered into the system by the local Possession Planning Teams as either (a) TSRs that are planned and approved or (b) converted from Emergency Speed Restrictions to TSRs at the end of a 4-week qualifying period.
- 7.4.14 This measure only takes account of possessions that last 28 days or more. In practice, Network Rail estimate, a typical time interval for removing a TSR is between 7 and 14 days. Therefore this measure records only long term TSRs,
- 7.4.15 At year end, the reportable TSR data is sourced from PPS by the Acting Possession Systems Support Specialist (APSSS) and is manually manipulated and supplemented before entry into a calculation spreadsheet which contains algorithms for calculating the severity scores and number of planned TSRs from the input data.
- 7.4.16 The initial spreadsheet contains data items encompassing all TSRs throughout the year, including those arising from safety and renewals work, both of which are excluded from the measure. The data is manually sifted to remove everything except incidents that are relevant to the measure. These are then manually sifted again in order to link together TSRs at the same site ("parent-child" groupings). This sift is aimed at removing the possibility of double counting.

#### Earthworks and structures

- 7.4.17 Responsibility for calculating this measure lies with the Headquarters Engineering Reporting Manager (HQ ERM). The process for the 2009 measure remains as in previous years, with the five Territory Engineers submitting a spreadsheet each period with details of incidents. These are quality checked by the Headquarters ERM and if necessary, further supplementary data is requested.
- 7.4.18 The Territory submissions are reviewed by the Civil Engineering HQ. The submissions are cross checked against the company-wide weekly TSR spreadsheet produced by the Maintenance organisation.
- 7.4.19 The results from the Territories are aggregated for the purposes of internal Network Rail reporting each period. The source data includes all TSRs, both those above and those below the 28 day threshold required for inclusion in the measure. The Annual Return is compiled from this source data set.
- 7.4.20 At the year end, the actual number of incidents, the Areas they are assigned to and definitions allocated are verified against the original source data supplied by the Territory Engineers. Checks are made on this before the severity score is calculated. However, a continuity check is made, to ensure that any gaps in reporting are filled in, as is a data completeness check. Any gaps are referred back to the Territory Assurance Engineers. If they fail to respond, or to make required changes, then the WON or another published source is referred to in order to complete the data set. This is a change from previous years, when the analyst completed the data without reference back to the Territory.
- 7.4.21 The source spreadsheets are also shared with the Acting Possessions Support Specialist, enabling cross-checking between the two parts of M4 to take place.

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### *Asset management*

- 7.4.22 Performance against the measure suggests that the condition of the asset base is improving. However, as stated in previous years' reports, we have strong doubts as to the usefulness of this particular measure. In particular, its restriction to only those speed restrictions in place for 4 weeks or more ensures that only a snapshot, rather than a panoramic view of infrastructure management is given by the measure. Furthermore, the severity score has no direct link to route importance, performance impacts and the cost of fixing the problem. As such, it is not an accurate measure of the impact of the TSRs recorded under the measure.

### *Accuracy of reported data*

- 7.4.23 In terms of data audit, the source spreadsheet contains all TSRs that appear in the WONS, giving a direct audit trail. Moreover, much of the data for the measure is taken directly from the Possession Planning System (PPS). Thus as long as that data set is comprehensive then the base data used to calculate the Annual Return figures should be correct.
- 7.4.24 However, there are some omissions, such that the M4 measure cannot be wholly produced using PPS without manual interventions. These include the manual inputting of line speeds, an essential component of the severity score. Manual analysis of the data is also required to match different (and consecutive) entries against the same location. Records change if for example, a speed restriction is worsened to allow for temporary track work to prevent further degradation of the asset before full repair can be affected. The necessity for manual intervention leaves the reporting of the measure open to some degree of error.
- 7.4.25 To mitigate this, checks are built into the system. Both the APSSS and the Headquarters ERM run cross-checks on the data they receive to ensure it is accurate. Automatic checks are also built into the spreadsheet that calculates the severity score.
- 7.4.26 Emergency Speed Restrictions (ESRs) remain an issue of risk in terms of accurate reporting. Any ESR longer than a week should be formally documented and included in the WON. A consequent TSR, should then be backdated to the beginning of the ESR within PPS. However, this may not always happen and ESR information will not therefore be complete. Mitigation is achieved by the APSSS via a manual check but a risk of ESRs being overlooked during this check, while probably low, does still exist.
- 7.4.27 There are three main areas of risk to the reliability of the process and accuracy of the resulting data:
- (a) The local teams might not correctly backdate an unplanned TSR when it is entered into PPS to reflect the actual date of commencement of the original ESR;
  - (b) The degree of manual data intervention requires (i) a good knowledge of railway geography and naming conventions, and (ii) considerable diligence;
  - (c) The compilation of the track measure using the calculation spreadsheet remains largely within the expertise of one individual.

### *Quality and accuracy*

- 7.4.28 Samples have been undertaken by Network rail of the accuracy of severity scoring in route data for Anglia and Wessex. A 4-5% error was found in the severity scores here but they reported this did not appear to affect trend data.
- 7.4.29 Full sets of data were also supplied for all Routes and these were checked for consistency in formulas and outputs. The data and formulas appeared to be in order, including test checks built into the spreadsheet to verify that the data has been handled correctly.

- 7.4.30 The audit team was shown the structure of electronic information folders, including data sources from the relevant Assurance Engineers, and these appeared to be in order. Territory Assurance Engineers forward their data every four weeks and these are checked at headquarters level. This information is exchanged and analysed by correspondence. Network Rail is looking into establishing an electronic data management system for this information.
- 7.4.31 The Assurance Engineers source their information locally from their teams. This suggests that some reporting may be done on an informal basis and some inaccuracies could creep in.
- 7.4.32 A number of decisions are taken by the analyst in the course of the initial analysis leading to the production of the TSR score. These are likely to affect the accuracy of the reported data to some extent.
- 7.4.33 It is understood that about 10% of TSRs make up about 90% of disruption caused. Furthermore TSRs that are long but not very restrictive are heavily weighted in the severity calculation and so their impact may be to some extent exaggerated in this measure.
- 7.4.34 We are satisfied that the process is carried out conscientiously and knowledgeably. Significant efforts are made to by the Acting Possession Systems Support Specialist and Headquarters ERM to check data accuracy.

### Assessment of confidence grade

- 7.4.35 **Reliability grade.** The definition of the measure is clearly documented. The procedure is applicable and has been demonstrably followed; however, the procedure does not fully document the full extent of manual processing and checking undertaken, which put the reliability of the process at risk. We believe M4 should continue to have a reliability grade of B.
- 7.4.36 **Accuracy grade.** The PPS system provides a high degree of accuracy for the base data, as it is the source material for the Weekly Operating Notice (a key document for both engineering and operations staff which is subject to rigorous oversight). However, the accuracy of the process is affected by risks from the degree of manual review and manipulation of raw data to produce the result. We believe M4 should continue to have an accuracy grade of 2.

### Audit Statement

- 7.4.37 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2009 for Condition of Asset Temporary Speed Restriction Sites (M4). We can confirm that the data has been collected and reported in accordance with the relevant definition and procedure with the minor risks outlined regarding ESRs and manual data manipulation. The data has been assessed as having a confidence grade of B2.
- 7.4.38 Notwithstanding the above we remain concerned that the measure is not a fair reflection on Network Rail's asset stewardship. This information is only produced for the annual return and therefore for the purposes, and is thus not an aid to improving the number and severity of TSRs.

### Recommendations arising

- 7.4.39 **M4 recommendation 1.** Network Rail and the ORR should develop alternative measures that would directly improve management of the Network.
- 7.4.40 **M4 recommendation 2.** The current measure is not used to feed in to improvement programmes with respect to reducing future disruption related to TSRs. Consideration should be given to actively using the information to establish priorities for TSR reduction to maximise the reductions achieved.

- 7.4.41 **M4 recommendation 3.** The severity calculation should be reviewed and revised if possible to ensure that the formulae used to not lead to outputs which over or underestimate the severity of TSRs whose operational impact may not be that great.
- 7.4.42 **M4 recommendation 4.** An electronic document management system should be established at the earliest opportunity to better ensure integrity of document management.
- 7.4.43 **M4 recommendation 5.** The Territory Assurance Engineers should take measures to ensure that reporting to them is as accurate as possible. Headquarters functions should help them develop the means to do this.

*Observations relating to spreading of best practice and/or improvements to process*

- 7.4.44 **M4 observation 1** The existence of sites that skew a route's results can be interpreted as evidence that effort in reducing TSR severity goes into the busiest routes. If this is so it will be the case that lightly used lines where TSRs may be of low consequence in practice are being given undue significance in this measure.

**Progress on outstanding recommendations from previous audit reports**

- 7.4.45 **2008 M4 recommendation 1.** As this year we expressed doubts as to the usefulness of this measure. And recommended that Network Rail and ORR worked to agree a relevant and useful measure for the 2009 Annual Return which more accurately reflects Network Rail's management of the asset base and which represents less of a resource drain in its compilation and reporting. This has not been actioned.

## 7.5 Earthworks Failures (M6)

### Audit scope

- 7.5.1 These audits were undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2009, Section 3, Earthworks Failures (M6), including Table 3.18.
- 7.5.2 This measure reports the number of rock fall or soil slip, slide or flow in a cutting or natural slope, or soil slide or slip in an embankment or natural slope. Failures causing a passenger or freight train derailment are recorded separately.
- 7.5.3 The definition and procedure for this measure are documented in NR/ARM/M6DF (issue 6) and NR/ARM/M6PR (issue 4).
- 7.5.4 Audits were undertaken at Network Rail Headquarters and at three of the Routes – London North East, Southern and Western.

### Commentary on reported data

#### Regulatory target

- 7.5.5 The regulatory target for earthworks failures set in ORR's Access Charges Review 2003 is to be no deterioration from the 2003/04 levels, which was 47 network wide Earthworks failures.
- 7.5.6 There were 61 Earthworks failures in 2008/09, which means that the target has not been met for the year.

#### Trend

- 7.5.7 Figure 7.5.1 shows the 61 earthworks failures for 2008/09. There was a 43.0% decrease in failures compared to 2007/08; 29.8% over the regulatory target. Earthworks failures causing train derailment increased from 0 in 2007/08 to 1 for the year 2008/09.

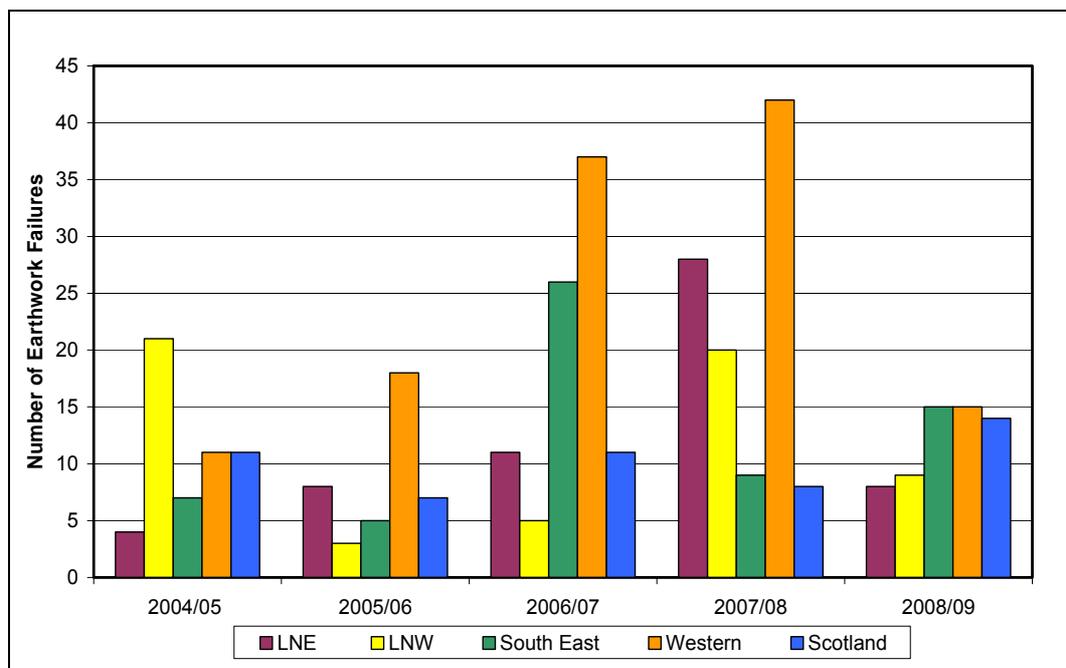


Figure 7.5.1 Number of Earthwork failures reported during the last five years (M6)

7.5.8 Figure 7.5.2 illustrates the distribution of events between Territories since 2004/05, and the large fluctuations between years. There were decreases in the number of failures in London North Eastern, London North Western and Western, and increases in the number of failures in Southern and Scotland. The increases and decreases have been attributed to the weather, but also continued examinations and remediation to earthworks and drainage.

Territory	2004/05	2005/06	2006/07	2007/08	2008/09	Variance % (07/08 vs. 08/09)
LNE	4	8	11	28	8	-71.4
LNW	21	3	5	20	9	-55.0
South East	7	5	26	9	15	66.7
Western	11	18	37	42	15	-64.3
Scotland	11	7	11	8	14	75.0
<b>Total</b>	<b>54</b>	<b>41</b>	<b>90</b>	<b>107</b>	<b>61</b>	<b>-43.0</b>

Figure 7.5.2 Variance of Earthwork failures (M6)

7.5.9 There was one incident causing a derailment in 2008/09. This was a rock fall in Scotland that resulted in one bogie of a passenger train derailing. The slope lies outside the Network Rail boundary, and had previously been categorised as poor.

7.5.10 For each earthworks incident, Network Rail also produces a hazard score. The hazard score reflects the location, severity of the hazard and the potential consequences of the incident. Hazard scores of 50 or more are considered serious and are reported to the Network Rail Board. The incident causing the derailment has a hazard score of 60, and as such will have been reported to the board.

7.5.11 Whilst the number of incidents per year remains highly variable, Fig 7.5.3 shows that the annual number of serious incidents (scoring 50 or more) has been steadily decreasing and the average hazard score per incident is also showing a continuing downward trend. There was one incident scoring 50 or more in 2008/09.

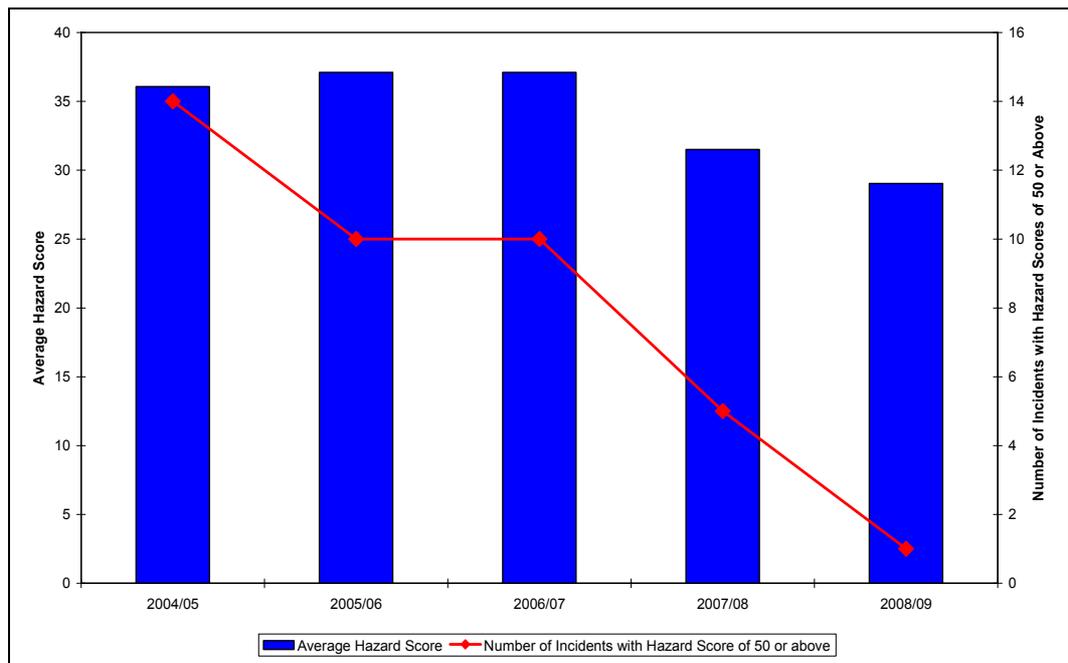
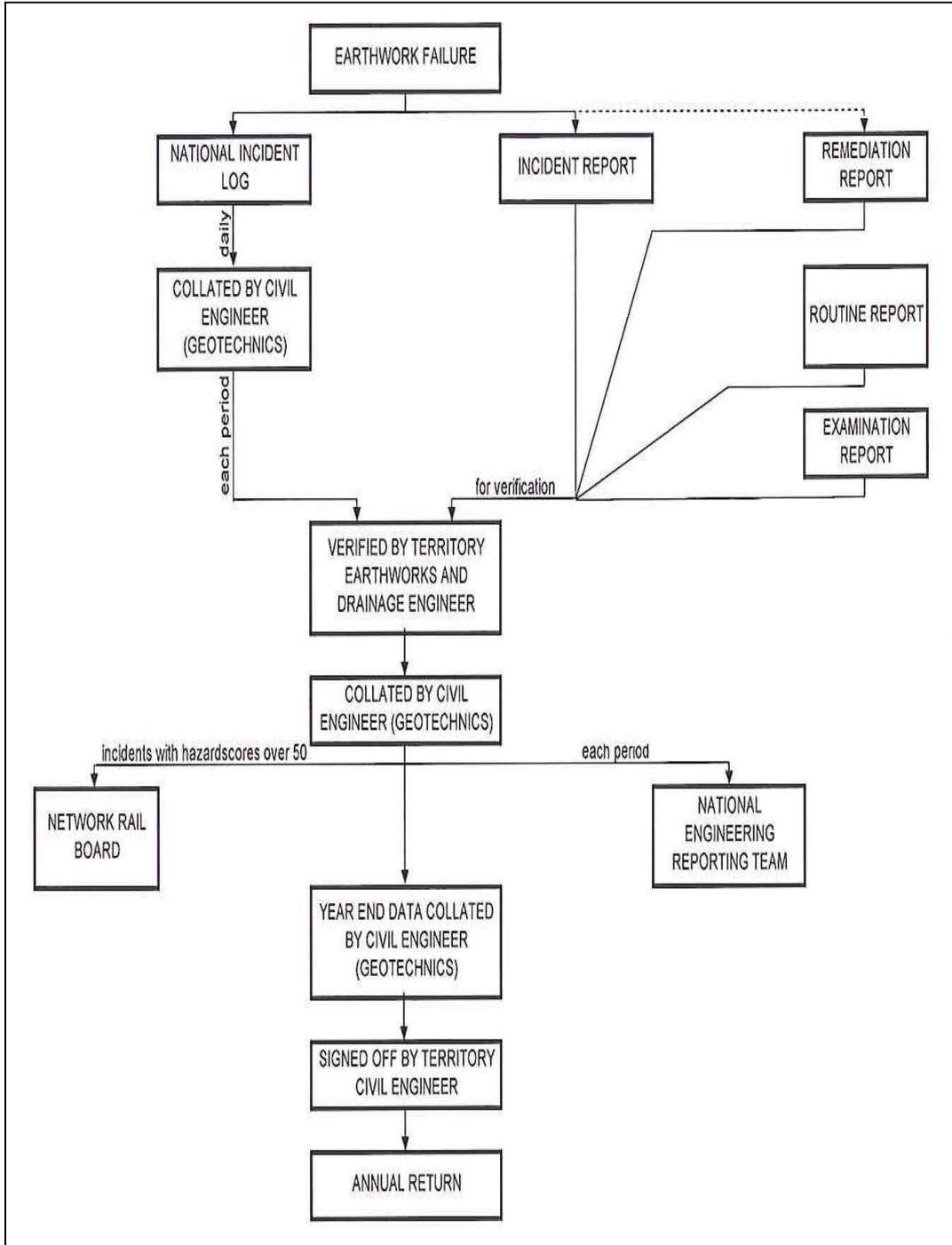


Figure 7.5.3 Incidents by Hazard Score

**Audit findings**

*Process*

7.5.12 The data acquisition, verification and reporting mechanisms for this measure have not changed this year, and are shown in Figure 7.5.4.



**Figure 7.5.4 Process map of data acquisition, verification and reporting of M6**

7.5.13 The audit confirmed that data on incidents was being collected in accordance with the reporting procedure.

7.5.14 From our audit meetings we were impressed at the way in which Network Rail had progressed in managing their earthworks assets. Each earthwork asset is now categorised into one of three conditions (Poor, Marginal or Serviceable), which then dictates a cyclical inspection regime. They are also scored using the Soil Slope Hazard Index (SSHI) and Rock Slope Hazard Index (RSHI). However, we recognise that earthworks are a high risk asset, and these advances will not prevent earthworks failures occurring.

*Accuracy of reported data*

7.5.15 For each Territory visited, we reviewed a sample of the M6 failures reported. We then compared these to the HQ spreadsheet received at the end of period 13. We found no inconsistencies.

**Assessment of confidence grade**

7.5.16 **Reliability grade.** The definitions for these measures are clearly documented. A single documented process has been followed to collect and report on these measures. The process of correctly identifying the root cause of incidents attributed to earthwork failures is not a simple process and takes time to analyse correctly. However, this has been successfully achieved for the year end deadline. Therefore, we believe that M6 should have a reliability grade of A.

7.5.17 **Accuracy grade.** The process is not sufficiently robust to ensure that the number of reported incidents is within 1%. We believe that M6 should have an accuracy grade of 2.

**Audit Statements**

7.5.18 We have audited the reliability and accuracy of data and commentary presented in Network Rail’s Annual Return 2009 for earthwork failures (M6). We can confirm the data has been collected and reported in accordance with the relevant definition and procedure. The data has been assessed as having a confidence grade of A2. The regulatory target for this measure has not been met.

**Recommendations arising**

*Recommendations essential for the accuracy and/or reliability of the measure*

7.5.19 **M6 Recommendation 1.** The existing M6 measure remains very high level, and is strongly influenced by weather events. We recommend that the asset condition information being collected should be used to form the basis for a new measure for earthworks asset condition, to give a better indication of asset stewardship.

*Observations relating to spreading of best practice and/or improvements to process*

7.5.20 **M6 Observation 1.** Each of the failures is recorded according to NR/WI/CIV/028, and under this specification they are attributed a hazard score. Reporting this hazard score as a part of M6 would enable visibility of trends in the severity of failures, and the risk they pose to the railway.

**Progress on outstanding recommendations from previous audit reports**

7.5.21 We set out below our assessment on the current progress of Network Rail in addressing our outstanding recommendations for earthwork failures (M6) from our previous Audits:

Recommendations made	Progress update
<p><b>2008-R23:</b> We recommend that the definition be further amended to separate multiple embankment and cutting failures that occur on the same Engineers Line Reference on the same day but are some distance apart</p>	<p>Network Rail has updated the definition to address our recommendation. <b>Current Status – Actioned and verified</b></p>

<p><b>2008-R22:</b> We recommend that the asset condition information being collected should be used to form the basis for a new measure for earthworks asset condition.</p>	<p><b><i>Current Status – Repeated in later year</i></b></p>
<p><b>2007-R21:</b> Reporting of multiple failures caused by a single event needs to be clearly defined. Currently all Territories are reporting failures such as this consistently but it would be useful for this to be defined within Network Rail's Asset Reporting Manual. Such a review should consider the process of reporting to ensure it is consistently applied across the Territories by all those involved.</p>	<p>Network Rail has updated the definition to address our recommendation. However, as discussed above, we do not agree with their revised definition and have made a further recommendation this year.</p> <p><b><i>Current Status – Actioned and verified</i></b></p>

**Figure 7.5.5 Progress on outstanding recommendations for earthwork failures (M6)**

## 7.6 Bridge condition (M8)

### Audit scope

- 7.6.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2009, Section 3, Bridge condition (M8), including Table 3.19.
- 7.6.2 This measure assesses Network Rail's stewardship of bridges. The condition of each bridge is assessed using the Structures Condition Marking Index (SCMI) at the same time as it receives its six-yearly detailed examination. Each element of the structure is given separate severity and extent scores which produce a condition score from 1 to 100. These are converted into condition grades which are integers from 1 to 5, where 1 is good and 5 is poor. 100-80 is condition grade 1, 79-60 is condition grade 2, 59-40 is condition grade 3, 39-20 is condition grade 4, and 19-1 is condition grade 5.
- 7.6.3 The definition and procedure for this measure are documented in the Network Rail Asset Reporting Manual, documents NR/ARM/M8DF (issue 5) and NR/ARM/M8PR (issue 5).
- 7.6.4 Audits were undertaken at Network Rail Headquarters (HQ) and in 3 Routes – Western (Swindon), London North East (York) and Southern (Waterloo).

### Commentary on reported data

#### *Regulatory target*

- 7.6.5 The regulatory target for structure condition set in ORR's Access Charges Review 2003 was for the condition of the structures assets to be maintained at a level equal to the baseline level recorded in 2001/2002. In numerical terms, the regulatory target was an average condition score of not greater than 2.1. However, Network Rail have discussed and agreed with ORR that a full target cannot be established until all bridges have been assessed. Therefore, there is currently no regulatory target for this measure.

#### *Trends*

- 7.6.6 SCMI scores for 4,122 bridges were entered into the tool in 2008/09. This brings the cumulative total of SCMI reports to 28,832. This total includes bridges that have now had second cycle examinations. The early sets of data collected prior to April 2003 are considered unreliable. Our analysis is therefore based on the data from 03/04 onwards. This comprises 24,497 scores across six examination years.
- 7.6.7 The total population of assets which would qualify to have an SCMI examination remains uncertain. The Civils Asset Register and electronic Reporting System (CARRS) holds details of most of Network Rail's civil assets; however, it does not have the facility to distinguish those structures requiring an SCMI score. Anecdotal information provided by the territories suggests that around 98% of the stock has now been assessed and included within the SCMI reporting tool.

7.6.8

Exam Year	Average Band	Average SCMI Score	Volume of Exams
03/04	2.04	69.2	4296
04/05	2.09	67.7	4337
05/06	2.15	66.3	5002
06/07	2.12	67.2	4063
07/08	2.13	66.9	2677
08/09	2.10	65.7	4122
<b>Years 03-08</b>	<b>2.11</b>	<b>67.2</b>	<b>24497</b>

Figure 7.6.1 shows the average SCMI band and SCMI score for structures examined since April 2003.

7.6.9

Network Rail currently reports data based on its entry date into the SCMI tool and not its actual examination date. We have also analysed the data based on the examination date, to give a better indication of the condition of the asset.

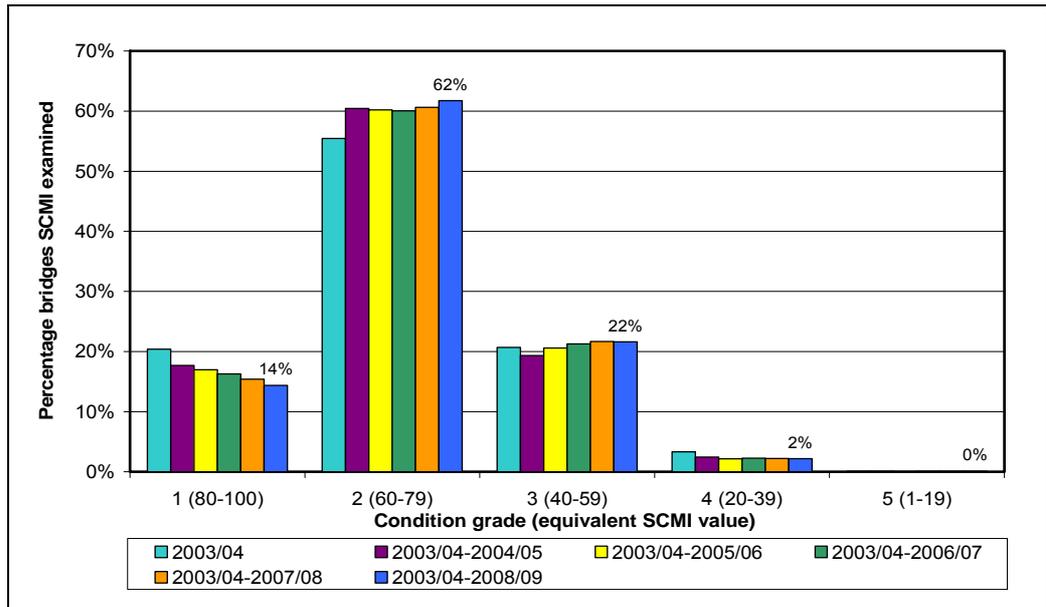


Figure 7.6.2 Bridge condition reported during the last six years (M8)

7.6.10

Figure 7.6.2 illustrates the cumulative distribution of grades for the past five years. Currently 62% of bridges scored are in condition grade 2, 76% are in the top two grades, and 98% are in the top three grades

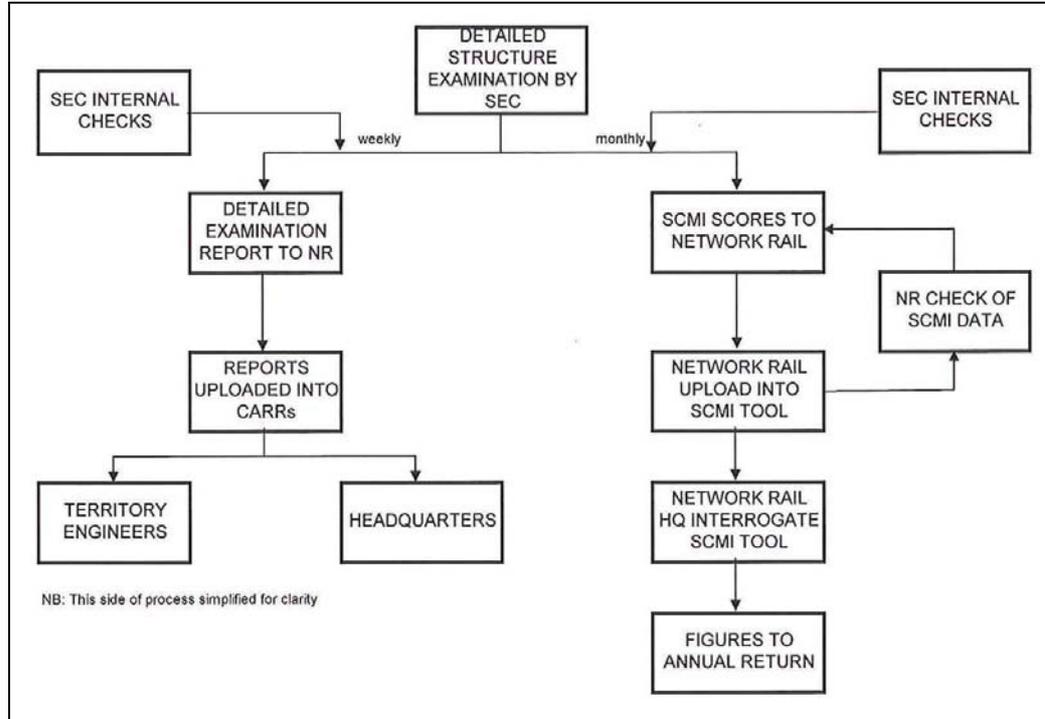
7.6.11

The full asset population has not yet been inspected and as the programme has not been conducted on a fully randomised basis we are unable to draw conclusions regarding a trend.

**Audit findings**

*Process*

- 7.6.12 The data acquisition, verification and reporting mechanisms for this measure have not materially changed for the reporting year 2008/09.
- 7.6.13 Figure 7.6.3 outlines the process by which the bridge condition data is collected and reported.



**Figure 7.6.3 Process map of collection and reporting of bridge condition data (M8)**

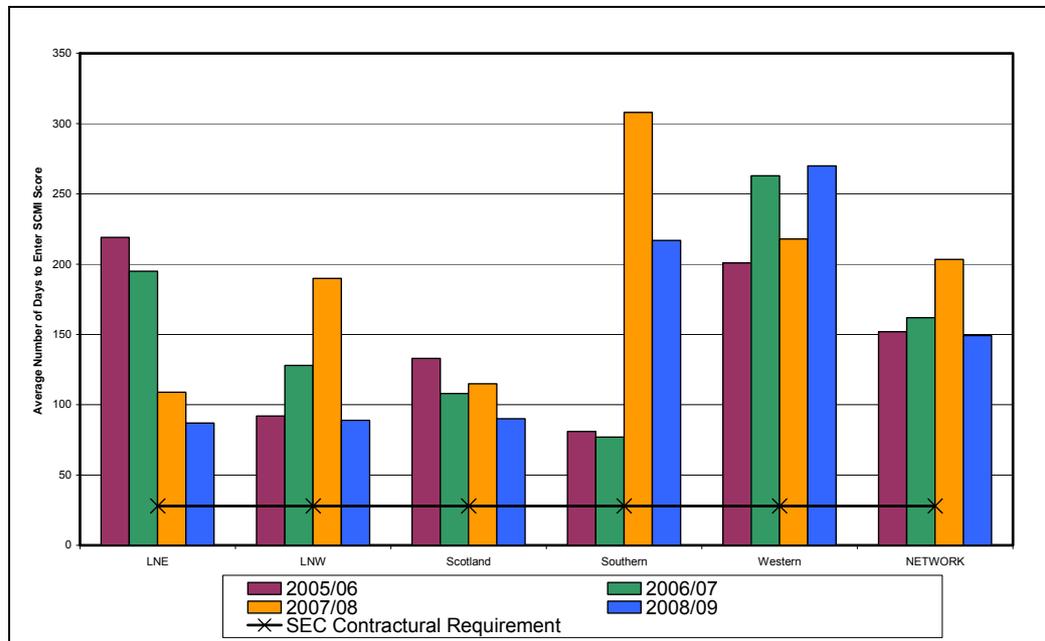
- 7.6.14 The SCMI examination is undertaken at the same time as a detailed examination, which are generally on a historically pre-defined six-year cycle. Our audit was broadly satisfied that this cycle is being adhered to.
- 7.6.15 On the basis that the first cycle of reliable SCMI scoring commenced in 03/04, the full six year cycle should therefore be complete by this reporting year. We have found that this is very nearly the case in the territories visited, and it may be that SCMI scores waiting to be put on the system will complete the cycle.
- 7.6.16 The process for transfer of SCMI information still contains a number of manual processes which add delay. The Structures Examination Contractors (SECs) submit SCMI scores on a periodic basis, and these are then uploaded into the SCMI tool by Network Rail personnel. There remains considerable scope for efficiency improvements in the process.

*Accuracy of reported data*

**Programme**

- 7.6.17 CARRS is still being used across all the Routes. It is used to manage the examination programme, track progress and hold copies of the examination reports. Network Rail Headquarters can also access examination data directly.

- 7.6.18 The CARRS database is the primary tool for identifying the asset population for the annual return. However, the present version of CARRS does not hold sufficient attribute information to identify if a structure qualifies for an SCMI examination, and so it is difficult to extract this information.
- 7.6.19 We were broadly satisfied that the programme of examinations (circa 1/6<sup>th</sup> of the population) was achieved in the 2008/2009 year.
- 7.6.20 We continue to have concern as to the length of time taken to provide the SCMI report following the date of examination. Based on information in Figure 7.6.1, we would expect around 4,400 SCMI reports to be undertaken in each year. A total of 4,122 exams were reported in 08/09, which indicates that around 280 (6.3%) were overdue. Our audits confirmed that a number of territories have a significant backlog of SCMI scores to be submitted.
- 7.6.21 Of the SCMI scores reported for 2008/09, the average time to enter an examination into the SCMI tool is 151 days. This is in comparison with the contractual requirement for the SEC to provide the examination report (including SCMI) to Network Rail within 28 days of examination but is a decrease on the 201 days from last year.



**Figure 7.6.4 Average Number of Days from Examination to Entry into SCMI by Territory (M08)**

- 7.6.22 The time taken to submit reports is significant as Network Rail undertake analysis based on the date the examination is entered on the SCMI tool, and not the examination date.

**Network Rail checks and audits**

- 7.6.23 Step 5 of the ARM procedure states that each Territory will undertake reviews of sample reports and include site visits and checks. This activity varies considerably across the network, with one territory undertaking no checking and others providing variable checking.
- 7.6.24 As we were able to find little evidence, we cannot say whether or not the ARM procedure is being adhered to.

- 7.6.25 Whilst not within the existing ARM procedure, Network Rail has historically commissioned national audits of the SEC examinations. These have the considerable advantage of assessing consistency of reporting across territories. No such national audit was conducted in 08/09 despite previous reports raising significant concerns with regard to the quality of the data.

### National comparability

#### *Training and Competence*

- 7.6.26 The new Network Rail specification, NR/SP/CTM/017 (June 2006), for examination competencies does not cover SCMI examinations. Our audit did however confirm that the SEC's were generally continuing to use the former standard for SCMI competence assessments.
- 7.6.27 Network Rail Headquarters have issued no advice to the territories or SECs this year. We are concerned that the lack of a National Champion has meant that the required focus has not been placed on SCMI. Anecdotal evidence from the territories suggests that SCMI is not a primary focus, and it has been somewhat neglected. This may explain why scores have taken so long to enter the tool.
- 7.6.28 The approach to second cycle examinations has not changed since the last report. The SEC's are still using a variety of approaches across the network. This will impact on the national consistency of SCMI data.
- 7.6.29 We note that the SCMI user group has met this year, but there has been little guidance from HQ.

### Assessment of confidence grade

- 7.6.30 **Reliability grade.** The definition for this measure is documented. The process of condition inspections is subjective, and there has been little guidance from Network Rail. We believe the M8 measure should have a reliability grade of C.
- 7.6.31 **Accuracy grade.** We remain concerned as to the number of SCMI examinations from previous years which are being reported as new condition grades in 2008/09. We believe the M8 measure should have an accuracy grade of 3.

### Audit Statements

- 7.6.32 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2009 for bridge condition (M8). We can confirm the data has generally been collected and reported in accordance with the relevant definition and procedure.
- 7.6.33 Whilst the SCMI process is well established, we have significant concerns on the ongoing accuracy of data now being collected. The lack of a Network Rail champion for this measure is a cause for concern, and this has in part led to the data being assessed as having a confidence grade of C3. This has been a long standing issue which has yet to be resolved.

### Recommendations arising

- 7.6.34 **M8 recommendation 1:** We recommend that the CARRs database be developed to include SCMI data.
- 7.6.35 **M8 recommendation 2:** We recommend that there is a national annual audit.
- 7.6.36 **M8 recommendation 3:** We recommend that NR commission research into the SCMI second cycle process and that clear instructions are issued to the SEC's.

- 7.6.37 **M8 recommendation 4:** We recommend that the procedure is altered to require that the annual return data is based on the date of examination and not the date of input into the SCMI tool, using compliance to the contractual deadline of 28 days for reporting by SEC's to Network Rail as a means of implementation.
- 7.6.38 **M8 recommendation 5:** We recommend that competency standards are re-introduced to Network Rail company standards.
- 7.6.39 **M8 recommendation 6:** We recommend that the SCMI user group is given the support it requires to enable it to function.

*Observations relating to spreading of best practice and/or improvements to process*

7.6.40 We have no observations for this measure.

**Progress on outstanding recommendations from previous audit reports**

7.6.41 We set out below our assessment on the current progress of Network Rail in addressing our outstanding recommendations for bridge condition (M8) from our previous Audits:

Recommendations made	Progress update
<b>2008-R28:</b> We recommend that the CARRs database be developed to include SCMI data.	<b>Current Status – Repeated in later year (Recommendation 1 above)</b>
<b>2008-R27:</b> We recommend that Step 5 of the ARM procedure be amended such that the requirement for local site checks and reviews is replaced by a nationally sponsored annual audit.	<b>Current Status – Repeated in later year (Recommendation 2 above)</b>
<b>2008-R26:</b> We recommend that NR commission research into the SCMI second cycle process and that clear instructions are issued to the SEC's.	<b>Current Status – Repeated in later year (Recommendation 3 above)</b>
<b>2008-R25:</b> We recommend that the procedure is altered to require that the annual return data is based on the date of examination and not the date of input into the SCMI tool, using compliance to the contractual deadline of 28 days for reporting by SEC's to Network Rail as a means of implementation.	<b>Current Status – Repeated in later year (Recommendation 4 above)</b>
<b>2008-R24:</b> We recommend that competency standards are re-introduced to Network Rail company standards.	<b>Current Status – Repeated in later year (Recommendation 5 above)</b>
<b>2008-R23:</b> We recommend that the SCMI user group is resurrected and given the support it requires to enable it to function.	<b>Current Status – Repeated in later year (Recommendation 6 above)</b>
<b>2007-R22:</b> We recommend that the competency standard is revised to include SCMI examinations, and that Network Rail ensure that the training and assessment standards for both SCMI and Examiners Competence, that satisfy NR/SP/CTM/01, are agreed by the Industry.	Network Rail recognises the absence of a SCMI standard, however they have cited competing priorities and difficulties in recruiting a 'SCMI champion' to progress the matter. <b>Current Status – Repeated in later year</b>
<b>2006-R32:</b> We recommend Network Rail reviews its plans to continue the work undertaken by Lloyd's Register Rail, as we believe the plans are both incomplete and insufficient: the Reporter has considerable concerns that the reliability and accuracy of the data collected, stored and reported will drop if these plans are not improved.	Network Rail accepted that local reporting is not working (ARM procedure step 5). Network Rail have cited budget constraints as barrier to further work. <b>Current Status – Repeated in later year</b>

Recommendations made	Progress update
<p><b>2006-R34:</b> We recommend the procedure is supplemented to give instructions for bridges which are subject to their second SCMI inspection; the alternatives are complete re-examination using SCMI or a check of the previous SCMI report. This needs to be consistent otherwise the reliability and accuracy of the data will drop as a result.</p>	<p>Network Rail accepts further information is required. Network Rail cited difficulties in recruiting a 'SCMI champion' and financial constraints.</p> <p><b>Current Status – Repeated in later year (Recommendation 3 above)</b></p>
<p><b>2006-R35:</b> We recommend the procedure should be altered to require that the Annual Return data is based on the date of examination and not the date of input to the SCMI tool, using compliance to the contractual deadline of 28 days for reporting by SECs to Network Rail as the means of implementation.</p>	<p>Network Rail are currently reviewing this recommendation but no action has been taken.</p> <p><b>Current Status – Repeated in later year (Recommendation 4 above)</b></p>
<p><b>2005-R19:</b> Independent Reporter B retains concerns with regard to the level of progress. It is recommended that a data cleansing exercise should be undertaken to establish and agree with the ORR the actual number of bridges that are within the SCMI programme, the number of bridges that it is known that will not be achievable by the end of 2007-08 (generally tenanted arches), and therefore the realistic target for completion by this date.</p>	<p>Network Rail have confirmed that CARRs will be developed to include SCMI attribution data.</p> <p><b>Current Status – In Progress</b></p>

Figure 7.6.5 Progress on outstanding recommendations for bridge condition (M8)

## 7.7 Signalling failures (M9)

### Audit scope

- 7.7.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2009, Section 3, Signalling failures (M9), including Table 3.20.
- 7.7.2 This measure reports the total number of signalling failures that cause more than 10 minutes delay on Network Rail's infrastructure (referred to as 'signalling failures').
- 7.7.3 The definition and procedures for this measure are documented in the Network Rail Asset Reporting Manual, documents NR/ARM/M9DF (issue 6) and NR/ARM/M9PR (issue 4) both dated 2 March 2007.
- 7.7.4 The Network Rail organisation structure was changed in September 2008. The Territories and areas no longer exist and were replaced by Routes. The number of delivery units is now reduced from 46 to 40 and each delivery unit is wholly inside a single Route. Centralised Headquarters supports 9 out-based centres aligned to groups of delivery units. The reasoning for this restructuring is to ensure that long term planning and short term technical guidance and faults have equal importance.
- 7.7.5 Audits were undertaken at Network Rail Headquarters, Delivery Units at London Bridge and Edinburgh, and an Integrated Control Centre in York.

### Commentary on reported data

#### *Regulatory target*

- 7.7.6 The regulatory target for signalling failures set in the ORR Access Charges Review 2003 is to maintain the network at or below the baseline level recorded in 2003/04. Failures qualify if they cause more than 10 minutes delay. In numerical terms, the regulatory target is to not exceed 28,098 qualifying signalling failures per annum.
- 7.7.7 In 2008/09, Network Rail reported 19,622 qualifying incidents attributed to signalling failures, which would meet the regulatory target.

#### *Trend*

- 7.7.8 Figure 7.7.1 shows performance 2005/06 to 2008/09. There has been an overall improvement of 30% on signalling failures since the 2003/04 baseline and a more modest 1.5% improvement compared to 2007/08. It can be seen that improvement has occurred in six Routes, namely London North Eastern and Midlands and Continental, South East Anglia, South East Wessex, Scotland and Western. The other three routes namely, London North Western, South East (Kent and Sussex) have seen a slight increase in signalling failures in 2008/09.

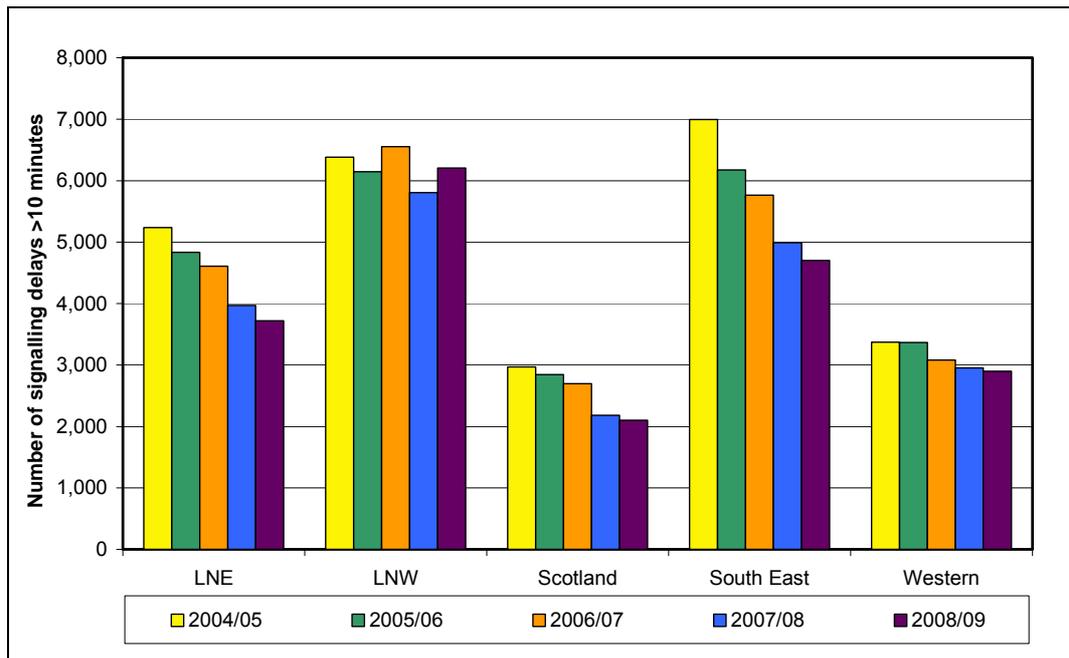


Figure 7.7.1 Number of signalling failures >10 minutes (M9)

7.7.9 Network Rail has attributed the improved performance over the Control Period to the increased installation of LED long range signals and axle counters for train detection, which have considerably reduced the number of signal failures across the network. Our audits at selected Delivery Units demonstrated well established performance monitoring and action plans to deal with problematic assets.

7.7.10 The number of signalling failures per million train kilometres is also presented in the Annual Return. This statistic does not form part of measure M9 nor was it requested by ORR in the agreed Form and Content for the Annual Return. They have not been subject to audit.

### Audit findings

#### *The Integrated Control Centre and Fault Management System (FMS)*

7.7.11 The general organisation structure for fault management within the Integrated Control Centre (ICC) comprises of a Route Control Manager supervising Incident and Support Controllers.

7.7.12 The fault management system is used to record all reported faults. Calls are logged at the ICC by the Incident Controllers and each fault is logged against an asset which in turn determines that locality for the incident. It should be noted that a fault may only be logged against a verified asset. Currently, Network Rail estimates that approximately 2 – 3% of assets are not yet verified. On rare occasions this can cause difficulty in fault allocation. The Incident Controller may use a checklist of questions to obtain the correct fault description or this may be based on experience.

7.7.13 The fault is then allocated a priority from 1 to 5 (where 1 is the highest) and is allocated to a fault team. Incident Controllers also have the support of technical experts for advice on particular issues with faults (e.g. if ‘wrong side’ investigation is required). Incident Controllers manually manage the faults in their areas and they may assign or re-assign the fault teams as required depending on the priority of the faults which arise.

7.7.14 Once a fault is completed the fault team will call the Incident Controller and provide an ‘advice time’, ‘arrival time’, ‘completion time’ and ‘fault close out’ time.

### *The ICC and the Train Running System (TRUST)*

- 7.7.15 The general organisation structure for the train running system in the ICC comprises of a Train Delay Team Leader supervising a team of Train Delay Attributors (TDAs).
- 7.7.16 The Incident Controller verbally notifies the corresponding TDA of faults which cause or may potentially cause a train delay. The TDA will log this information into TRUST as well as logging the FMS number. Allocation of delay to a particular discipline and delay category is based on the Delay Attribution Guide (DAG) and the delay attributor's knowledge of the root cause. As TRUST holds live data for eight days, before it is archived, any updates to an incident, such as reallocation of a delay, are dealt with separately in PMR-PUMPS.
- 7.7.17 At Delivery Units, the Infrastructure Maintenance Performance team review TRUST incidents attributed to signalling and look to re-attribute any which may have been mistakenly allocated. From our visits to Edinburgh and London Bridge it was seen that staff monitor data and identify 'rogue' assets. Such assets are prioritised for renewal or additional maintenance in order to minimise attributable delay.
- 7.7.18 At the end of 2008/09, following the 42-day refresh of the TRUST system, a summary of delays by type, Area and period is extracted. This information is used to produce a table that shows the number of delays over 10 minutes by signalling failures reason codes for each Route, which is then forwarded to the National Rail Reporting Team (NERT)
- 7.7.19 The NERT does not analyse or investigate the data from TRUST. The commentary provided in the Annual Return is based on data from the Fault Management System (FMS), and information from the Signalling Performance Group.

### *Sample checks of data between FMS and TRUST*

- 7.7.20 Sample checks were carried out at the York ICC between the data reported in TRUST and that reported in FMS. Generally the data was correct with the exception of the actual delay minutes recorded in TRUST with those recorded in FMS. Sample checks were also carried out at the Delivery Units with similar results to those at the ICC.

### **Assessment of confidence grade**

- 7.7.21 **Reliability grade.** The documentation and reporting of this measure is exactly the same as last year and is as follows. A documented process has been followed to collect and report this measure. The commentary is based on data from the FMS system, which is separate to TRUST. Steps are being taken in some areas to align TRUST and FMS data. This may result in delays attributed to signalling failures being reduced due to re-attribution of faults. The commentary provided by Network Rail is based on performance reporting and knowledge of the signalling asset performance from a wide range of engineering and maintenance activities. M9 gives a consistent measure across the Routes. We believe that M9 should have a reliability grade of C.
- 7.7.22 **Accuracy grade.** The process remains the same as last year and is defined as follows. We believe that M9 should have an accuracy grade of 2.

### **Audit Statement**

- 7.7.23 We have audited the reliability and accuracy of the available data and commentary, within the Network Rail Annual Return 2009, for signalling failures (M9). We can confirm the data has been collected and reported in accordance with the relevant definition and procedure except for minor shortcomings which have had no material impact. The measure has been assessed as having a confidence grade of C2. The regulatory target for this measure has been met. It should be commended that during audit, the ICC and Delivery Unit staff of Network Rail showed commitment to deal with and reduce faults with a high degree of pride in their achievements.

## Recommendations arising

### *Recommendations essential for the accuracy and/or reliability of the measure*

- 7.7.24 **M9 recommendation 1.** A more reliable system is established for the transfer of data between FMS and TRUST. At the current time this information is only transferred verbally and therefore there is room for error or for omission.
- 7.7.25 **M9 recommendation 2.** A system is put in place to ensure that once the delay minutes have been agreed in TRUST this information is updated in FMS.

### *Observations relating to spreading of best practice and/or improvements to process*

- 7.7.26 **M9 observation 1.** Network Rail's initiative to investigate the use of hand held data input devices for FMS failure cause entry, should lead to more consistency and accuracy within FMS. We encourage that this is further investigated. Despite proposals in 2008 this initiative has not been progressed.

## Progress on outstanding recommendations from previous audit reports

- 7.7.27 We set out below our assessment on the current progress of Network Rail in addressing our outstanding recommendations for signalling failures (M9) from our previous Audits:

Recommendations made	Progress update
<p><b>2005-R23:</b> The accuracy of data reported under this measure should be improved by reviewing the DAG in order to improve the attribution of delay; this review should seek to ensure that – as a matter of principle – attribution to delay categories is based on likely root-cause rather than on the first reported symptoms. This has been a recommendation in previous years.</p>	<p>The introduction of Integrated control centres gives a much greater opportunity of consultation between delay attribution and fault control. This should result in more accurate delay attribution.</p> <p><b>Current Status – Reclassified as an observation</b></p>
<p><b>2005-R24:</b> The accuracy of data reported under this measure should be improved by organising the Area maintenance team or other appropriate person to check the attribution of delays for this measure; this check should confirm that delays attributed to signalling delay categories for this measure were indeed caused by failure of the signalling system, using Network Rail's fault management system (FMS) or other analysis of root-cause. This has been a recommendation in previous years.</p>	<p>Some of the Areas visited over the past few years do have processes in place for challenging delay attribution. It appears to be a matter of priorities within the particular Area. At least one Area visited had a robust process in place for challenging incorrect delay attribution. This had been in place once a vacancy had been filled, during the vacancy period there was no challenge.</p> <p><b>Current Status – Reclassified as an observation</b></p>
<p><b>2007-R23:</b> We recommend that the Fault Management System should be reviewed. This review should cover known deficiencies in respect of FMS verified assets, FMS data entry, FMS data coding, FMS data extraction/analysis. We suggest that analysis of the data-entry process might usefully include a human factors study to assess how the non-technical Controllers interact with the data-entry tree. This will be particularly relevant to any system design for a replacement for FMS.</p>	<p>Network Rail are reviewing and simplifying the data structure for FMS failure causes, which will enable more consistency in FMS failure cause.</p> <p><b>Current Status – In Progress</b></p>

**Figure 7.7.2 Progress on outstanding recommendations for signalling failures (M9)**

## 7.8 Signalling asset condition (M10)

### Audit scope

- 7.8.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2009, Section 3, Signalling Asset Condition (M10), including Tables 3.21 – 3.23.
- 7.8.2 This measure assesses the condition of signalling assets, based on the residual life of equipment in a signalling interlocking area, using a methodology called Signalling Infrastructure Condition Assessment (SICA) which provides a condition grade from 1 to 5 where 1 is good condition and 5 is poor condition. SICA focuses on the interlocking and lineside equipment. Separate assessments are undertaken to assess the condition of all Level Crossings and these are now included in the Annual Return as part of this measure.
- 7.8.3 The definition and procedures for this measure are documented in the Network Rail Asset Reporting Manual, documents NR/ARM/M10DF (issue 6) and NR/ARM/M10PR (issue 6), both dated the 18 February 2008. We were told at the champions meeting the ARM had been updated to reflect the new Network Rail structure. However, a copy of this has not yet been provided to Halcrow
- 7.8.4 Audits were undertaken at Network Rail Headquarters and two Territories: London North Eastern (York) and South East (London Waterloo). One SICA Assessment was attended in the London North Eastern route.

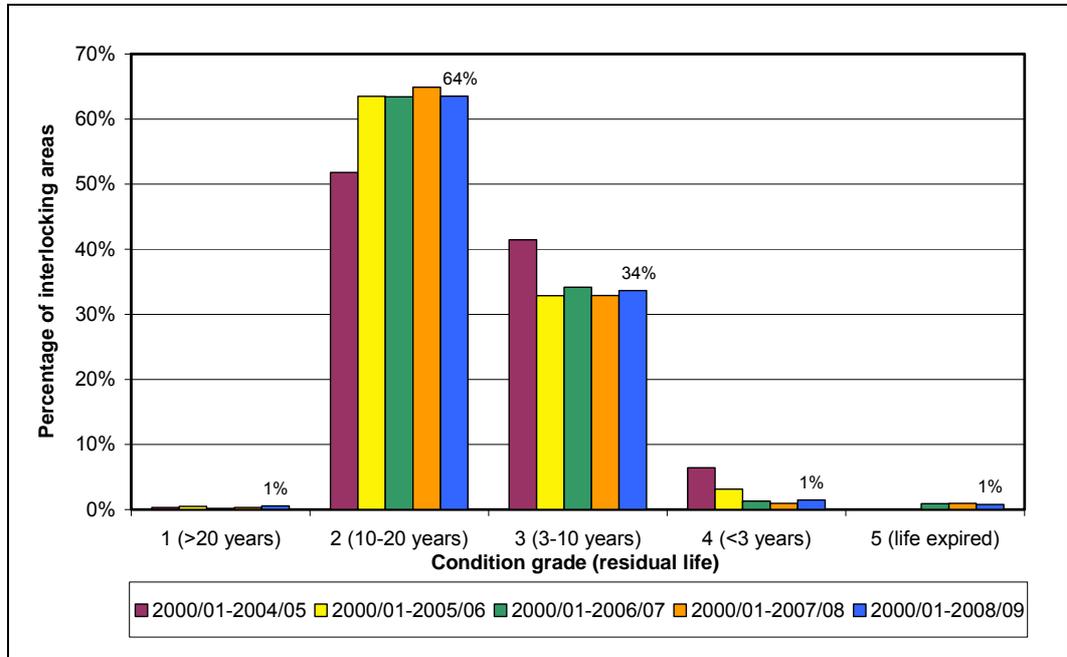
### Commentary on reported data

#### *Regulatory target*

- 7.8.5 The regulatory target for signalling asset condition set in ORR's Access Charges Review 2003 is to maintain the network at or below the baseline level recorded in 2003/04. In numerical terms, the regulatory target is not greater than an average condition grade of 2.5.
- 7.8.6 In 2008/09, Network Rail reported the average condition band to be 2.39, which would meet the regulatory target.

*Trend*

Figure 7.8.1 shows the trend for asset condition of interlockings. Most of reported results are in the condition grade 2 (10 to 20 years remaining life) and 3 (3 to 10 years remaining life). The total population of interlockings stands at 1645 with 1622 having a current assessment grade. The remaining 23 do not currently require a SICA due to being less than 5 years old. Therefore we agree that 100% coverage has been achieved.



**Figure 7.8.1 Average signalling asset condition (M10)**

7.8.7 During the last three years, SICA assessments have been conducted for Level Crossings, and the results have been included in the Annual Return as part of M10. Figure 7.8.2 shows the asset condition for level crossings. Similarly to signalling the majority of the reported results are in condition grade 2 and 3. There is a total population of 1604 level crossings with 14 under 5 years old and 2 outstanding. Therefore we agree that 99.9% coverage has been achieved.

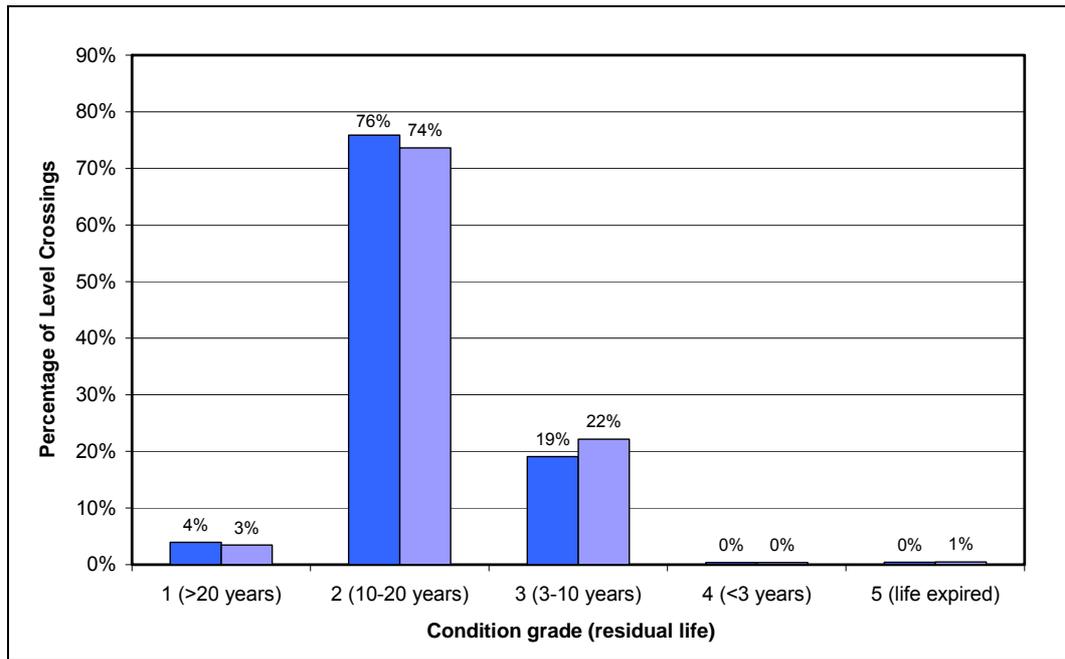


Figure 7.8.2 Average Level Crossing condition for 2007/08 – 2008/09 (M10)

### Audit findings

- 7.8.8 A revised procedure NR/ARM/M10PR Issue 7 was provided, which reflects the recent Network Rail re-organisation.
- 7.8.9 The population of interlockings in each route changes year on year as schemes are commissioned and interlockings replaced. The number of interlockings is clarified by cross checking data from Interlocking Data Cards (IDC) and SIS (SICA Information System).

### SICA Planning

- 7.8.10 The SICA plan is derived from SIS using the earliest ‘next assessment date’ information for outstanding SICA’s. It was noted that some SICA’s showed a ‘negative’ outstanding assessment date (i.e. outstanding from previous years), and it was explained that this was due to projects taking place in that area which would renew or recover the interlocking area.
- 7.8.11 SICA’s are planned on an annual basis from 1<sup>st</sup> January till 31<sup>st</sup> December, which does not correlate with the Annual Return period of 1<sup>st</sup> April till 31<sup>st</sup> March. However, relevant data is available to the compiler of the Annual Return.
- 7.8.12 A copy of the 2008/09 assessment plan was supplied at audit and sample checks confirmed that all planned assessments had been carried out or a satisfactory reason for deferment was supplied. SICA plans for 2009/10 were also satisfactorily viewed at audit, demonstrating a planning process is in place.

### SICA Process

- 7.8.13 SICA assessments are carried out by an engineer from the Principal Renewals and Enhancement Engineer’s team. Condition grades are noted for particular assets in an interlocking area (e.g. relay room, signals, points etc) and this is transferred to the electronic version of SICA before the engineer leaves site. This allows any anomalies to be investigated further without a second site visit.

- 7.8.14 The SICA data generates a SICA report and this is supported by a further Engineer's report which may highlight any particular issues at a site. Reports are reviewed, signed and accepted by a Senior Engineer, and then entered into SIS which produces an overall condition grade for the site. At audit sample checks were carried out to confirm correlation of data between the original SICA and that stored in SIS. These were satisfactory in all cases.
- 7.8.15 An observation of a SICA assessment was carried out at Sudbury MCB Level Crossing, which was also attended by a representative from the ORR. The assessment involved a study of the control panel, signal box, equipment room, and batteries, external equipment and the roadway. Each stage of the assessment and the reason for allocating a particular condition grade to each piece of equipment was explained. Areas of minor concern were also noted and were to be highlighted in the Engineer's report. Once the assessment was complete this was reported to the signaller and a confidence test of the level crossing operation was undertaken. It is our view that the assessor was familiar with both the equipment and the process.
- 7.8.16 As in previous years, the condition grades for infrastructure are amended by Network Rail Headquarters for the purposes of reporting. This is because Network Rail believes that SICA over-estimates asset life. This reflects a precautionary approach but there is no documentary evidence of the degree of adjustment. It was recommended following our 2005/06 audit, this be documented but to date is outstanding.
- 7.8.17 Competence of staff to perform SICA was discussed at audit. Although primary assessors have demonstrated competence this is not documented. NR/L2/SIG/13251 issue 3 (Signalling Infrastructure Condition Assessment (SICA) Handbook) states in section 7, that a register of competent assessors should be held. This was not the case at the sites visited.

### Asset Management

- 7.8.18 The overall condition summary shows that about one third of signalling and one quarter of level crossings will require renewal between 3 and 10 years in the future. It can also be seen that around two thirds of signalling and level crossings will remain serviceable for between 10 and 20 years. This would appear to be manageable and Network Rail has renewal plans going forward beyond Control Period 5.
- 7.8.19 It is noted that over the past few years the number of condition grade 5 (life expired) interlocking areas has risen over years prior. This should be monitored by Network Rail so as not to allow an upward trend.
- 7.8.20 There is an initiative to replace SIS with a new system. This will be named the Signalling Schemes Asset Data Store (SSADS), which will be capable of direct communication with IDC data. This system is currently under development.

### Assessment of confidence grade

- 7.8.21 **Reliability grade.** The SICA assessment process remains unchanged from last year. A documented process has been followed to collect and report this measure. The process has been carried out by competent personnel and adequate documentation is available. We believe that M10 should have a reliability grade of B.
- 7.8.22 **Accuracy grade.** The assessment process for determining remaining asset life is subjective. However, a peer review which provides an independent check on the accuracy of the resulting SICA scores against experience is carried out as part of the overall SICA process. The process for carrying out the assessments and producing condition reports remains robust, but is slightly subjective. The procedures for entry of data are still not documented. There is still no simple check to confirm that data has been entered correctly. We believe that M10 should have an accuracy grade of 2.

## Audit Statement

- 7.8.23 We have audited the reliability and accuracy of the available data and commentary, within Network Rail's Annual Return 2009, for signalling asset condition (M10). We can confirm the data has been collected and reported in accordance with the relevant definition and procedure. The data has been assessed as having a confidence grade of B2. The regulatory target for this measure has been met.

## Recommendations arising

### *Recommendations essential for the accuracy and/or reliability of the measure*

- 7.8.24 **M10 recommendation 1.** For the fifth year in succession we recommend that the practice of applying adjustment factors should be documented.
- 7.8.25 **M10 recommendation 2.** Infrastructure condition to be reported in line with the number of routes which now exist.
- 7.8.26 **M10 recommendation 3.** A register of competent SICA assessors should be held for each route to comply with NR/L2/SIG/13251 issue 3.

### *Observations relating to spreading of best practice and/or improvements to process*

- 7.8.27 **M10 observation 1.** We consider that a simple check be introduced to ensure that the data produced by the assessment process is correctly entered into SIS.

## Progress on outstanding recommendations from previous audit reports

- 7.8.28 We set out below our assessment on the current progress of Network Rail in addressing our outstanding recommendations for the Signalling Asset Condition (M10), from our previous Audits:

Recommendations made	Progress update
<b>2005-R31:</b> We recommend that Western Territory (a) undertake separate assessments for each interlocking and (b) review the impact of undertaking single assessments for signalling control centres on its condition grades.	This recommendation has been address and evidence was sighted during the audits to verify and close this recommendation. <b>Current Status – Actioned and verified</b>
<b>2007-R24:</b> We recommend that the current practice of applying adjustment factors to primary SICA scores should be documented to justify and provide evidence for the level of the adjustment factor. The procedure and definition should be updated to include an explanation of this practice.	The M10 Champion has committed to make this amendment to the definition and procedure, however at the time of writing this report these updates have not been issued. We therefore repeat this recommendation again this year. <b>Current Status – Repeated in Later year</b>
<b>2007-R25:</b> We recommend that a concerted management effort is undertaken to ensure that the SIS data is checked against the interlocking data cards. to ensure that the number of interlockings is correct for 2007/08 and that any differences can be detailed and attributed to new interlockings not yet due for assessment or to assessments not carried out when planned. We recommend that a documented process for making changes to SIS is produced.	Network Rail have made this concerted effort during 2007/08 and this was reflected during our audit visits to the Territories, whom expressed a high level of confidence in the accuracy of the systems. <b>Current Status – Actioned and verified</b>

Recommendations made	Progress update
<p><b>2008 – R32.:</b> For the fourth year in succession, we recommend that the practice of applying adjustment factors to primary SICA scores should be documented. The procedure and definition should be updated to include an explanation of this practice.</p>	

**Figure 7.8.3 Progress on outstanding recommendations for Signalling Asset Condition (M10)**

## 7.9 Traction power incidents causing train delays (M11 & M12)

### Audit Scope

- 7.9.1 These audits were undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2009, Section 3, traction power incidents:
- (a) Alternating current traction power incidents causing train delays (M11), including Table 3.24;
  - (b) Direct current traction power incidents causing train delays (M12), including Table 3.25.
- 7.9.2 These measures report the number of overhead line equipment (OLE) component failures (M11) and conductor rail component failures (M12) that lead to incidents causing more than 500 minutes delay. Both measures exclude incidents caused by defective train equipment, outside parties, vandalism, animals and those arising as a direct result of extreme weather. The measure also excludes incidents caused by failures of other electrification equipment in the power supply system.
- 7.9.3 For Control Period 4 (CP4) the delay minutes for both M11 and M12 is being changed to incidents causing more than 300 minutes delay.
- 7.9.4 The definitions and procedure for these measures are documented in the Network Rail Asset Reporting Manual (ARM) documents:
- (a) NR/ARM/M11DF, February 2004, (issue 3)
  - (b) NR/ARM/M12DF, February 2004, (issue 3)
  - (c) NR/ARM/M11PR, February 2005 (issue 4)
- 7.9.5 These measures have a common procedure and data collection process; however due to the changes in the Network Rail organisation structure that took place in September 2009 we have undertaken process audits for these audits at separate locations based on the locations of the a.c. and d.c. traction power teams, but we have reported on these measures together. Audits were undertaken at Network Rail Headquarters and delivery units in Woking, East Croydon, Birmingham, Glasgow and York.

### Commentary on reported data

#### *Regulatory target*

- 7.9.6 The regulatory target for traction power failures set in ORR's Access Charges Review 2003 was to maintain the network at or below the baseline level recorded in 2001/02.
- 7.9.7 **M11.** In numerical terms, the regulatory target is to not exceed 107 OLE component failures causing train delay. For 2008/09, the result reported by Network Rail was 66, which would meet the regulatory target.
- 7.9.8 **M12.** In numerical terms, the regulatory target is to not exceed 30 conductor rail component failures causing train delay. For 2008/09, the result reported by Network Rail was 14, which would meet the regulatory target.

#### *Trend*

- 7.9.9 Figure 7.9.1 shows the number of reportable traction power incidents for 2008/09 has seen an upward trend from 2007/08. The results for 2008/09 are increases of 5% for d.c. and 36% for a.c. There has been an increase in a.c. faults in England and Wales and a decrease in Scotland.

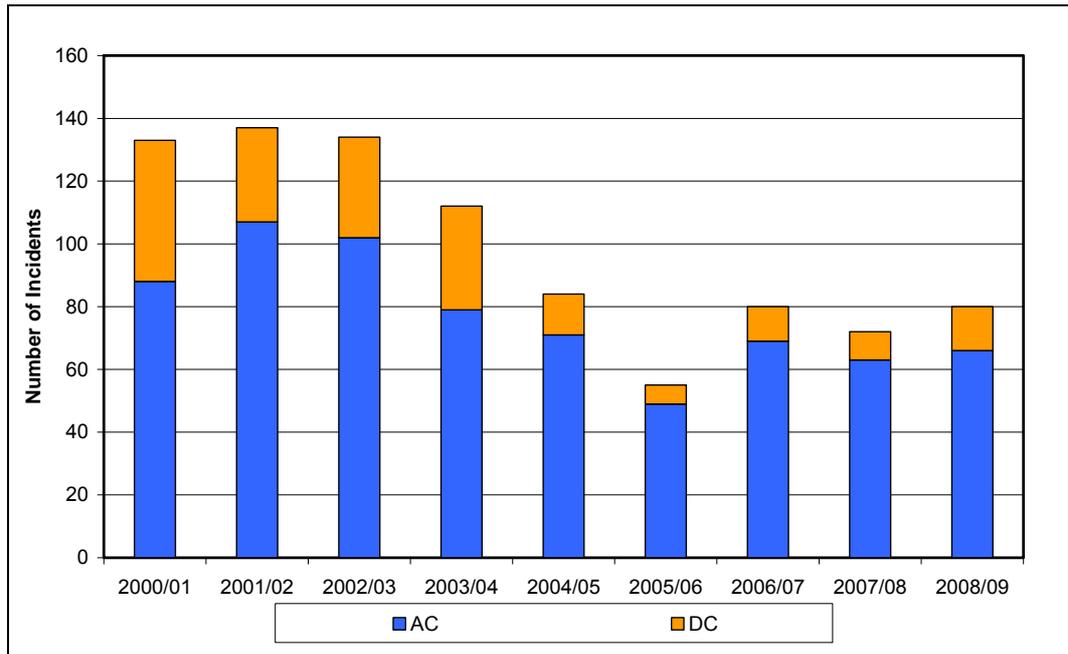


Figure 7.9.1 Traction power incidents causing over 500 train delay minutes (M11 & M12)

7.9.10 Figure 7.9.2 shows that despite the percentage of incidents having increased in 2008/09, London North Eastern (including Midland and Continental) and Scotland have seen a decrease in incidents. London North Western, Western, South East (Sussex, Kent and Anglia) Routes have seen an increase in incidents. The South East (Wessex Route) has remained unchanged.

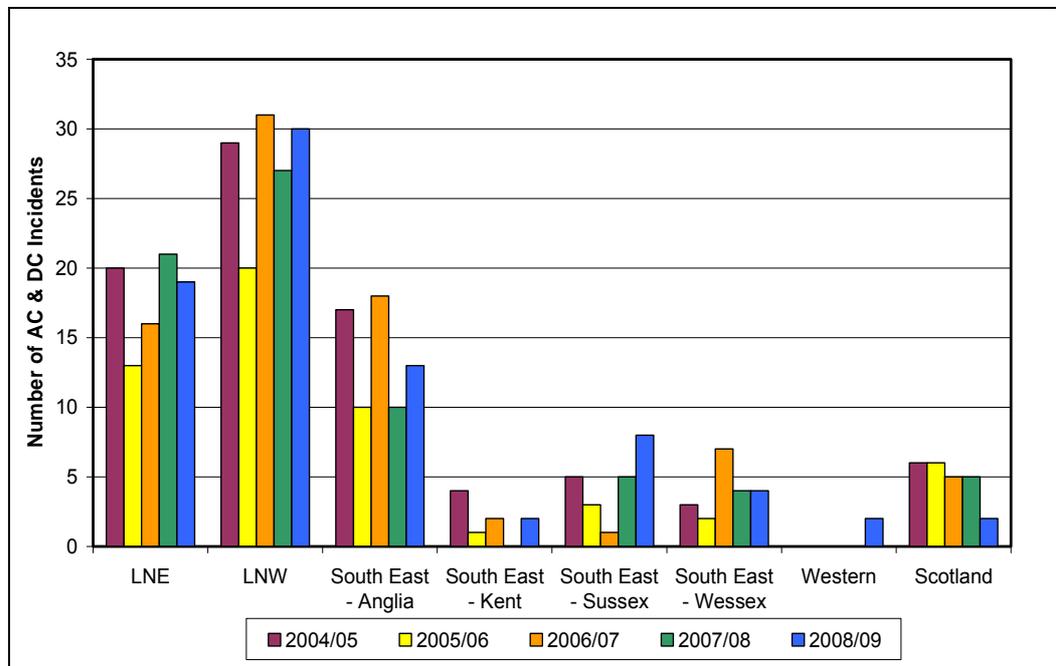


Figure 7.9.2 Number of a.c. and d.c. Incidents causing over 500 minutes delay (M11 & M12)

- 7.9.11 Network Rail provided reasons for the increase in incidents in the West Coast South area as being due to the large volume of construction works associated with the WCML 125mph upgrade, the increased levels of train running and the sustained period of cold weather in December 2008 and January 2009.
- 7.9.12 Increased failures in the South East were due to construction works associated with the renewal of the OLE between Liverpool St and Chelmsford, re-call of Unimog 400 maintenance for a safety modification and a sustained period of cold weather.
- 7.9.13 The increase in failures in Kent and Sussex has been due to Introduction of new trains and increased levels of train running.
- 7.9.14 For Wessex Network Rail stated that 3 of the 4 failures were due to the poor workmanship at the Portsmouth Harbour installation project.
- 7.9.15 Figure 7.9.3 compares the incidents for 2007/08 and 2008/09 for each Route by failure analysis category given in the Headquarters spreadsheet. This figure supports the rationale given for the trends above.

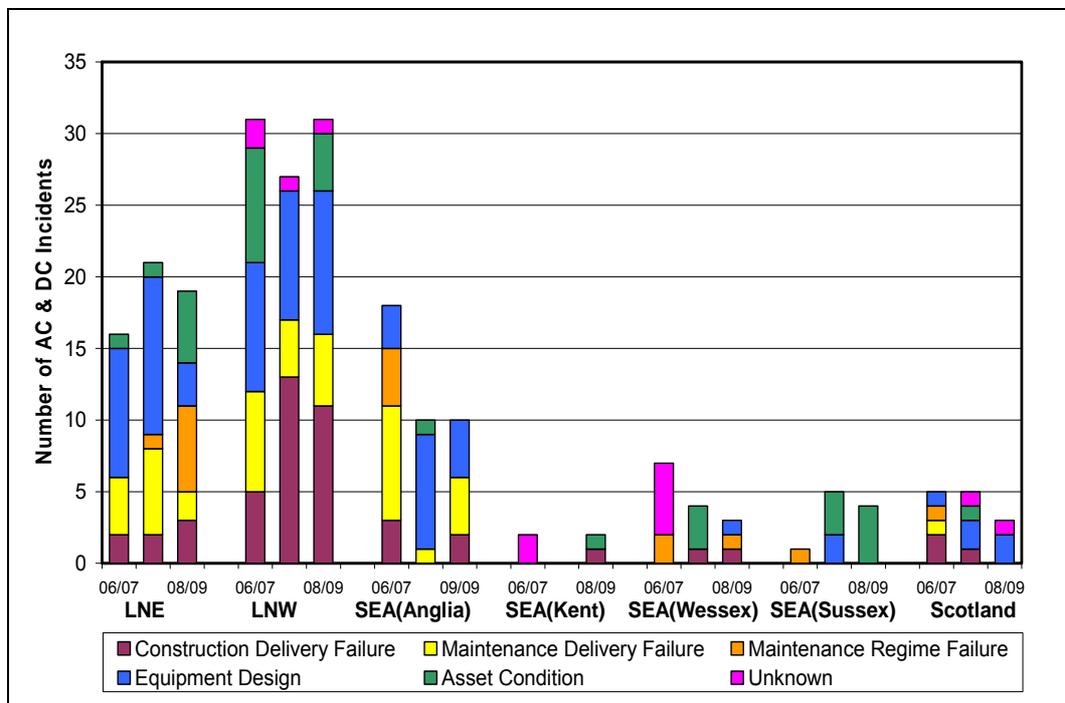


Figure 7.9.3 Comparison of a.c. and d.c. Incidents by Failure Analysis Category (M11 & M12)

## Audit findings

### Process

- 7.9.16 The Network Rail organisation structure was changed in September 2008 and this has resulted in the creation of the Infrastructure Maintenance Performance Manager (IMPM); there are 9 IMPMs, one per route.
- 7.9.17 The IMPMs will send the National Incident Report spreadsheet to the Area Performance and Assurance Engineer, make any additions, corrections and commentary (if required) and return this spreadsheet to the National Engineering Reporting Team (NERT).
- 7.9.18 The NERT team holds the master spreadsheet and will update this spreadsheet with to take account of the changes made by the IMPMs. The same process will be followed each period. At the end of the financial year, the final spreadsheet is sent to the IMPMs to allow for final review prior to the information being used in the Network Rail Annual Return.

### Accuracy of reported data

- 7.9.19 We undertook a 100% desktop check of traction power incidents causing greater than 500 minutes of delay using the Headquarters spreadsheet, which included the review of details provided for incidents that were both accepted or rejected incidents by the Territory E&P Engineers that fell within the definition of the M11 and M12 measures.
- 7.9.20 During the audit at each delivery unit, we also selected a sample of 5 incidents per delivery unit that had been accepted, rejected or were still under investigation and asked for explanation about the incident and reasons for rejection. We found for all the selected incidents the Area Performance and Assurance Engineers were able to justify the reasoning behind the categorisation of each incident and provide evidence where required. However it was noted that this information was not always available at the process audit meeting with the IMPMs and had to be sought after the meetings at Birmingham, East Croydon and Woking. In York and Glasgow this information and review was able to be undertaken at the process review meeting, with Glasgow being particularly commendable for the information available to the meeting.
- 7.9.21 A check was carried out on the data that was provided in the Network Rail Annual Return against the data provided by the IMPM and Territory Engineers to the NERT team. The following operating routes: Scotland, London North West, London North East, Kent and Sussex were checked and no errors were found.
- 7.9.22 Using the year's final delay information we have also cross-checked the number of minutes given on the Headquarters spreadsheet for those incidents that had been accepted and those that had been rejected due to being "less than 500 mins". Of the 78 incidents accepted we found that this was consistent with the data provided by the IMPMs.

### Assessment of confidence grade

- 7.9.23 **Reliability grade.** The definitions for these measures are clearly documented; however the procedure has not been updated following the re-organisation in Network Rail in September 2009. The process flow chart therefore does not contain the correct procedure or job descriptions. The process outlined by the delivery units was also not consistent. The process of correctly identifying the root cause of incidents attributed to overhead line or conductor rail components is not a simple process and the number of minutes attributed to a delay is known to be a subjective process. We believe that M11 and M12 should have a reliability grade of B.
- 7.9.24 **Accuracy grade (M11).** Our samples found the data was recorded in the Headquarters spreadsheet was accurate and correlated to that provided by the IMPMs and the reasons for rejected incidents were valid. We believe that M11 should have an accuracy grade of 2.
- 7.9.25 **Accuracy grade (M12).** The number of conductor rail component incidents reported for M12 is insufficiently large to support a numeric assessment of the accuracy of this measure. Our samples found the data was recorded in the Headquarters spreadsheet was accurate and correlated to that provided by the IMPMs and the reasons for rejected incidents were valid. The accuracy grade for M12 is therefore 'X' to indicate that an accuracy grade cannot be properly described.

### Audit Statements

- 7.9.26 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2009 for alternating current traction power incidents causing train delays (M11). We can confirm the data has been collected and reported in accordance with the relevant definition and procedure. The data has been assessed as having a confidence grade of B2. The regulatory target for this measure has been met.

7.9.27 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2009 for direct current traction power incidents causing train delays (M12). We can confirm the data has been collected and reported in accordance with the relevant definition and procedure. The data has been assessed as having a confidence grade of BX. The regulatory target for this measure has been met.

**Recommendations arising**

*Recommendations essential for the accuracy and/or reliability of the measure*

- 7.9.28 **M11 & M12 recommendation 1.** Following discussions with the IMPMs it was agreed that the IMPMs role is nothing more than a mailbox and therefore this role adds nothing to the process. Therefore it is recommended that the IMPMs take ownership of this data and a process to valid this data implemented.
- 7.9.29 **M11 & M12 recommendation 2.** The spreadsheet that is sent to the IMPMs is rather complex and following discussions with the IMPMs it became evident that there was no clear work instruction on how to populate the spreadsheet. It is therefore recommended that a work instruction is developed to ensure that the spreadsheet is completed in a standardised manner.
- 7.9.30 **M11 & M12 recommendation 3.** It is recommended that procedure (NR/ARM/M11PR, February 2005 (issue 4) is updated to reflect the change process, in organisation and the creation on new job titles in Network Rail.

*Observations relating to spreading of best practice and/or improvements to process*

- 7.9.31 **M11 & M12 observation 1.** We have been advised by the Process and Assurance Engineers that there are some significant incidents that do not cause substantial delay minutes and therefore are not reportable, it is suggested that these issues be summarised in the Network Rail Annual Return.
- 7.9.32 **M11 & M12 observation 2.** We have some concern that the system of recording failures based on delay minutes (presently 500 minutes, to be revised to 300 minutes) may not pick up all significant system faults. It is possible that a generic component defect may be a serious ongoing issue without creating any failure exceeding the target minutes.

**Progress on outstanding recommendations from previous audit reports**

7.9.33 We set out below our assessment on the current progress of Network Rail in addressing our outstanding recommendations for traction power incidents from our previous Audits:

<b>Recommendations made</b>	<b>Progress update</b>
<b>2005-R32:</b> We recommend that this measure [M11 or M12] is expanded to cover DC overhead line incidents.	Network Rail have agreed with this recommendation and will make a amendment to the ARM in the next update  <b>Current status – In Progress</b>

**Figure 7.9.4 Progress on outstanding recommendations for Traction power incidents (M11 & M12)**

## 7.10 Electrification condition – a.c. traction feeder stations & track sectioning points (M13)

### Audit scope

- 7.10.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2009, Section 3, Electrification condition – a.c traction feeder stations and track sectioning points (M13), including Table 3.26.
- 7.10.2 This is a condition measure for alternating current (a.c) traction feeder stations (FSs) and track sectioning locations (TSLs), using a questionnaire to provide a condition grade from 1 to 5, where 1 is good condition and 5 is poor condition. The questionnaire, which is completed during the normal maintenance inspection, is based on visual inspection and the age, robustness of design, maintenance/refurbishment history and operational performance of the 25kV switchgear.
- 7.10.3 During 2007/08 Network Rail had undertaken a review of this measure and had trialled a new questionnaire via an alternative collection process in two pilot Areas, West Coast South in London North Western Territory and North Eastern in London North Eastern. New work instructions and processes are currently in the Network Rail standards approval system and therefore there has been no new data collected in 2008/09.
- 7.10.4 Network Rail have instead undertaken a desktop study using existing information to develop a baseline for CP4. To verify the data used in this process a sample of recent inspection reports for 53 a.c substations was analysed, these reports being obtained from inspections made by Headquarters or Maintenance staff over the last two years. Halcrow witnessed some of these inspections as described below. The sites visited were Kirkstall FS, Armley, Leeds TSL, Ardsley FS and Marsh Lane TSL.
- 7.10.5 The definition and procedures for this measure are documented in the Network Rail Asset Reporting Manual, documents NR/ARM/M13DF (issue 4) and NR/ARM/13PR (issue 8).

### Commentary on reported data

#### *Regulatory target*

- 7.10.6 The regulatory target for electrification condition set in ORR's Access Charges Review 2003 was to maintain the network at or below the baseline level recorded in 2001/02. In numerical terms, the regulatory target was an average condition score of not greater than 2.1.
- 7.10.7 2007/08 was the first year that data for the new measure was collected therefore a comparison can be made to some extent between the 2008/09 and 2007/08 scores. However Network Rail believes that the data collected in 2008/09 as part of the base lining exercise is more representative of the asset condition due to the size and representation of the sample set taken in 2008/09.
- 7.10.8 Network Rail believes that in 2007/08 a disproportionate number of the now obsolescent K11 switchgear locations were assessed. This asset type is older than the national average and due for renewal, therefore producing a higher score.
- 7.10.9 It should be noted that the 2007/08 and 2008/09 measure cannot be compared with the measure for 2001/02 regulatory target due to rationalisation and improvement of the data collection process.

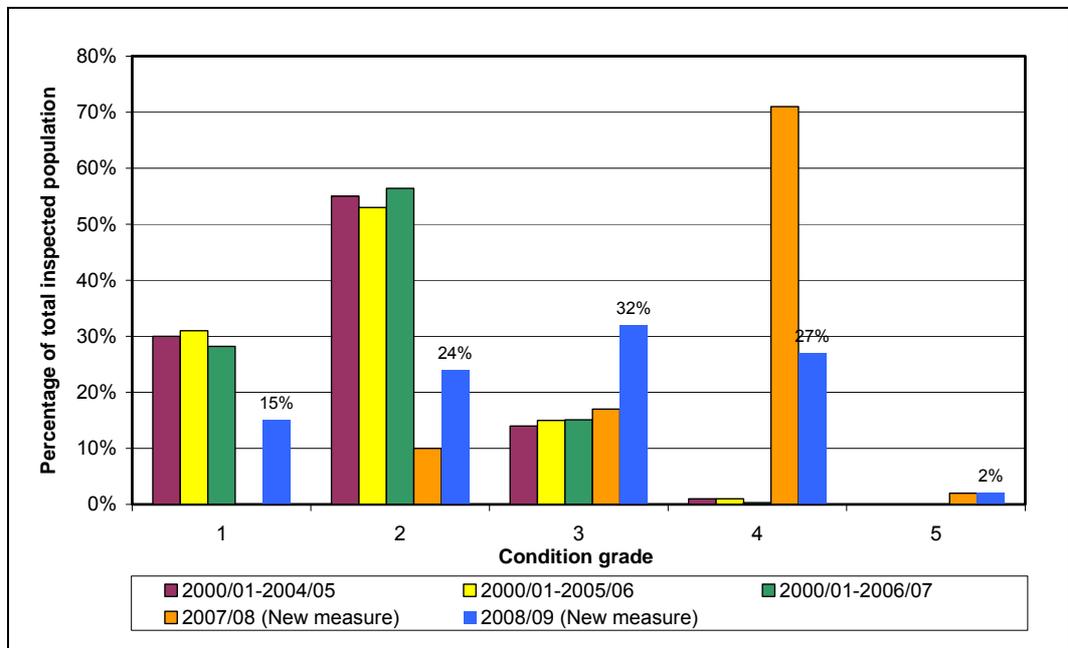
#### *Trend*

- 7.10.10 Figure 7.10.1 shows that the average score obtained using the new M13 measure is not comparable to the relatively steady trend of the previous inspection method.

Period	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Average Score using previous process	1.9	1.87	1.85	1.88	-	-
Average Score using new process	-	-	-	-	3.53	2.78

**Figure 7.10.1 Average condition – a.c traction feeder stations & track sectioning points (M13)**

7.10.11 The percentage of a.c traction feeder stations & track sectioning points achieving grades 1-5 (either by the old or new measures) across the entire network in the last 5 years is shown in Figure 7.10.2. It can be seen that the majority of the scores are now in grade 2, 3 and 4.



**Figure 7.10.2 Condition a.c traction feeder stations & track sectioning points (M13)**

## Audit findings

### Base lining process

7.10.12 The data used to develop the baseline score for Control Period 4 (CP4) is taken from the following sources:

- Results from previous years, including the trials undertaken in 2007/08
- Site inspections by HQ Engineering and;
- Knowledge of identified characteristics of different makes of equipment

- 7.10.13 Spreadsheets have been developed listing each substation site for the a.c networks and giving scores for the various buildings and plant assets at each of these substations. Where an inspection report dated within the last two years was available (i.e. for the 53 sites as mentioned above), this score has been entered into the spreadsheet, otherwise the score has been recorded based on a desktop assessment.
- 7.10.14 The a.c substations are generally comprised of modular equipment to standard patterns, largely determined by when the route first involved electrification. As such there is a high degree of homogeneity in the network and Network Rail have high confidence in the extrapolation of the condition result from site to site based on previous experience and the result of the sample site inspections undertaken in 2009. The a.c stations are relatively simple in construction with only 7 items needing to be scored at each site.

#### *Analysis of Base lining results*

- 7.10.15 The a.c reporting includes 298 sites nationwide, 53 of these (18% of the total) had been inspected as part of the 2007/08 trial or as part of the 2009 sample inspections carried out by Network Rail Engineering at HQ. The remaining 245 sites have been assessed using the baseline condition score i.e. by extrapolation of the generic results. The 53 inspected sites included a range of most of the installed switchgear types although it was noted that the majority were of the older K11 type bulk oil switchgear which is in the process of being phased out due to its age and condition, hence producing poorer scores for relevant items.
- 7.10.16 The derivation of the baseline scoring system for the non-inspected sites was reviewed. The a.c inspection items have been categorised by location and equipment type and had a baseline score assigned to them. The baseline score was used to populate the overall spreadsheet where no recent inspection data was available. The finalised spreadsheet has been base lined as at 18th April 2009.

#### *Site inspections*

- 7.10.17 Together with Network Rail, we visited a number of sites in the course of producing this report, in order to witness the application of the scoring questionnaire and verify that the recorded scores were based on a sound system of reasoning. The sites visited were Kirkstall FS, Armley, Leeds TSL, Ardsley FS and Marsh Lane TSL. We were satisfied that the scores were sensibly reported and also that the current questionnaire can effectively capture the data necessary to assess each asset condition.

#### *Accuracy of reported data*

- 7.10.18 There was no data collected against M13 this year due to the revised process not being formally approved and issued by Network Rail However a baselining exercise was carried out to obtain the baseline for Control Period (CP4). This included a sample inspection of 54 of the 298 locations (18%).

#### **Assessment of confidence grade**

- 7.10.19 **Reliability grade.** There was no data collected against M13 this year due to the revised process not being formally approved and issued by Network Rail However a baselining exercise was carried out to obtain for baseline for Control Period (CP4). As this exercise has not been carried out in accordance with the M13 process we cannot assignment a reliability grade to this measure, therefore we believe that M13 should receive a reliability grade of X.
- 7.10.20 **Accuracy grade.** Our comment for the accuracy grade for M13 is as above in 1.1.18. Therefore we believe that M13 should receive an accuracy grade of X.

## Audit Statement

7.10.21 We have not been able to audit the reliability and accuracy of data for M13 as stated in 7.10.1 and 7.10.2 above. We can however comment on the reliability and accuracy of the data used to compile the baseline. We believe that the data assessed is reliable and accurate and therefore baseline is a fair representation of the overall asset condition.

## Recommendations arising

### *Recommendations essential for the accuracy and/or reliability of the measure*

7.10.22 We have no recommendations for this measure.

### *Observations relating to spreading of best practice and/or improvements to process*

7.10.23 We have no observations for this measure.

## Progress on outstanding recommendations from previous audit reports

7.10.24 We set out below our assessment on the current progress of Network Rail in addressing our outstanding recommendations for Electrification condition – a.c traction feeder stations and track sectioning points (M13) from our previous Audits:

Recommendations made	Progress update
<b>2005-R33:</b> We recommend that the M13-ECAP questionnaire should be reviewed in 2005/06; this would enable a new questionnaire to be used in 2006/07 once the population has been assessed using the current questionnaire. This review should incorporate appropriate Territory and Area personnel and the specific recommendations made by Reporter A in previous years.	As part of the development of the new measure the questionnaire has been reviewed and updated in association with maintenance. <b>Current Status – Actioned and verified</b>
<b>2005-R34:</b> We recommend the condition assessments for this measure are undertaken at the four-yearly inspection not at specific five-yearly site visits.	As the new method of collection aligns with the maintenance cycles M13 data will be collected more frequently (every 2-4 years). <b>Current Status – Actioned and verified</b>
<b>2005-R35:</b> Similar to previous years, we recommend that one or more measures for reporting on the condition of plant are developed by Network Rail and incorporated in the Annual Return.	A measure for point heaters has been developed and is being collected. However, this will not be introduced as an Annual Return measure for CP4. <b>Current Status – Withdrawn</b>
<b>2006-R43:</b> We recommend that Network Rail should develop and roll-out a training course and associated competence management system for the M13-ECAP process. This should include a process for mentoring and checking assessments.	This has been address as part of the development of the new measure. The new measure has more quantitative questions and a detailed guidance has been developed. <b>Current Status – Actioned and verified</b>
<b>2007-R26:</b> We recommend that the dataset of condition scores should be recalculated using natural rounding now that 100% of the population has been assessed.	The new measure is using natural rounding <b>Current Status – Actioned and verified</b>

**Figure 7.10.3 Progress on outstanding recommendations for Electrification condition – a.c traction feeder stations and track sectioning points (M13)**

## 7.11 Electrification condition – d.c. substations (M14)

### Audit scope

- 7.11.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2009, Section 3, Electrification condition – d.c. substations (M14), including Table 3.27.
- 7.11.2 This is a condition measure for direct current (d.c) substations, using a questionnaire to provide a condition grade from 1 to 5, where 1 is good condition and 5 is poor condition. The questionnaire, which is completed during the normal maintenance inspection, is based on visual inspection and the age, robustness of design, maintenance/refurbishment history and operational performance of the high voltage switchgear, rectifier transformers, rectifiers and d.c switchgear.
- 7.11.3 During 2007/08 Network Rail had undertaken a review of this measure and have trialled a new questionnaire via an alternative collection process in two pilot Areas, West Coast South in London North Western Territory and North Eastern in London North Eastern. New work instructions and processes are currently in the Network Rail standards approval system and therefore there has been no new data collected in 2008/09.
- 7.11.4 Network Rail has instead undertaken a desktop study using existing information to develop a baseline for CP4. To verify the data used in this process a sample of recent inspection reports for 70 d.c substations was analysed, these reports being obtained from inspections made by Headquarters or Maintenance staff over the last two years. Halcrow witnessed some of these inspections as described below.
- 7.11.5 The definition and procedure for this measure are documented in the Network Rail Asset Reporting Manual, documents NR/ARM/M14DF (issue 4) and NR/ARM/14PR (issue 8).

### Commentary on reported data

#### *Regulatory target*

- 7.11.6 The regulatory target for electrification condition set in ORR's Access Charges Review 2003 was to maintain the network at or below the baseline level recorded in 2001/02. In numerical terms, the regulatory target was an average condition score of not greater than 2.3.
- 7.11.7 2007/08 was the first year that data for the new measure was collected therefore a comparison can be made to some extent between the 2008/09 and 2007/08 scores. However Network Rail believes that the data collected in 2008/09 as part of the baselining exercise is more representative of the asset condition due to the size and representation of the sample set taken in 2008/09.
- 7.11.8 Network Rail explained that in 2007/08 only 1% of the d.c asset population was sampled, the d.c asset population is already a very small sample base. In 2008/09 10% of the assets were assessed and therefore Network Rail believe that the 2008/09 score is more representative of the asset spread.
- 7.11.9 It should be noted that the 2007/08 and 2008/09 measure cannot be compared with the measure for 2001/02 regulatory target due to the rationalisation and improvement of the data collection process.

#### *Trend*

- 7.11.10 Table 7.11.1 shows that the average score obtained using the new M14 measure is not comparable to the relatively steady trend of the previous inspection method.

7.11.11

Period	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Average Score using previous measure	1.9	1.82	1.78	1.64	-	-
Average Score using new measure	-	-	-	-	3.61	2.53

Figure 7.11.1 Average condition of d.c. sub-stations (M14)

7.11.12 The percentage of d.c. sub-stations achieving grades 1-5 (either by the old or new measures) across the entire network in the last 5 years is shown in. Figure 7.11.2. It can be seen that most of the scores are in grades 2 and 3

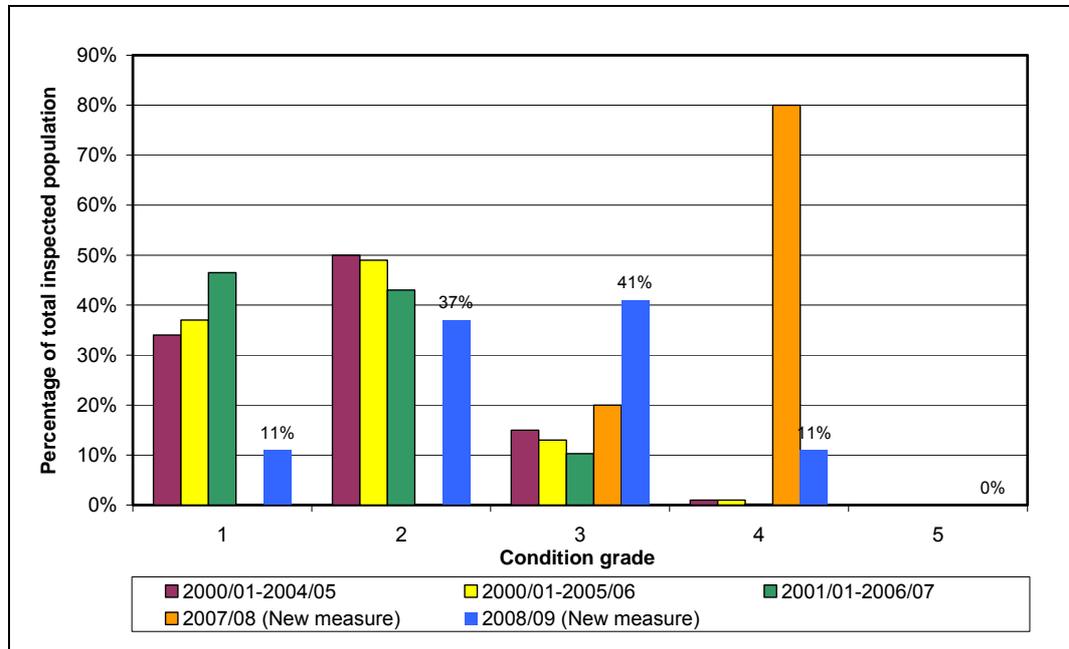


Figure 7.11.2 Average condition grade for d.c sub-stations (M14)

## Audit findings

### Benchmarking process

7.11.13 The data used to develop the baseline score for Control Period 4 (CP4) is taken from the following sources:

- Results from previous years, including the trials undertaken in 2007/08
- Site inspections by HQ Engineering and;
- Knowledge of identified characteristics of different makes of equipment

7.11.14 Spreadsheets have been developed listing each substation site for the d.c networks and giving scores for the various buildings and plant assets at each of these substations. For the 70 sampled locations with an inspection report dated within the last two years, the measured score has been entered into the spreadsheet and the scored locations on the spreadsheet have been used to derive the baseline condition scores.

- 7.11.15 The d.c substations are complex in comparison to the a.c substations in terms of the number of items that need to be scored and in a lot of cases the sites include a varied mix of apparatus of different makes and widely differing dates of manufacture. This is expected given the long lifetime of the majority of the d.c sites. The inspection form for the d.c substations include up to 16 items to be scored, significantly more than the a.c substations due to the complexity.
- 7.11.16 Inspection findings from previous years have been used as part of the baselining exercise, however these were based on the original ECAP questionnaire, which had significant differences to the new rationalised form, and therefore a high degree of expert interpretation was required in order to derive equivalent scores for the new questionnaire. We have reviewed the process involved and consider that this has been carried out competently and diligently.

#### *Analysis of benchmarking results*

- 7.11.17 There are 668 d.c substations sites and the desktop baseline exercise has focused on 70 of these (10% of the total). This sample size is considered satisfactory for this exercise and the sample selected included a reasonable representation of the installed equipment.
- 7.11.18 Of the 70 d.c substations used to produce the baseline, 17 have been inspected using the new work instruction in the last 2 years as part of the 2007/08 trials or by Network Rail Headquarters Engineering. For the remaining 53 sites, ECAP questionnaires completed in 2005-2007 were reviewed and interpreted by Network Rail Headquarter Engineering to complete the benchmarking exercise.
- 7.11.19 Further cross checks were carried out of the scores for the 17 sites inspected under the new instruction in comparison to those for the 53 sites inspected under the previous instruction. However due to the wide variation in equipment amongst the locations a meaningful comparison of the scores was unable to be made.
- 7.11.20 The baseline has been produced from the d.c substation spreadsheet and finalised at 18<sup>th</sup> April 2009.

#### *Site inspections*

- 7.11.21 Together with Network Rail, we visited a number of sites in the course of producing this report, in order to witness the application of the scoring questionnaire and verify that the recorded scores were based on a sound system of reasoning. The sites visited were New Beckenham, Grove Park, Bexleyheath and Chelsfield. We were satisfied that the scores were sensibly reported and also that the current questionnaire can effectively capture the data necessary to assess each asset condition.

#### *Accuracy of reported data*

- 7.11.22 There was no data collected against M14 this year due to the revised process not being formally approved and issued by Network Rail. However a baselining exercise was carried out to obtain for baseline for Control Period (CP4). This included a sample inspection of 70 of 668 locations (10%).

#### **Assessment of confidence grade**

- 7.11.23 **Reliability grade.** There was no data collected against M14 this year due to the revised process not being formally approved and issued by Network Rail. However a baselining exercise was carried out to obtain for baseline for Control Period (CP4). As this exercise has not been carried out in accordance with the M14 process we cannot assign a reliability grade to this measure, therefore we believe that M14 should receive a reliability grade of X.
- 7.11.24 **Accuracy grade.** Our comment for the accuracy grade for M14 is as above in 1.1.18. Therefore we believe that M14 should receive an accuracy grade of X.

## Audit Statement

7.11.25 We have not been able to audit the reliability and accuracy of data for M14 as stated in 7.11.1 and 7.11.2 above. We can however comment on the reliability and accuracy of the data used to compile the baseline. We believe that the data assessed is reliable and accurate and therefore baseline is a fair representation of the overall asset condition.

## Recommendations arising

### *Recommendations essential for the accuracy and/or reliability of the measure*

7.11.26 We have no recommendations for this measure.

### *Observations relating to spreading of best practice and/or improvements to process*

7.11.27 We have no observations for this measure.

## Progress on outstanding recommendations from previous audit reports

7.11.28 We set out below our assessment on the current progress of Network Rail in addressing our outstanding recommendations for Electrification condition – d.c. substations (M14) from our previous Audits:

Recommendations made	Progress update
<b>2006-R45:</b> We recommend Network Rail's planned review of the M14-ECAP questionnaire should incorporate appropriate Territory and Area personnel and the specific recommendations made by Reporter A in previous years, including inclusion of track paralleling huts and HV cables in the assessment process.	As part of the development of the new measure the questionnaire has been reviewed and updated in association with maintenance. <b>Current Status – Actioned and verified</b>
<b>2006-R46:</b> We recommend that Network Rail should develop and roll-out a training course and associated competence management system for the M14-ECAP process. This should include a process for mentoring and checking assessments.	This has been address as part of the development of the new measure. The new measure has more quantitative questions and a detailed guidance has been developed. <b>Current Status – Actioned and verified</b>
<b>2007-R27:</b> We recommend that the dataset of condition scores should be recalculated using natural rounding now that 100% of the population has been assessed.	The new measure is using natural rounding <b>Current Status – Actioned and verified</b>

**Figure 7.11.3 Progress on outstanding recommendations for Electrification condition – d.c substations (M14)**

## 7.12 Electrification condition – a.c. traction contact systems (M15)

### Audit scope

- 7.12.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2009, Section 3, Electrification condition – a.c traction contact systems (M15), including Tables 3.28 – 3.29.
- 7.12.2 This is a condition measure for a.c traction contact systems, using a questionnaire to provide a condition grade from 1 to 5, where 1 is good condition and 5 is poor condition. The questionnaire, which will be completed during the normal maintenance inspection, following the completion of the trail, is based on physical wear measurement of contact wire and visual inspection of key components including contact and catenary wires, registration assemblies and structures; the measure excludes track related earthing, bonding and traction return circuits.
- 7.12.3 In 2007/08 Network Rail began a trial of the new questionnaire via an alternative collection process in two pilot Areas, West Coast South in London North Western Territory and North Eastern in London North Eastern. This trial is now being managed by the East Coast Mainline Project team. However it is the intention that following the trial this process will be handed to the maintenance team.
- 7.12.4 The definition and procedures for this measure are documented in the Network Rail Asset Reporting Manual, documents NR/ARM/M15DF (issue 5) and NR/ARM/M15PR (issue 6).

### Commentary on reported data

- 7.12.5 The regulatory target for electrification condition set in ORR's Access Charges Review 2003 was to maintain the network at or below the baseline level recorded in 2001/02. In numerical terms, the regulatory target was an average condition score of not greater than 1.8.
- 7.12.6 The extrapolated average condition score reported by Network Rail for year-end 2008/09 was 1.6, a slight improvement from last year of 1.7, which would meet the regulatory target.

### Trend

- 7.12.7 Figure 7.12.1 and Figure 7.12.2 show the trend for average asset condition of a.c. contact systems has been largely static over the last five years albeit with a larger proportion of assets being surveyed.

Period	00/01-04/05	00/01-05/06	00/01-06/07	00/01-07/08	00/01-08/09
Average Condition Score	1.7	1.7	1.7	1.7	1.6
% of Asset Surveyed	17%	21%	27%	30%	33%

Figure 7.12.1 a.c traction contact systems (M15)

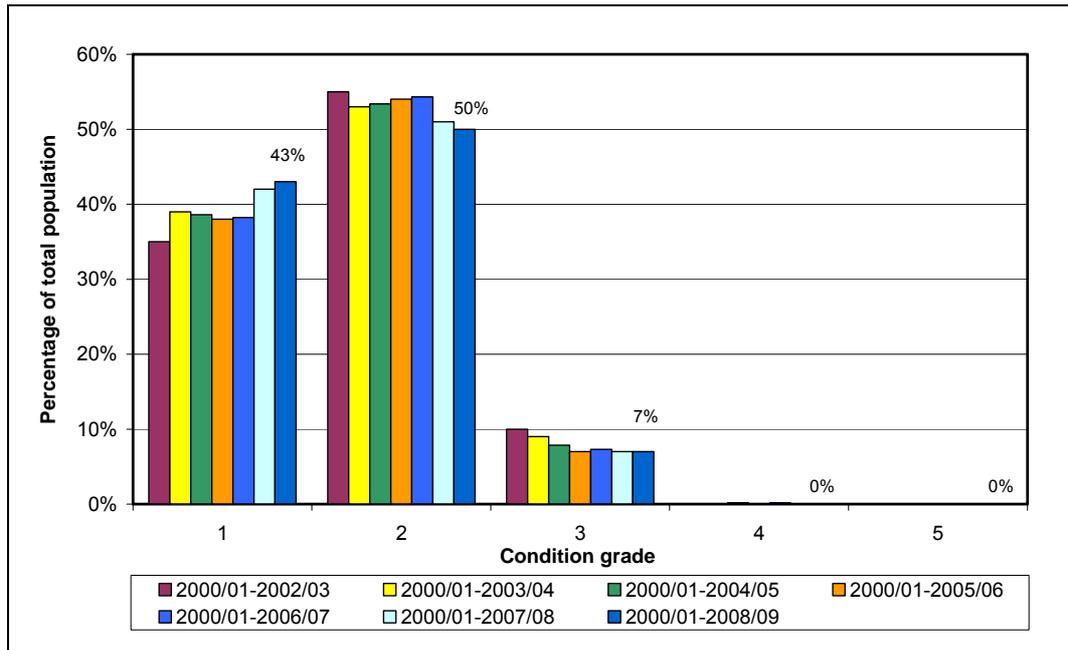


Figure 7.12.2 Average condition grade of a.c traction contact systems (M15)

## Audit findings

### Trial Update

- 7.12.8 Following the re-organisation in Network Rail, the trial of the new questionnaire and process is now being managed by the East Coast Mainline team. The intention is that once the trial is completed this process will be managed by the maintenance team.
- 7.12.9 A dilapidation survey has started and will be completed over the next 2 years; there is one group of contractors and a renewals team surveying assets (OLE wire runs) across the East Coast Mainline (ECML), at the current time approximately 400 assets out of a bank of 1927 (on the ECML) have been surveyed. The data reported for 171 of the 400 assets (approximately 10% of the asset base) has been verified (via a manual check) and this data is being used to produce the M15 measure score for this year.
- 7.12.10 The new scoring method is based on data from defects identified and reported by routine track inspections rather than the previous means of conducting special inspections. Standard defect definitions have been developed within the Ellipse system to enable inspectors to categorise each fault found. The overall condition score for each asset is then derived from an algorithm that combines the type and number of defects found with a weighting reflecting their severity. Testing of the results obtained from the old and new processes has demonstrated satisfactory correlation of the overall scoring, and the new automated method should enable a vastly increased number of assets to be scored and reported in future years.
- 7.12.11 Automated processing of the data from Ellipse into a M15 measure is still to be tested. The same spreadsheets used to supply information into the Ellipse system are also being used to support the present manual M15 reports.

### Accuracy of reported data

- 7.12.12 A sample of 5 ECAP reports that were manually filled out by the Network Rail Renewals Enhancement Engineer (responsible for the M15 trial) was checked against the data in the spreadsheet, all reports that were checked were accurate.

## Assessment of confidence grade

- 7.12.13 **Reliability grade.** The definition for this measure is clearly documented. A single documented process has been followed to collect and report this measure; however as last year data from only a portion of network has been considered. We believe that M15 should have a reliability grade of C. However we have concerns that the limited data may not accurately reflect the nationwide condition.
- 7.12.14 **Accuracy grade.** Our samples found the data was recorded accurately in the spreadsheet held in the project team that is conducting the trial. However, the process of condition assessment is subjective. We believe that M15 should have an accuracy grade of 3.

## Audit Statement

- 7.12.15 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2009 for Electrification condition – a.c traction contact systems (M15). We can confirm the data has been collected and reported in accordance with the relevant definition and procedure. The data has been assessed as having a confidence grade of C3. The regulatory target for this measure has been met.

## Recommendations arising

### *Recommendations essential for the accuracy and/or reliability of the measure*

- 7.12.16 **M15 recommendation 1.** We recommend that the new reporting system is fully implemented in 2009 to enable Network Rail to report on national condition instead of a limited coverage area. This will also enable Network Rail to assess a much greater asset sample annually.

### *Observations relating to spreading of best practice and/or improvements to process*

- 7.12.17 We have no observations for this measure.

## Progress on outstanding recommendations from previous audit reports

- 7.12.18 We set out below our assessment on the current progress of Network Rail in addressing our outstanding recommendations for a.c traction contact systems (M15) from our previous Audits:

Recommendations made	Progress update
<p><b>2005-R37:</b> We recommend that the change process for allocating maintenance resources to undertake the M15 inspection process is completed as a matter of urgency.</p>	<p>The method for data collection in the new measure has been aligned with maintenance activities. <b>Current Status – Actioned and verified</b></p>
<p><b>2005-R38:</b> We recommend that the spreadsheet used to calculate this measure is (a) formatted in line with standard practice to improve clarity, (b) tidied so that regulatory calculations are in a logical order and (c) other unrelated calculations are deleted or moved to another spreadsheet.</p>	<p>Once the reporting function of the new measure is incorporated into the Ellipse system this spreadsheet will be obsolete. <b>Current Status – In progress</b></p>
<p><b>2006-R48:</b> We recommend that Network Rail identifies a method to ensure the sample each year is not grossly unrepresentative of the underlying population such that it impacts the results of the extrapolation.</p>	<p>Once the new measure is rolled out, it will provide a larger proportion of the population to be assessed each year. <b>Current Status – In progress</b></p>
<p><b>2007-R28:</b> We recommend that the dataset of condition scores should be recalculated using natural rounding now that 100% of the population has been assessed.</p>	<p>Network Rail agree with this recommendation and plan to recalculate the data set collected under the new method once the data set is larger. This will allow for continued trending. <b>Current Status – In progress</b></p>

**Figure 7.12.3 Progress on outstanding recommendations for a.c traction contact systems (M15)**

## 7.13 Electrification condition – d.c. traction contact system (M16)

### Audit scope

- 7.13.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2009, Section 3, Electrification condition – d.c traction contact systems (M16) ), including Tables 3.30 – 3.31.
- 7.13.2 M16 is a condition measure for conductor rail, based on (a) wear measurements of conductor rails and (b) extrapolation using a series of assumptions, to provide a condition grade from 1 to 5, where 1 is good condition and 5 is beyond the maximum allowable wear of 33%. The measure excludes all ETE (Electric Track Equipment) other than the conductor rail itself.
- 7.13.3 The definition and procedures for this measure are documented in the Network Rail Asset Reporting Manual, documents NR/ARM/M16DF (issue 3, 2007 and NR/ARM/M16PR issue 4 2008
- 7.13.4 Audits were undertaken at Network Rail Headquarters and Waterloo General Offices.

### Commentary on reported data

#### *Regulatory target*

- 7.13.5 The regulatory target for electrification condition set in ORR's Access Charges Review 2003 was to maintain the network at or below the baseline level recorded in 2001/02. In numerical terms, the regulatory target was an average condition score of not greater than 1.8.
- 7.13.6 The average condition score for all assets assessed by Network Rail to year-end 2008/09 was unchanged from 2007/08 at 1.9 which would again not meet the regulatory target. The percentage surveyed is also the same as the previous year.

#### *Trend*

- 7.13.7 Figure 7.13.1 and Figure 7.13.2 show the trend for average asset condition of conductor rails has remained largely static for the last five years.

Period	00/01-04/05	00/01-05/06	00/01-06/07	00/01-07/08	00/01-08/09
Average Condition Score	1.9	1.8	1.9	1.9	1.9
% Surveyed	68%	69%	70%	71%	71%

**Figure 7.13.1 Average condition of conductor rails (M16)**

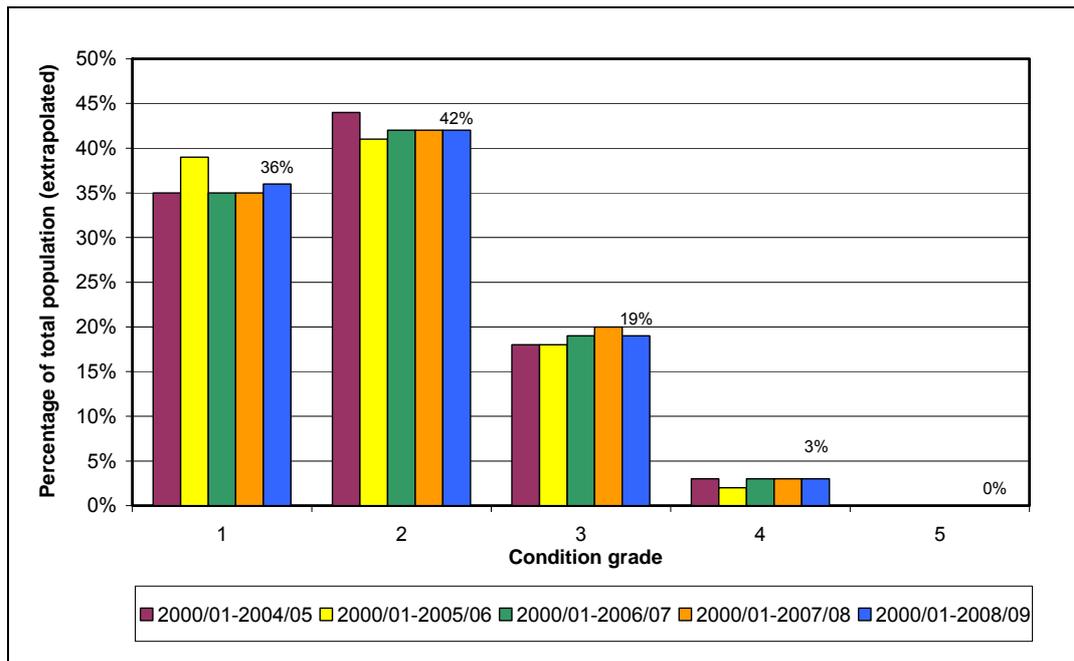


Figure 7.13.2 Average condition of conductor rails (M16)

## Audit findings

### Process

- 7.13.8 Wear measurement is undertaken by manual gauging in accordance with the work instruction NR/E/WI/27222 or by an approved conductor rail measurement system.
- 7.13.9 Each maintenance area has a manual gauging spreadsheet that is populated. This spreadsheet is then sent to Network Rail Engineering team (in this instance the Senior Renewals Enhancements Engineer – Contact Systems) who will then consolidate this information into a single spreadsheet. This spreadsheet is held at national level and contains the following information:
  - (a) Details of wear measure for the current and previous years
  - (b) Standard wear rates
  - (c) 'Project Wear Level' based on year gauged and established wear rates'
- 7.13.10 A national level spreadsheet is administered by the Senior Renewals Enhancement Engineer (Contact Systems). Most Areas complete this spreadsheet; however there are some Areas at the time of writing where this spreadsheet was not completed/updated with new records. For these areas only historical data is shown in the national level spreadsheet.
- 7.13.11 Once the information from other areas has been consolidated into a single spreadsheet, the Network Rail Contact Systems Senior Renewals Enhancement Engineer overlays this spreadsheet with further information that has been collected on the conductor rail contact systems condition, in the last year, and from recent renewal activities that have taken place. This spreadsheet is used to calculate the M16 score for d.c Contact System Condition.

### Accuracy of reported data

- 7.13.12 Halcrow checked a sample of calculation sheets and correctly matched the resulting wear measurements with those reported in the Territories' spreadsheets. The Territories' summary spreadsheets were found to correlate with the data in the Headquarters spreadsheet and also with the data presented in the Annual Return.

### Developments

- 7.13.13 As mentioned in the last two year's audit reports, gaining access to live d.c. conductor rail to undertake measurements is a significant challenge for Network Rail, as manual gauging on live conductor rail is not permitted under the Electricity at Work Regulations. To get around this problem, a train-borne Conductor Rail Measurement System (CRMS) has been developed to take a variety of measurements including wear, lateral and vertical distances to the running rail, ramp angles and gaps etc, to obtain wear calculations. This system has been integrated into the Southern Measurement Train (SMT).
- 7.13.14 The train is presently operational and the algorithms for conductor rail measurement are still being validated, even though improvements have been made. Once the train is conducting compliant runs, data will be collected at a much greater rate than currently possible through manual collection – measurements can be made at 300mm intervals compared to the standard 5 chains for manual measurement. This will increase the reliability and accuracy of data for this measure, although as mentioned in 2006/07, a revised strategy will need to be in place to enable proper verification and analysis of the wealth of data generated, which is also recognised by Network Rail.
- 7.13.15 The conductor rail measurements are successfully being collated by Network Rail on the SMT, although distinguishing between certain types of conductor rail type is proving a larger challenge than originally thought. There are five types of conductor rail that the system is designed to identify (measured in lbs/yard): 100, 105, 106, 150 narrow head and 150 wide head. In practice 106 and 150 lbs/yard conductor rail are being confused. Since this problem was first raised in the 2007/08 report however, various improvements have been made to the CRMS system. These include algorithm improvements, by measuring the depth of the rail foot, and also selecting a site where manual measurements could be taken at the same intervals as the CRMS, to directly compare the two.
- 7.13.16 For the year 2008/09, no CRMS measurements have been used, although after further positive developments within the system this year, the CRMS is envisaged to have a large impact on the M16 measure in the future, since it is evident that confidence is very much increasing with the system.. Further to this, a recent CRMS validation report has also recommended that wear reports are to be used, to further increase confidence in the system.

### Assessment of confidence grade

- 7.13.17 **Reliability grade.** The definition and procedure for this measure is clearly documented and has been followed this year. The process of condition assessment is subject to extrapolation. We believe that M16 should have a reliability grade of C.
- 7.13.18 **Accuracy grade.** The calculation of wear is largely extrapolated using historic wear rates for different rail types and estimated levels of wear for when the dates of wear measurements have been lost. The condition grade is directly based on this extrapolated data. We believe that M16 should have an accuracy grade of 4.

## Audit Statement

- 7.13.19 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2009 for electrification condition of d.c traction contact systems (M16). We can confirm the data has been collected and reported in accordance with the relevant definition and procedure. The condition grade is based on extrapolated data. The data has been assessed as having a confidence grade of C4. The regulatory target has not been met.

## Recommendations arising

### *Recommendations essential for the accuracy and/or reliability of the measure*

- 7.13.20 We would recommend that Network Rail start to implement the CRMS system in order to improve their confidence grades.

### *Observations relating to spreading of best practice and/or improvements to process*

- 7.13.21 We have no observations for this measure.

## Progress on outstanding recommendations from previous audit reports

There are no outstanding recommendations for this measure.

## 7.14 Station stewardship measure (M17)

### Audit scope

- 7.14.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2009, Section 3, Station Stewardship Measure (M17), including Table 3.32.
- 7.14.2 This purpose of this measure is to assess Network Rail's stewardship of stations. The condition of assets at each station is scored during visual inspections by comparing the assessed remaining asset life as a percentage of a benchmark full asset life for 68 types of asset which may be present at the station. The percentage of remaining asset life is averaged (unweighted) and converted into a condition grade for each of the 68 elements. The condition grades are integers from 1 to 5, where 1 is good condition and 5 is poor condition. Each of the 68 elements is weighted according to importance (and cost implications) of being 'suitable for safe and efficient operational use' of the station. The intention is that the resulting station condition grades will then be weighted and averaged to produce the overall SSM score for all stations. However, the station category weighting methodology is not yet confirmed.
- 7.14.3 The definition and procedures for this measure are documented in the Network Rail Asset Reporting Manual, documents (NR/ARM/M17DF issue 4, 2009) and (NR/ARM/M17PR Issue 5, 2009) respectively.
- 7.14.4 Audits were undertaken at Network Rail Headquarters, Network Rail's York Office and Network Rail's appointed external auditor (WSP).

### Commentary on reported data

- 7.14.5 Section 6.0 of the new procedure requires that a comparative Station Condition Measure (SCM) is produced for the remainder of CP3. This is to allow for assessment of the regulatory target and trending against the previous SCI measure. This year Network Rail has reported both an SCI and SSM score for the network but the SCI score is not comparable to previous years.
- 7.14.6 The regulatory target for the station condition index was set in ACR2003 to be no deterioration from the 2003/04 levels. For the now superseded SCI this was to maintain the average condition grade at 2.25. The reported SCI score is 2.08, but as it is not comparable to previous years' scores, no comment can be made as to whether the regulatory target has been met. Note that the condition scores for both SSM and SCI are rolling five year averages of all the scores, not a snapshot of the scores of the inspections undertaken during the reporting year.

### Trend

- 7.14.7 Figure 7.14.1 shows both the SSM and SCI scores over the past five years.

Period	2004/05	2005/06	2006/07	2007/08	2008/09
Average SCI score	2.23	2.22	2.24	2.24	2.08
Average SSM score	-	-	-	2.71	2.48

Figure 7.14.1 Average condition of Stations (M17)

- 7.14.8 Network Rail provided us with MS Access database files showing all stations for which inspections have been undertaken, as well as the calculations for the SCI or SSM scores for 2008/09.

## Audit findings

### *Inspection Process*

- 7.14.9 There are currently 2 inspections types; 'detailed' and 'visual'. The detailed inspection is a traditional paper based inspection with photographs and comments. The visual inspections are undertaken to confirm data from the detailed inspections. At both these inspections data is collected and confirmed on risk and asset life. Detailed inspections are conducted every five years and visual inspections for each of the 4 years in between. The data collected during these inspections is used to estimate an overall condition score. This score is used to inform the M17 measure.
- 7.14.10 During our meeting at Network Rail HQ, we requested information on the number of SSM inspections (both detailed and visual) undertaken over the last 3 years. We were provided with a spreadsheet showing the number of inspections was as follows:
- (a) 2006/07: 224
  - (b) 2007/08: 2,030
  - (c) 2008/09: 675
- 7.14.11 This gives a total of 2,929 SSM inspections over the last 3 years. This count includes stations inspected more than once.
- 7.14.12 In their report, the external auditor (WSP) noted that only 104 stations were included in the audit sample presented to them. There is therefore a discrepancy between the figures for the number of surveys undertaken for 2008/09 reported by WSP (104 stations) and Network Rail (675). Neither of these two figures complies with the new M17 procedure that states that approximately 20% of the stations on the network are to be surveyed each year.
- 7.14.13 Network Rail explained that the difference between their figures and the WSP figures were due to the fact that the 104 surveys passed on to WSP was on the basis that these were the only surveys that had been uploaded onto the system on the date WSP was commissioned to undertake the work (30<sup>th</sup> January, 2009). The difference between the numbers is because the surveys only become 'live' when validated by the route asset steward and this results in a lot of stations getting added late in the year.
- 7.14.14 However, it must be noted that neither the WSP figure (104) nor the Network Rail figure (675) complies with the new M17 procedure that states that approximately 20% of the stations on the network are to be surveyed each year. The Network Rail figure is more than the recommended 20%.
- 7.14.15 As discussed last year, the new measure retains the system of condition grades based on a non-linear integer scale. We therefore still raise the same concerns that we did last year regarding the use of an integer scale and the effect it has on skewing the results to give a better score than would be achieved by the use of a formula. Integer banding may have been understandable to give simplicity with manual data collection methods, but the new methods render this obsolete.
- 7.14.16 While we generally endorse the process and the system being implemented for the new measure, there are some concerns with regard to the clarity of the new procedure document which does not provide enough information to explain in more detail how the station stewardship measure score is calculated.

### *Inspection Contracts*

- 7.14.17 For the 2008/09 Annual Return the SSM data was collected and entered into the OPAS web-based database (based on ATRIUM software) directly by the inspection organisation. There is also a validation process required to be completed before an inspection can be accepted (and taken into the Annual Return). However following our review of the Network Rail contractor's reports provided to the Network Rail external auditor WSP, it was evident that either this validation process was not applied or that the process does not work. A number of gaps were seen in the reports provided to WSP by Network Rail HQ. The M17 procedure also states that the Network Rail territory engineer is required to review the surveys and identify any discrepancies. However Network Rail HQ stated this in 2008/09 there was no input or review at the Network Rail territory level, but they suggested that from 2009/10 the territory would be reviewing and accepting the SSM reports.
- 7.14.18 It is noted that the asset weighting outlined in the new M17 procedure is not being implemented for the 2008/09 Network Rail Annual Return (nor was it for the 2007/08 return). The procedure states that a weighting process is required however it later states that this issue remains outstanding. This would then imply that once the weighting does come into effect, the scores that have been calculated to date i.e. for 2007/08 and 2008/09 can again not be compared to the future weighted SSM scores unless they are recalculated on the same basis.

### *External Auditor*

- 7.14.19 WSP were commissioned by Network Rail in mid March 2009 to undertake an audit on the station surveys undertaken in 2008/09 by the Network Rail appointed contractors by the end of March 2009. There were 104 (approximately 4% of the stations) surveys completed of which WSP were asked to undertake 18 (approximately 17% sample) audits, half on a 'desk-based' nature and the other 'site based'. Audits were undertaken between 17<sup>th</sup> and 31<sup>st</sup> March 2009. Unlike last year, this year the Network Rail contractors had completed all the stations, be it only 104, that Network Rail had required them to survey.
- 7.14.20 Three contractors, namely Grontmij, Mouchel Parkman and White Young Green carried out station surveys for Network Rail in the 2008/09 period, 6 stations were taken from each contractor and stations were selected based on geographical coverage and category. We found that a reasonable selection of stations had been audited by WSP.
- 7.14.21 WSP audit found a number of errors in the audits undertaken by the contractors such as missing assets, adding in assets that did not exist, and incorrect mark up of the station boundaries. Some station areas were not fully covered and generally there was missing information on survey reports. These findings point to the view that Network Rail has not carried out sufficient QA checks to verify the quality of the data in the OPAS system. The external auditor raised concerns that sufficient time was not available for the inspectors to adequately undertake the level of survey required.
- 7.14.22 It was noted however that the recording of defects had significantly improved in the last year 2008/09 and that this would lead to a better judgement of asset condition. During their conversations with Halcrow, WSP noted that the performance of 2 of the 3 Network Rail contractors had fallen significantly compared to last year. However WSP were of the view that this would not result in a significant effect on the M17 score.

### *Discrepancies between LNE and LNW in 2007/08 NR Annual Return*

- 7.14.23 It was noted that there were marked differences for the London North Western and London North Eastern territories in the 2007/08 Annual Return and this issue remains under investigation at this stage. A number of possibilities were discussed with Network Rail HQ and the external auditor and these are listed below:

- (a) Sample population was small

- (b) Historical bias
- (c) Pressure from territory on contractors
- (d) The algorithm was structurally unbalanced
- (e) The stations are generally in a better condition in London North Eastern.
- (f) Inconsistencies between different inspection contractors

7.14.24 Four of the six possible reasons for the discrepancy between the London North Western and London North Eastern have been rejected by Network Rail. The remaining two possibilities namely e) the stations are generally in better condition in London North Eastern and f) Inconsistencies between different inspection contractors are still under investigation.

#### *Accuracy of reported data*

7.14.25 The SSM score for each station is calculated based on 68 different elements. To calculate the SSI score, these 68 elements are mapped onto 32 elements, using a table provided in the database. However, there is no explanation as to how this mapping is done.

7.14.26 The SSI and SSM scores have been calculated as a simple average of all individual SSI and SSM scores. Based on the data provided we found that the SSI and SSM scores had been correctly calculated for 2008/09. However, we believe that it would be more appropriate to calculate the SSI and SSM scores as weighted averages, weighted by the number of stations in each category. If this were done, the weighted average SSI and SSM scores for 2008/09 would be 1.98 and 2.09 respectively.

7.14.27 We have a number of concerns regarding the number of stations in the sample size used to estimate the SSI and SSM scores. Network Rail have informed us that a total of 2,929 inspections have been undertaken in the last 3 years. However, the SSI score was calculated based on a total of 2,398 stations, while the SSM score has been calculated based on a total of 2,140. We have been unable to understand the reason behind these discrepancies

7.14.28 We also have concerns over the level of Network Rail QA check of the station surveys as there appears to be a marked difference in the level of accuracy of this data collection between contractors. There is also no review by the Territory Engineers (the technical experts), which forms part of the M17 reporting procedure.

7.14.29 The procedure also states that the SSM score is a weighted score. However the weightings have not been agreed and therefore could not be applied this year or last year.

#### **Assessment of confidence grade**

7.14.30 **Reliability grade.** The definition and procedure for this measure is approved. There is uncertainty over the number of stations which form the SSM sample, with the number provided by Network Rail differing from that in the database. We believe that M17 should have a reliability grade of C.

7.14.31 **Accuracy grade.** Network Rail has provided a score for this measure. However we have issues around how the score is calculated. We believe that M17 should have an accuracy score of 3.

## Audit Statement

- 7.14.32 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2008 for station stewardship measure (M17). The data has been collected however it has not been processed in line with the procedure. Achievement of the regulatory target for this measure can not be assessed. The data has been assessed as having a confidence grade of C3

## Recommendations arising

### *Recommendations essential for the accuracy and/or reliability of the measure*

- 7.14.33 **M17 recommendation 1.** It is recommended that SSM scores and SCI scores be calculated to allow ORR to compare the station asset condition over Control Period 3.
- 7.14.34 **M17 recommendation 2.** It is recommended that the new procedure is clarified to ensure that sufficient guidance is provided to explain in more detail how the SSM score is calculated.
- 7.14.35 **M17 recommendation 3.** It is recommended that the SSM score be calculated as a weighted average, based on the number of stations in each category.
- 7.14.36 **M17 recommendation 4.** The process and definition M17 have been updated this year; however the process is not being followed in three main areas:
- 20% of the stations have not been inspected this year as stated in the procedure
  - There has been no input or review by the Territory Engineers as stated in the procedure
  - Station category weighting (station level) based on weighting the individual scores per station has not been agreed or implemented

It is recommended that the new M17 procedure be fully implemented for CP4.

### *Observations relating to spreading of best practice and/or improvements to process*

- 7.14.37 We have no observations for this measure.

## Progress on outstanding recommendations from previous audit reports

- 7.14.38 We set out below our assessment on the current progress of Network Rail in addressing our outstanding recommendations for the Station Condition Measure (M17), from our previous Audits:

Recommendations made	Progress update
<b>2005-R40:</b> The issues with the hand held capture devices need to be resolved and HQ must communicate to the Territories the implementation plan for 2005-06.	This technology is now being used for the collection of data. <b>Current Status – Actioned and verified</b>
<b>2005-R41:</b> It is recommended that an external audit is commissioned for the M17 data. This should particularly focus on assessing the quality and accuracy of the scoring attributed on site. The Davis Langdon report indicated a number of errors, omissions and inconsistencies although the overall effect on the accuracy of the scores on the database was not stated.	WSP has been appointed as an external auditor. Their audits have included site visits which assess the accuracy of the scoring attributed on site. <b>Current Status – Actioned and verified</b>

Recommendations made	Progress update
<p><b>2005-R42:</b> It is recommended that the M17 assessment contractors are requested to undertake their own internal audits of the consistency and quality of the scoring, and to communicate the results to Network Rail.</p>	<p>The consultants have extensive quality assurance processes in place for checking the surveys entered into OPAS. <b>Current Status – Actioned and verified</b></p>
<p><b>2006-R50:</b> We recommend that this measure is improved to provide a better measure of the effectiveness with which Network Rail is delivering its stewardship obligations for stations. Issues to be considered are detailed in our 2005/06 report, including: a) review the scoring system including bigger range of scores, more precision, removing rounding, b) weight the element scores for each station to reflect importance and/or cost, c) weight the station scores for the overall score to reflect importance and/or footfall, d) review definition of condition to include physical integrity as well as cosmetic appearance, e) resolve effect of assumed future maintenance on current condition, f) consider combining collection of data with other surveys. We are aware that there is work currently on-going in this Area.</p>	<p>The move to the SSM has seen a number of these issues being addressed. There are however, still a number of these issues we still think are affecting this measure. NR have recently introduced a revised SSM scoring system to overcome these issues, however the evidence to show this is outstanding. <b>Current Status – In progress</b></p>
<p><b>2006-R51:</b> We recommend Network Rail reviews arrangements for the ownership of this measure and improves the level of compliance.</p>	<p>This year's audits have seen an improvement in the ownership of the measure and management of the consultants <b>Current Status – Actioned and verified</b></p>
<p><b>2007-R29:</b> If the use of MP&amp;I for management of the inspection contracts is continued, we recommend that this is applied consistently across the Territories and is documented in an updated procedure, which clearly outlines the responsibilities and ownership for this measure.</p>	<p>This year's audits have seen an improvement in the management of the consultants. This has been done in a consistent manner across the Territories; however the documentation of this has not been finalised and issued. Revised ARM documentation has been formally issued <b>Current Status – Actioned and verified</b></p>
<p><b>2007-R30:</b> To ensure consistency across the Network, we recommend that Network Rail check that inspection contractor's staff are suitably qualified and fully briefed on the procedure for this measure. This should also include keeping a register of the names of inspectors used to collect the data for this measure.</p>	<p>The introduction of OPAS has seen a retraining programme for all inspectors. A register of trained inspectors is kept by the Network Rail project managers. <b>Current Status – Actioned and verified</b></p>
<p><b>2007-R31:</b> We strongly recommend that the long-standing matter of necessary change to this measure to make it more appropriate and reflective of true asset condition be concluded between Network Rail and ORR this year in order to allow it to be implemented without further delay.</p>	<p>The introduction of the SSM has been agreed between Network Rail and ORR. We do note however that not all the issues mentioned in previous recommendation 2006-R50 have been address. <b>Current Status – Actioned and verified</b></p>
<p><b>2008 -</b> We recommend that a comparative measure to the previous SCI be calculated for the remainder of CP3.</p>	<p>NR stated that there has been considerable dialogue with the ORR on the reporting of station condition and the absence of the SCI score for 07/08. NR stated that both the SCI and SSM scores would be generated from the 07/08 data to complete the CP3 returns. <b>Current Status – In progress</b></p>

Recommendations made	Progress update
<p><b>2008</b> - We recommend that the variation between the Territories spread of SSM scores be investigated and if it is found to be caused by inconsistencies in approach between the surveying consultants the reasons should be identified and rectified.</p>	<p>The variation between the 07/08 SSM territories was discussed. NR confirmed that they had no further explanation as to the marked difference between the LNE/Scotland versus the West/SEA/LNW band scores. No further work had been undertaken on this subject.</p> <p><b>Current Status – In progress</b></p>
<p><b>2008</b> - We recommend that, for future years, the programme of surveys is developed to allow time for the consultant's QA process and the external audits to ensure all that year's surveys are included in the Annual Return. This may require setting more stringent deadlines for the consultants.</p>	<p>NR advised that the new inspection contracts to cover the CP4 period should remove the uncertainty that has gone before. Historically there were two inspections carried out, with the SCI inspection being instructed towards the end of the year, solely for the purpose of furnishing data for the Annual Return. Under the new contract regime, there would be a single inspection. The intention is to issue a work bank of 20% of the asset group each year and to have a timely annual audit towards the end of each year.</p> <p><b>Current Status In progress</b></p>

**Figure 7.14.2 Progress on outstanding recommendations for Station Stewardship Measure (M17)**

## 7.15 Light maintenance depot – condition index (M19)

### Audit scope

- 7.15.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2009, Section 3, Light Maintenance (LMD) Depot – condition index (M19), including Tables 3.33 – 3.34.
- 7.15.2 This measure assesses the average condition of all 89 Network Rail responsibility LMD's, using a methodology which provides a condition grade from 1 to 5, based on remaining life expectancy where 1 is good condition (long life) and 5 is poor condition (life expired).
- 7.15.3 The target is for 20% of the population to be inspected per annum thus enabling a 5 year rolling programme to be established. The individual score for each LMD is calculated as the average of the scores given to the following eleven asset elements:
- (a) Track;
  - (b) External lighting;
  - (c) Shore supplies;
  - (d) Fuelling facilities;
  - (e) Carriage washer;
  - (f) Wheel lathe;
  - (g) Gantry crane;
  - (h) Shed doors;
  - (i) Internal lighting;
  - (j) Superstructure;
  - (k) Facilities & accommodation;

The scores of the LMD's inspected are then aggregated to give a score for the reporting year.

- 7.15.4 The definition and procedures for this measure are documented in the Network Rail Asset Reporting Manual, documents NR/ARM/M19DF (issue 3), February 2004 and NR/ARM/M19PR (issue 5), February 2009. There is also a supplementary manual, NR/ARM/M19MN (Issue 2).
- 7.15.5 Audits were undertaken at Network Rail HQ and the following LMDs – Glasgow Yorker, Cardiff Canton and Leeds Neville Hill - Northern.

### Commentary on reported data

#### *Regulatory target*

- 7.15.6 The regulatory target for the light maintenance depot condition measure, set in ORR's Access Charges Review 2003, was to maintain the network at or below the baseline level recorded in 2003/04.
- 7.15.7 In numerical terms, the regulatory target was set at not exceeding an average condition grade of 2.7, which was reported in the 2003/04 Annual Return as the 2000/04 average condition grade. However, this figure has since been restated in table 107 of the 2005/06 Annual Return as 2.63.
- 7.15.8 In 2008/09, the average condition grade reported by Network Rail was 2.52, which would meet the regulatory target.

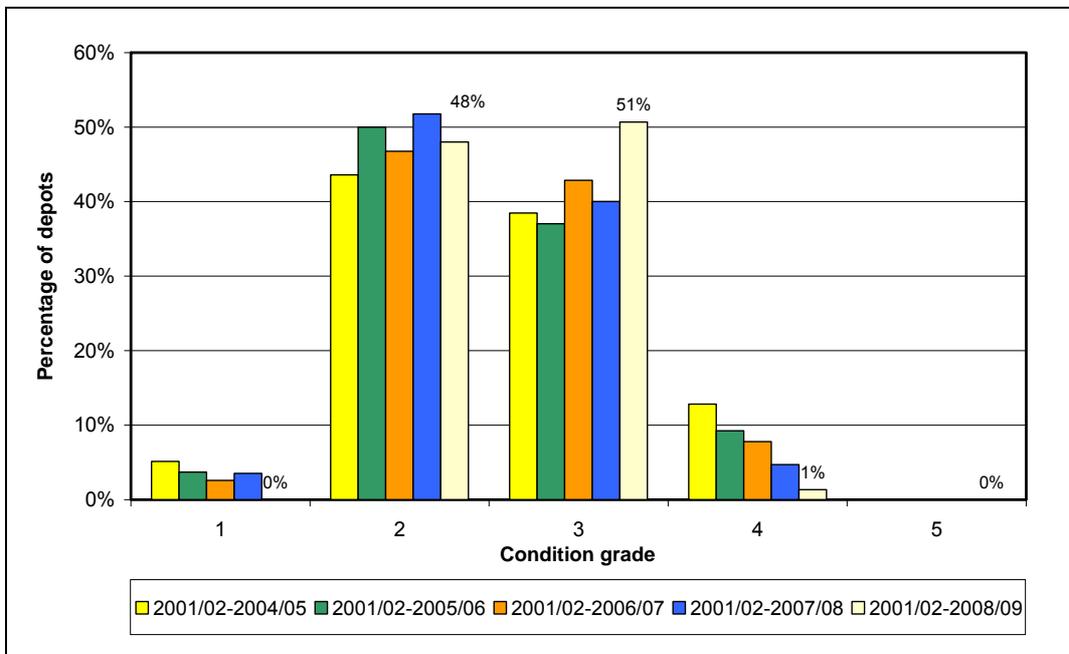
*Trend*

7.15.9 Figure 7.15.1 shows that the average LMD condition score has slightly increased from 2.49 last year to 2.52 this year and the percentage of depots inspected is now at 99% with all depots being inspected with the exception of with the London Wembley Central.

Period	04/05	05/06	06/07	07/08	08/09
Average Condition Score	2.63	2.58	2.56	2.49	2.52
% of depot survey	46%	64%	91%	96%	99%

**Figure 7.15.1 Average condition of LMD (M19)**

7.15.10 Figure 7.15.2 shows the trend for asset condition. The results for 2008/09 have shown an decrease in percentage of assets in condition grades 1,2 and 4, with increases in grade 3 and no change to grade 5, remaining at zero percent.



**Figure 7.15.2 Average LMD asset condition (M19)**

7.15.11 However, as yet the full asset population had not been inspected and the programme was not conducted on a randomised basis; therefore we are unable to draw conclusions regarding a trend.

7.15.12 The target in the procedure is for 20% of the population to be inspected every financial year, such that the whole population is inspected within 5 years. This is the ninth year of undertaking inspections and so far the condition of 85 LMD of the revised total population of 86 have been reported on up to year end 2008/09. In 2008/09 the total population of depots was reduced to 75, Network Rail explained this reduction as the removal of 'Full Leasing' LMD from the sample, these are LMD's that Network Rail has no responsibility for the maintenance or repair of the elements in these depots.

## Audit Findings

- 7.15.13 Audits were undertaken at three LMDs, Glasgow Yorker, Cardiff Canton and Leeds Neville Hill. The purpose of these audits was to verify the findings of inspections conducted by Amey Consulting and reported to Network Rail.
- 7.15.14 It was found that the reports were reasonably accurate in their reflection of the depot and the asset condition, however a number of inaccuracies were found in the allocated scores and the scoring sheet calculations. The errors and inaccuracies in the Leeds Neville Hill - Northern inspection report have an impact on the scoring for this LMD, reducing the overall score from 2.5 to 2.6.
- 7.15.15 At Glasgow Yorker the report stated that electrical test certificates were available and current at the LMD, however the depot personnel do not have these records at the depot and believe that if anybody has them it will be Network Rail. The auditor was unable to track them down.
- 7.15.16 It was found that none of the individual element record sheets or the depot summary sheets for any of the three depots had been signed by the surveyors, although their names are given.
- 7.15.17 There is concern that the requirement stated in the procedure to identify redundant assets is still not being actioned. An example of this was observed during the 2008/09 audit at Glasgow Yorker LMD where a series of lights are doing nothing more than lighting an area of ballast alongside a head shunt. The inspection report recorded these lights as 'not working' but should have been identified them as 'redundant and not required'. The lack of identifying redundant asset has been an issue for a number of years.
- 7.15.18 It was also expected that this measure would be updated in a similar way to M17 for the 2008/09 reporting period as it was stated by NR that this was imminent at last years audit interviews. It now appears that this will not be done until at least the 2010/11 reporting period.

### *Accuracy of reported data*

- 7.15.19 Network Rail HQ received copies of all the reports on the 27 LMD inspections undertaken in 2008/09 and forwarded them on for audit review. The individual LMD scoring sheets were initially checked and a significant number of calculation errors were found, examples of these errors were passed to Network Rail HQ with a request for the scoring sheets to be checked. Following checking, a second submission was made for audit review; however the inspection report scoring sheets still contained a substantial number of errors. At the time of writing this report we have still not received a third issue of the scoring sheets. Therefore we do not have confidence in the figure reported for this measure in the Final Annual Return.

## Assessment of confidence grade

- 7.15.20 **Reliability grade.** The definition for this measure is clearly documented. A documented process has been followed to collect and report this measure. The data from the inspections is subjective although an attempt has been made to assess the asset condition against measurable criteria. We believe that M19 should have a reliability grade of B.
- 7.15.21 **Accuracy grade.** We found a number of errors in the LMD inspection reports on a number of occasions which had not be corrected at the time of writing this report and would impact the asset score. There are still shortcomings in the process in both report checking and Headquarters audit. We believe M19 should have an accuracy grade of 4.

## Audit Statement

- 7.15.22 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2009 for light maintenance depot – condition index (M19). We can confirm the data has generally been collected in accordance with the relevant definition and procedure. The data has been assessed as having a confidence grade of B4. The regulatory target for this measure of 2.63 has been met.

## Recommendations arising

### *Recommendations essential for the accuracy and/or reliability of the measure*

- 7.15.23 **M19 recommendation 1.** It is recommended that Network Rail HQ carry out checks on the data that is provided by AMEY in CP4 for the LMDs on both an individual sheet basis and a summary levels basis, as the data that is currently being presented is not accurate.

### *Observations relating to spreading of best practice and/or improvements to process*

- 7.15.24 We have no observations for this measure.

## Progress on outstanding recommendations from previous audit reports

- 7.15.25 We set out below our assessment on the current progress of Network Rail in addressing our outstanding recommendations for Light maintenance depot – condition index (M19) from our previous Audits:

Recommendations made	Progress update
<b>2005-R45:</b> A commitment should be made to complete, and report, condition for 100% of depots for the end of 2006-07, regardless of the method used to collect and extract the results.	This recommendation was not achieved for 2006/07 and the full population has still not been inspected. <b>Current status – Withdrawn</b>
<b>2005-R46:</b> An audit should be undertaken to ensure that the quality of the on-site auditing is within an acceptable tolerance. This will provide confidence to Network Rail and the Office of Rail Regulation that the average condition grade being generated is a representative and relevant measure of the underlying condition of the Light Maintenance Depots.	Network Rail have appointed WSP as an external auditor for the Operational Property Asset System (OPAS) inspections. The new LMD condition inspection will be conducted as part of these inspections and thus will be included in the audits.  NR to check and determine whether any auditing of the depot inspections was carried out by WSP as part of their audits of the Operational Property Asset System (OPAS) inspections. Evidence of these audits is to be provided. <b>Current status – In Progress</b>
<b>2006-R54:</b> We recommend that this measure is improved to provide a better measure of the effectiveness with which Network Rail is delivering its stewardship obligations for light maintenance depots. We are aware that there is work currently ongoing in this Area.	This recommendation was repeated in our 2007 Annual Return Audit Report by Recommendation 2007-R34.  The anticipated changes to this measure align with the changes being made to M17 Station Stewardship measure; however this has not been achieved for the 2008/09 period. The process is currently in progress with the revisions currently in the consultation stage with ATOC following which ORR will be approached. It is hoped that the new measure will be in place 2010/11 <b>Current status – Repeated in later year</b>

Recommendations made	Progress update
<p><b>2006-R55:</b> We recommend the inspection reports should be shared with the depot facility operator, as the results cover both maintenance and renewals works, so that improvement actions by both parties can be agreed, possibly in the form of a five year plan.</p>	<p>We have been advised that the new measure for LMD will pick-up this recommendation. NR to check whether information collected from the depot inspections is currently shared with the depot facilities operators, identifying the method in place to ensure this occurs.</p> <p><b>Current status – In Progress</b></p>
<p><b>2007-R34:</b> We strongly recommend that the long-standing matter of necessary change to this measure to make it more appropriate and reflective of true asset condition be concluded between Network Rail and ORR this year in order to allow it to be implemented without further delay.</p>	<p>Network Rail has advised that work has begun work on developing this new measure using the OPAS for the collection and storage of condition information. We'd expect this measure in place for the 2008/09 Annual Return.</p> <p>The anticipated changes to this measure align with the changes being made to M17 Station Stewardship measure; however this has not been achieved for the 2008/09 period. The process is currently in progress with the revisions currently in the consultation stage with ATOC following which ORR will be approached. It is hoped that the new measure will be in place 2010/11</p> <p><b>Current status – In Progress</b></p>
<p><b>2007-R35:</b> To ensure consistency across the Network, we recommend that Network Rail check that inspection contractor's staff are suitably qualified and fully briefed on the procedure for this measure. This should also include keeping a register of the names of inspectors used to collect the data for this measure.</p>	<p>The new LMD condition measure will use OPAS for data collection and thus will provide a control on contractor's inspectors as it has for the M17 measure.</p> <p>NR advised that a register has/was being kept by an external delivery agent, however this activity has now been bought in-house and previous records may not be available. With changes being made in the organisations undertaking the inspection and delivery of the activity a series of briefing sessions was conducted by NR HQ. Only trained persons are allowed to use the OPAS therefore this provided quality assurance to NR that persons involved are competent. The M19 condition measure did not use OPAS for the year 2008/09, the inspections have been conducted in the same manner as in the previous years but using OPAS trained personnel.</p> <p><b>Current status – In Progress</b></p>

Figure 7.15.3 Progress on outstanding recommendations for Light maintenance depot – condition index (M19)

## 7.16 Network Rail Asset Stewardship Incentive Index (ASII)

### Audit scope

- 7.16.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail’s Annual Return 2009, Section 3, Network Rail Asset Stewardship Incentive Index (ASII), including Tables 3.35 – 3.36.
- 7.16.2 This measure is an aggregate index comprising measures of condition and performance of track, signalling, electrification, structures and earthworks. The index is compiled nationally and is a calculated measure, based on the results for measures reported elsewhere in the Annual Return and the associated targets from ACR2003 for these measures, such that if the results are exactly equal to the ACR2003 targets then the ASII is equal to one.
- 7.16.3 The definition and procedures for this measure are documented in Level 1 of Network Rail’s KPI Manual (July 2006).
- 7.16.4 The audit was based on data supporting calculations and index definitions provided by Network Rail National Engineering Reporting Team. Our audit focused on ensuring the data used in calculation was consistent with that reported elsewhere in the Annual Return and that the calculation was correct.

### Commentary on reported data

#### Regulatory target

- 7.16.5 The regulatory target for this measure is an ASII value of 0.90 for the end of the control period (2008/09); this target forms an incentive for Network Rail to outperform the ACR2003 targets. No annual targets have been set for ASII.
- 7.16.6 The 2008/09 result of 0.596 would meet the end of control period regulatory target.

#### Trend

- 7.16.7 Figure 7.16.1 shows the trend for the constituent parts of the index.

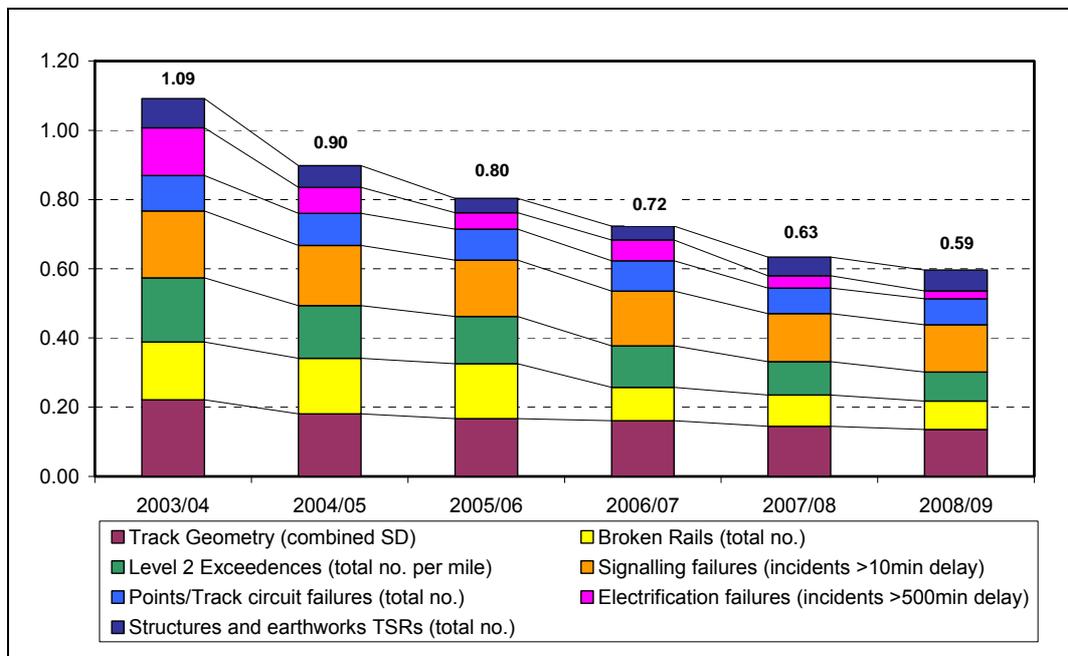


Figure 7.16.1 Asset Stewardship Incentive Index (ASII)

- 7.16.8 This year, Network Rail has reported a 6% improvement in the ASII reported figure. This reflects an improvement in nearly all of the constituent elements of the index. However structures and earthworks TSRs have shown a slight worsening of the situation.

## Audit findings

### Process

- 7.16.9 Collection and reporting processes for each of the ASII elements are reported against relevant measures:
- Asset Failures (network-wide totals);
  - M1 (broken rails);
  - M3 (track geometry - national standard deviation);
  - M4 (condition of asset temporary speed restrictions);
  - M5 (level 2 exceedences);
  - M9 (Signalling failures);
  - M11 and M12 (traction power incidents causing >500min train delays).
- 7.16.10 The only element which does not come directly from the Tables given in the Annual Return is that of the Track Geometry Index. This index is calculated using the twelve standard deviation measures given as part of M3 in Table 3.9; it is based on twelve baselines and twelve targets defined by the ORR and averaged to provide the index.
- 7.16.11 The National Engineering Reporting Manager is responsible for inputting the results for these measures into a spreadsheet which contains an algorithm for calculating and reporting the results.

### Accuracy of reported data

- 7.16.12 We audited Network Rail's calculation spreadsheet and independently reproduced the calculation of the ASII and the track geometry index. We also checked the values used in the calculation against the source data provided elsewhere in the Annual Return. Figure 7.16.2 shows the checks that were performed for each element of the ASII.

Asset Measure (NR KPI)	Value	Check
Track geometry index (6.10)	0.679	Index calculated using M3, Table 3.9
Broken rails (6.1)	164	Checked against M1, Table 3.1
Level 2 exceedences (6.2)	0.502	Checked against M5, Table 3.16
Signalling failures causing delay of 10min or more (6.3)	19,622	Checked against M9, Table 3.20
Points/ track circuit failures	14,515	Checked against Table 1.23
Traction power supply failures causing 500min delay or more (6.7 & 6.8)	80	Checked against M11, Table 3.24 Checked against M12, Table 3.25
Structures & earthworks temporary speed restrictions (6.5 & 6.6)	23	Checked against M4, Tables 3.14 & 3.15
<b>Asset Stewardship Incentive Index</b>	<b>0.596</b>	<b>Index calculated, ASII, Table 3.35</b>

**Figure 7.16.2 Checks performed for ASII using data sourced from Annual Return 2008 (ASII)**

- 7.16.13 For points and track circuit failures, the value used in the calculation of the ASII of 14,518 does not match the figure of 14,515 reported in Table 1.23 of the Annual Return. This minor discrepancy does not have a material affect on the overall ASII value of 0.596.

### Assessment of confidence grade

- 7.16.14 **Reliability grade.** We believe that the reliability grade given to ASII should be a weighted average of all its constituent parts. When the reliability grades are given in numeric equivalents (e.g. A=1, B=2, etc.) and these are weighted, the result is 1.6, which equates to a grade B. We therefore believe that the ASII should have a reliability grade of B.
- 7.16.15 **Accuracy grade.** This measure is a composite of other measures in the Annual Return 2009. Due to the inherent nature of the confidence grading system we do not believe it is sensible to provide an accuracy score for ASII based on either weighting the accuracy grades of the constituent measures, or on a subjective assessment. We believe that ASII should have an accuracy grade of 'X', indicating that an accuracy grade cannot be properly ascribed to the measure (as stipulated in the confidence grading guidance: Appendix D).

### Audit Statement

- 7.16.16 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2009 for the Asset Stewardship Incentive Index (KPI 6). We can confirm the data has been calculated in accordance with the relevant procedure. We believe these calculations have not materially impacted the reliability and accuracy of the data reported. Based on the average reliability grade of the its constituent parts, the ASII has been assessed as having a confidence grade of BX.

### Recommendations arising

#### *Recommendations essential for the accuracy and/or reliability of the measure*

- 7.16.17 We have no recommendations for this measure.

#### *Observations relating to spreading of best practice and/or improvements to process*

- 7.16.18 We have no observations for this measure.

### Progress on outstanding recommendations from previous audit reports

- 7.16.19 There are no outstanding recommendations for this measure.

## **8      Audit report and commentary – Activity Volumes**



## 8.1 Track Renewal Volumes (M20, M21, M22, M25)

### Audit scope

- 8.1.1 These audits were undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2009, Section 3, Track Renewal Volumes which comprises the renewals volumes for rails (M20), sleepers (M21), ballast (M22) and switches & crossings (M25), including Tables 4.1 – 4.12.
- 8.1.2 The definitions and procedure for these measures are documented in:
- (a) RT/ARM/M20DF (issue 5);
  - (b) RT/ARM/M21DF (issue 5);
  - (c) RT/ARM/M22DF (issue 5);
  - (d) RT/ARM/M25DF (issue 2);
  - (e) RT/ARM/M20PR (issue 4).
- 8.1.3 These measures have a common procedure and data collection process; we have therefore audited and reported on these measures together. The Audit was planned to be undertaken for Network Rail's Infrastructure Investments (II) delivered projects and for maintenance delivered projects. No audit was planned for West Coast Route Modernisation (WCRM) as this project is drawing to a close. For II delivered projects, we undertook the audit at Network Rail Headquarters and South East Territory at London Waterloo. For maintenance delivered projects we undertook the audit at Network Rail headquarters and at the Maintenance Delivery Unit (MDU) in Woking.

### Commentary on reported data

#### *Regulatory targets*

- 8.1.4 There are no regulatory targets for these measures.

#### *Trend*

- 8.1.5 Based on the data provided in Network Rail's Annual Return 2009, Figure 8.1.1 shows that non-WCRM sleeper and ballast renewal rose between 2003/04 and 2006/07, but however fell in 2007/08 and again in 2008/09. Non-WCRM rail renewals increased between 2004/05 and 2005/06, fell over the next three years, but rose again in 2008/09.

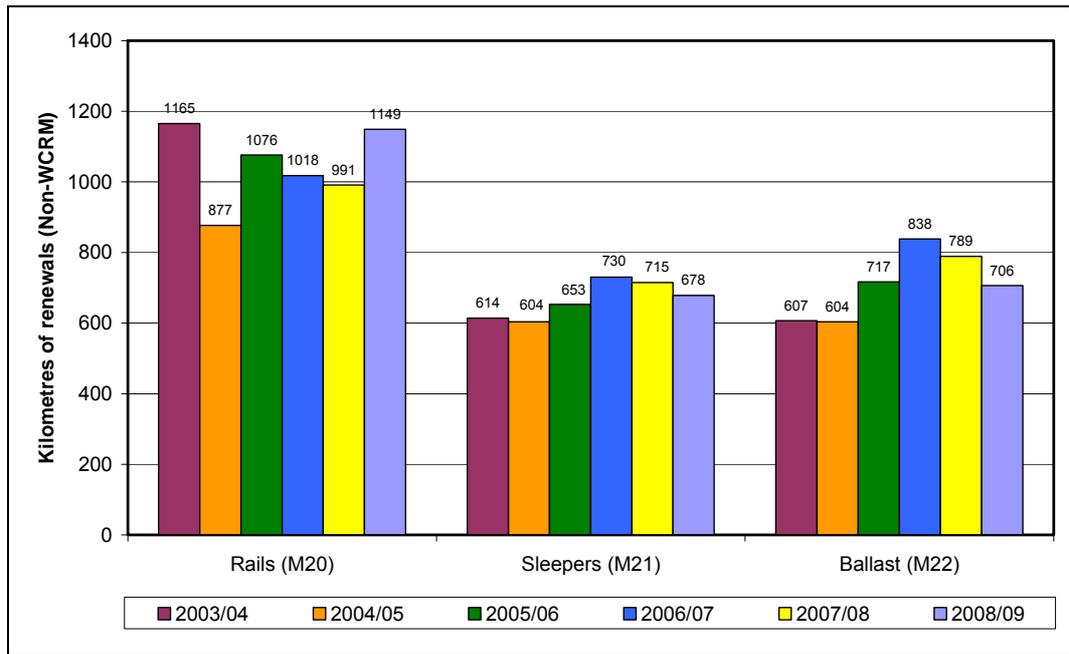


Figure 8.1.1 Track renewal volumes excl. WCRM (M20, M21, M22)

8.1.6 Figure 8.1.2 shows non-WCRM full S&C renewals rose between 2003/04 and 2008/09. They have however fallen by 17% over the last 2 years. The changes have resulted from a change in Network Rail’s asset management practices for S&C over this period.

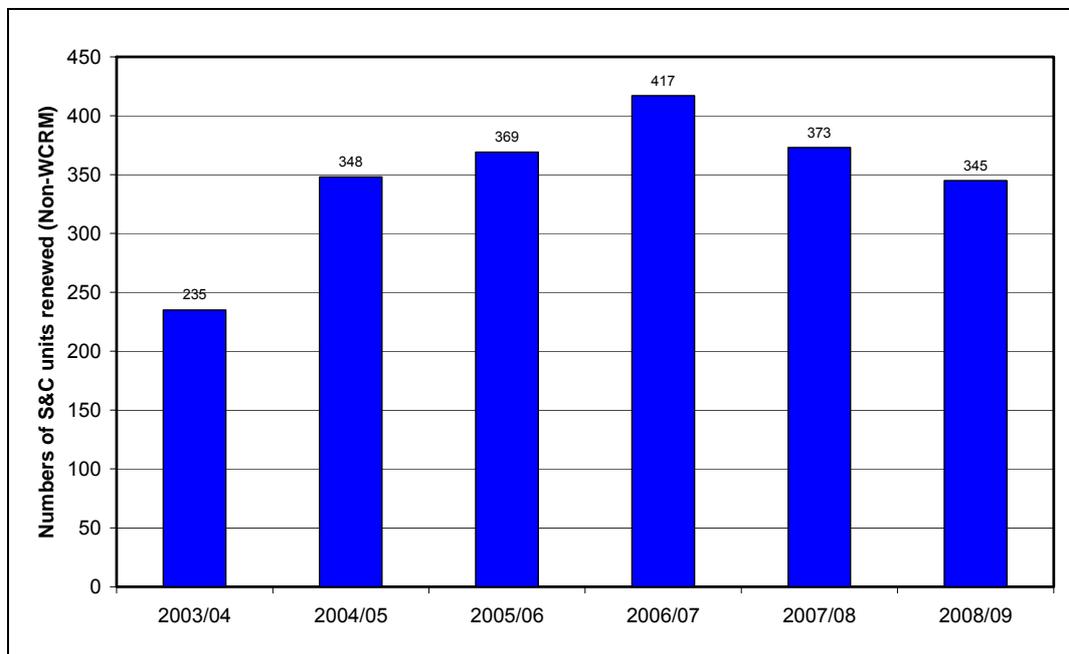


Figure 8.1.2 Switch and crossing full renewals excl. WCRM (M25)

8.1.7 Figure 8.1.3 shows the non-WCRM S&C renewals by type of renewals undertaken over the last 6 years. The last year saw a fall in both the reported number of removals/recoveries works as well as in partial renewals/reballasting.

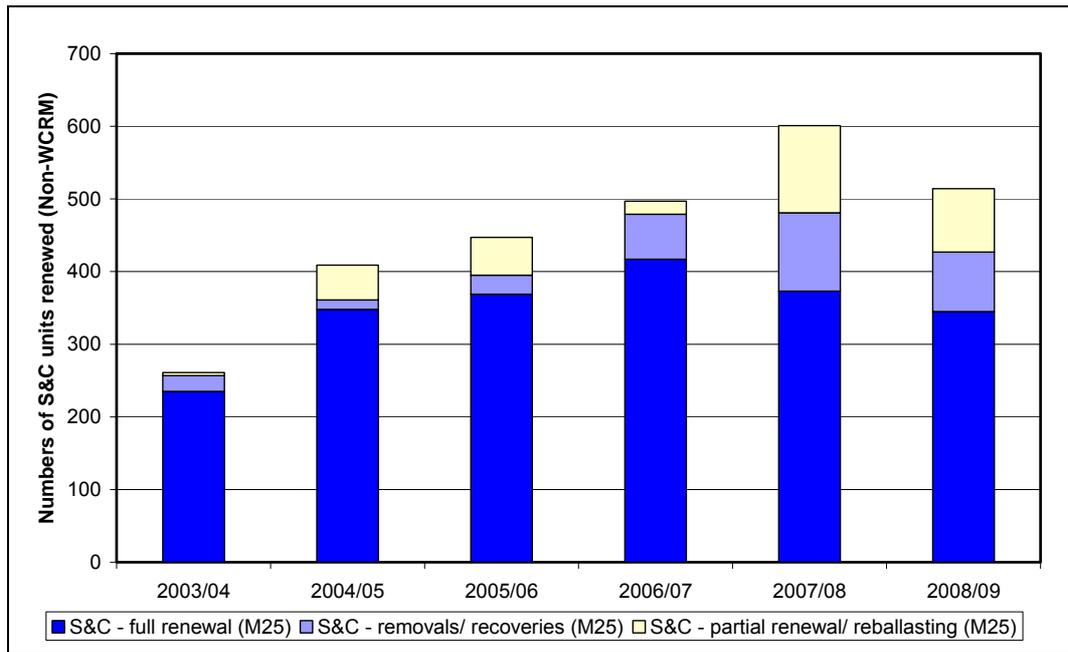


Figure 8.1.3 Switch and crossing renewal excl. WCRM by type (M25)

## Audit findings

### Process

#### II track renewals

- 8.1.8 Data for renewals undertaken is found in the P3e database. Renewals works are normally undertaken on site over the weekends, and volumes data entry into P3e is done by the planners in the territories on the Monday morning. The GEOGIS form is filled in by the contractor by Wednesday, and is verified against what is in P3e. The final volumes are based on the GEOGIS form.
- 8.1.9 At the end of every period, the Track Renewals Programme team in each territory compile Management Business Review (MBR) Reports, which include data on renewals volumes and costs. The central Track Renewals Team collates the annual return data from the MBR reports.
- 8.1.10 We requested P3e summary data output showing all II delivered projects for both track and S&C units, and check this against the reported data.
- 8.1.11 We undertook audit of individual schemes in 1 Territory – South East. On the Monday morning following the completion of a renewals work, there is a review meeting between the Network Rail project manager and the contractor’s renewals managers to discuss the work and determine the extent of renewal delivered by the contractor (this is also discussed on the Sunday/Monday between the weekend control office and site). A GEOGIS report is completed by the contractor and sent to Network Rail for checking and input into the P3e database. At the follow-up meeting on Wednesday the completed volumes from the previous weekend are confirmed.

#### Maintenance delivered track renewals

- 8.1.12 Based on the recommendations contained in the investment papers, the Investment Panels decide which renewal schemes will be delivered by the Maintenance organisation. The maintenance team in HQ maintain a work bank of projects for the year which contain projects by value. A tracker spreadsheet is used to monitor progress of projects on a period-by-period basis for each territory.

## Accuracy of Reported Data

### II track renewals

- 8.1.13 We checked the P3e database and the processes used to consolidate all the information for reporting purposes, and found this to be correct.
- 8.1.14 During the visit to South East Territory, 6 plain line renewals projects were audited. In all of them the volumes delivered (in yards of plain line track renewed) was less than the planned volumes. There were a number of technical and logistical changes to the planned volumes found from the audit as is normal.
- 8.1.15 However, these changes included an issue with a specification from Engineering having to be re-visited after the business plan had been put together. Network Rail has accelerated the job specification process in recent years to improve the planning process. However there still seems to be a possible issue with the quality of the specifications from Engineering.
- 8.1.16 There is also an issue with the change control process that there is a lack of clarity regarding the explanation of underlying reasons for variances between planned and actual renewal volumes. The quality of the descriptions varied generally depending on the P3e planner and very little information was provided on the 'Change Control' forms & 'Track Renewals shortfall, reduced scope & deferred notification' forms.
- 8.1.17 No errors with the volumes by the P3e planner were found. However, there was a lack of clarity regarding the changes where renewal items were complex and involved several renewal treatment types being altered both in category and length. This complexity suggested that volumes could easily become distorted somewhere in the reporting chain unless the changes were tabulated and clearly described.

### Maintenance delivered track renewals

- 8.1.18 An audit was undertaken at the Wessex MDU in Woking. Maintenance renewals are dealt with at the MDU level. When the work is completed each MDU updates GEOGIS using a standard GEOGIS input pro-forma. Oracle Projects (which was introduced in 2008/09) records these volumes (both planned and actuals). However, for 2008/09 the Route Financial Controller stated that the planned and actual volumes put into Oracle Projects (OP) are unreliable, but it is expected that this will become more reliable for 2009/10.
- 8.1.19 The volumes in GEOGIS are currently in yards, while the volumes in Oracle Projects are in metres and therefore a conversion is required between the two. A test check was undertaken to confirm that the conversion from yards to metres was correctly being done.
- 8.1.20 A sample of 6 maintenance delivered projects was audited. The projects were selected as they all showed a large variance between planned and actual volumes in OP. However, because of the unreliability of this data, we were unable to assess the reasons behind the variances. For only 3 of the projects were we able to confirm that the engineering planned volumes matched those reported in GEOGIS. The other 3 were planned at short notice due to the need to remove rolling contact fatigue defects and were therefore reactive projects none of which were in the original business plan.

### West Coast Route Modernisation track renewals

- 8.1.21 Given that the WCRM project is winding down, we did not conduct a process audit in their offices, but instead confirmed that the procedure for reporting data has not changes since last year, and that the volumes reported are correct.

## Assessment of confidence grade

- 8.1.22 **Reliability grade.** The definition for this measure is clearly documented. A single documented process has been followed to collect and report the high level summary data for this measure as well as at the individual job level. We believe that the track renewals measures (M20, M21, M22, M25) should have a reliability grade of B.

- 8.1.23 **Accuracy grade.** The data reported by the II teams has been audited and found to be accurate. There were however concerns over the change control processes being followed. For maintenance delivered projects, there are issues over the accuracy of the data reported in the OP database. We believe that the track renewals measures (M20, M21, M22, M25) should have an accuracy grade of 2.

### Audit Statements

- 8.1.24 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2009 for the track renewals measures (M20, M21, M22, M25). We can confirm the data has been collected in accordance with the relevant definition and procedure. The data has been assessed as having a confidence grade of B2. There are no regulatory targets for these measures.

### Recommendations arising

- 8.1.25 **M20-M22, M25 recommendation 1.** Network Rail need to ensure that the OP data for maintenance delivered works is more reliable.
- 8.1.26 **M20M22, M25 recommendation 2.** The change control process being followed in the Territories need to be reviewed to ensure that there clarity regarding the explanation of underlying reasons for variances between planned and actual renewal volumes.

### Progress on outstanding recommendations from previous audit reports

- 8.1.27 We set out below our assessment on the current progress of Network Rail in addressing our outstanding recommendations for the track renewals measures (M20, M21, M22, M25) from our previous Audits:

## 8.2 Signalling Renewed (M24)

### Audit scope

- 8.2.1 These audits were undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail’s Annual Return 2009, Section 4 Signalling Renewed (M24), including Table 4.13.
- 8.2.2 This measure reports the volume of signalling renewed in Signalling Equivalent Units (SEU). An SEU is a single trackside output function controlled by an interlocking. The number of SEU reported as renewed is dependent on the extent of work. A percentage reduction is applied for partial renewals.
- 8.2.3 The definition is contained in Network Rail’s Asset Reporting Manual NR/ARM/M24DF and associated procedure NR/ARM/M24PR both dated 29 February 2008. They are updated restatements of Network Rail’s business procedure BP001
- 8.2.4 Audits were undertaken at Network Rail HQ. We also obtained signalling plans and statistics for 3 schemes covering London North Eastern, London North Western and Sussex Routes.

### Commentary on reported data

#### Regulatory target

- 8.2.5 There is no regulatory target for this measure.

#### Trend

- 8.2.6 Figure 8.2.1 shows there has been a reported decrease in the number of SEU renewed in 2008/09 as compared to the previous reporting period. A total of 1,031 SEU were reported as being renewed as compared to the Network Rail Business Plan target of 1,109. This was made up of some Routes renewing more SEUs than forecast, some less (in some cases none) and others meeting target. Overall there was approximately a 7% shortfall on SEU renewed compared to those forecast, but perhaps more significantly this represented a 28% decrease in the number of SEU’s renewed as compared to 2007/08.

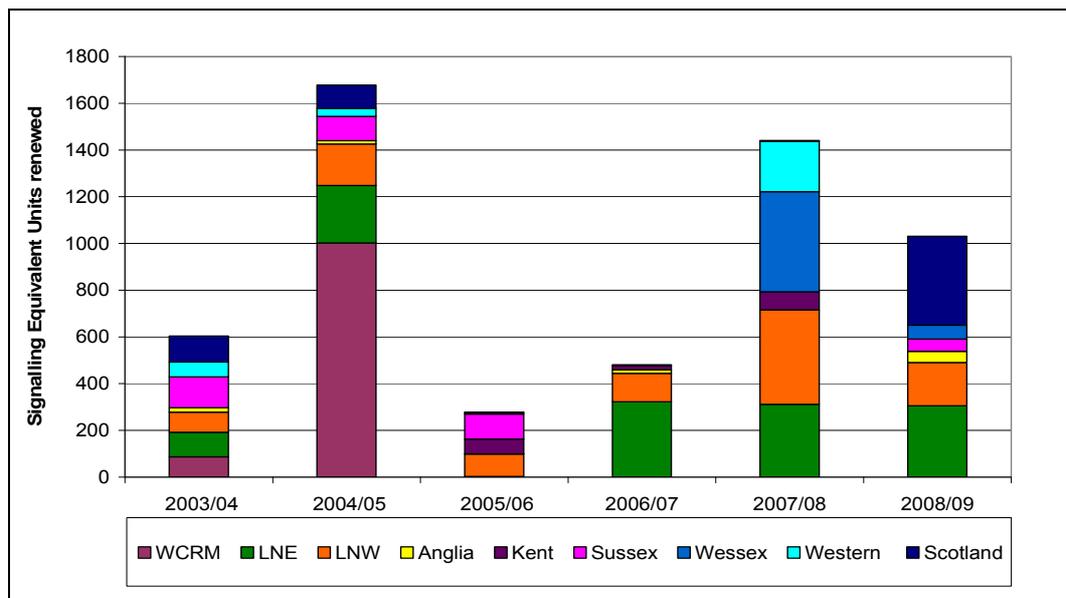


Figure 8.2.1 Signalling renewals (M24)

## Audit findings

### Definition

- 8.2.7 During our Audit Network Rail stated that they now reported on SEU volumes using NR/ARM/M24 where the weighting applied to the categories of renewals is
- (a) Full Renewal -100%
  - (b) Interlocking Renewal – 45%
  - (c) Outside equipment 50%
  - (d) Control system 5%
  - (e) Mechanical Signal Box life extension (33%)

### Process

- 8.2.8 The process described in the procedure for this measure has been generally followed. The SEU count for each interlocking is stored in the Interlocking Data Cards (IDCs). The SEU data for individual projects is input into the P3e database by the Programme Control Managers in the Routes. The SEU is used as a broad project control measure at various key stages to monitor changes to project scope. As such the SEU is a tool used by Network Rail for managing projects. The signalling engineers in the renewals teams use as-built drawings to count the number of renewed SEU commissioned into use. The final Annual Return numbers are collated from P3e and adjusted by the HQ team to account for partial renewals in accordance with NR/ARM/M24.

### Accuracy of data reported

- 8.2.9 Out of a total of 12 projects undertaken, a sample of 3 projects (1 each from Sussex, London North Eastern and London North Western) were selected for a more detailed audit of the scheme plans. Our detailed findings are as follows.
- 8.2.10 **Project No. BBB440**, Bognor-Barnham, Sussex Route. A total of 53 SEU's were reported in the P3e database, which matched with the number in the scheme plans.
- 8.2.11 **Project No. 102515**, Lincoln Station Area, LNE Route. A total of 132 SEUs were reported in the P3e database. These were broken down into 82 SEUs in Plan 1, 39 SEUs in Plan 2, and 11 SEUs in Plan 3.
- 8.2.12 The 82 SEUs in Plan 1 were checked and found to be correct.
- 8.2.13 In Plan 2, 9 signals and 6 points have been scored as full signalling renewal (100%) where the method of control has been changed from electro-mechanical to SSI (Solid State Interlocking). We believe that this is within the spirit of the procedure as a new control centre, new interlocking and new outside control equipment has been provided and hence may be classified as a full renewal. However, the actual signalling structures were not renewed and therefore it could be stated that 100% renewal was not carried out. The procedure as defined in NR/ARM/M24PR does not cater for such a situation and perhaps would benefit from review. We agree with the 39 SEUs given in Plan 2.
- 8.2.14 The 11 SEUs in Plan 3 were checked and found to be correct.
- 8.2.15 **Project No. 107906**, Northampton, LNW Route. A total of 115 SEUs were reported in the P3e database. 3 plans for this project were supplied, all of which were version C. The SEU count data provided in a separate spreadsheet were however based on version E of the plans. Based on the plans and data provided we were unable to match the 115 SEUs reported with those given in the plans. Further, the format and quality of the data supplied with the plans was not the same as that provided for the other 2 schemes audited.

## Assessment of confidence grade

- 8.2.16 **Reliability grade.** The definition is now defined in NR/ARM/M24 and the procedure for this measure is clearly documented. The adjustment for partial renewals is carried out at HQ where the details and the nature of the schemes may not be known exactly. However, the process is sufficiently linked to programme management to give a reliability grade of C.
- 8.2.17 **Accuracy grade.** The calculation of SEU renewed is open to a little interpretation, but should be capable of reasonable accuracy by following the procedure and using the agreed definitions. Out of the 3 schemes audited, we were unable to verify the reported SEUs for 1 scheme. We believe M24 should have an accuracy grade of 4.

## Audit Statement

- 8.2.18 We have audited the reliability and accuracy of the available data and commentary presented in Network Rail's Annual Return 2009. We confirm the data has been collected and reported in accordance with the relevant definition and procedure. The data has been assessed as having a confidence grade of C4. There is no regulatory target for this measure.

## Recommendations arising

### *Recommendations essential for the accuracy and/or reliability of the measure*

- 8.2.19 **M24 recommendation 1.** We recommend that the procedure document NR/ARM/M24PR be revised to take into account a situation as described in 8.2.13.

### *Observations relating to spreading of best practice and/or improvements to process*

- 8.2.20 **We have no observations for this measure.**

## 8.3 Structures Renewal & Remediation Volumes (M23, M26, M27, M28, M29)

### Audit scope

- 8.3.1 These audits were undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2009, Section 4, Structures Renewal & Remediation Volumes which comprises the renewals & remediation volumes for bridges (M23), culverts (M26), retaining walls (M27), earthworks (M28) and tunnels (M29), including Tables 4.14 – 4.20.
- 8.3.2 For bridges and earthworks, only schemes above £100k are reported, while for culverts, retaining walls and tunnels, schemes over £50k are reported.
- 8.3.3 The definitions and procedure for these measures are documented in:
- (a) NR/ARM/M23DF (issue 4);
  - (b) NR/ARM/M26DF (issue 3);
  - (c) NR/ARM/M27DF (issue 4);
  - (d) NR/ARM/M28DF (issue 2);
  - (e) NR/ARM/M29DF (issue 2);
  - (f) NR/ARM/M23PR (issue 2).
- 8.3.4 These measures have a common procedure and data collection process; we have therefore audited and reported on these measures together. The audit was undertaken with the Civils MP&I team in Swindon. We also undertook audits with the Civils Renewals teams at London North Eastern (in York) and Western (in Swindon) Routes.

### Commentary on reported data

#### Regulatory targets

- 8.3.5 There are no regulatory targets for these measures.

#### Trend

- 8.3.6 Figure 8.3.1 shows the total number of reported renewals undertaken for bridges, culverts, retaining walls, earthworks and tunnels since 2003/04, subject to the relevant cost thresholds.

Measure	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Bridges (M23)	195	260	157	154	201	358
Culverts (M26)	9	16	9	10	25	33
Retaining Walls (M27)	9	10	10	7	7	15
Earthworks (M28)	146	106	76	68	107	157
Tunnels (M29)	13	38	39	19	22	44

Figure 8.3.1 Annual number of structures renewed (M23, M26-M29)

8.3.7 The number of bridges, culverts, retaining walls, earthworks and tunnels renewals works undertaken (greater than the threshold values) rose in 2008/09, as compared to 2007/08.

8.3.8 Figure 8.3.2 shows bridge renewals and remediation by task category (for schemes over £100k) undertaken for the last 6 years. The number of schemes has increased significantly in 2008/09. Network Rail have stated that the increase is primarily due to additional projects over the scheme value threshold being delivered through minor works and programmes of work which were indicated as a single line entry in the business plan. Routes have now been given instructions to raise a new line entry through the change control process to identify all projects over £50k as a single line entry in the business plan.

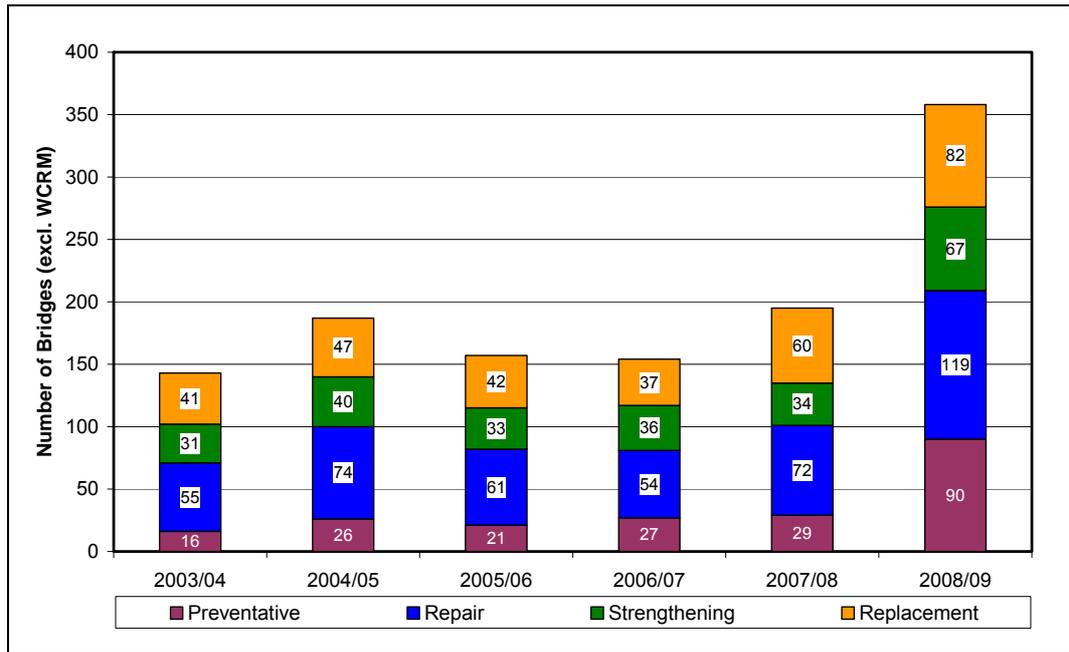


Figure 8.3.2 Bridge renewals by task category (M23)

8.3.9 Figure 8.3.3 shows the area (in terms of square metres) of bridge deck renewals (M23) and retaining wall remediation (M27), for schemes over the reporting thresholds.

Work Type	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Bridges (M23)	5,611m <sup>2</sup>	10,222m <sup>2</sup>	5,433m <sup>2</sup>	13,040m <sup>2</sup>	25,658m <sup>2</sup>	12,046m <sup>2</sup>
Retaining Walls (M27)	8,811m <sup>2</sup>	2,635m <sup>2</sup>	2,016m <sup>2</sup>	2,240m <sup>2</sup>	17,450m <sup>2</sup>	5,922m <sup>2</sup>

Figure 8.3.3 Area of works renewed (M23, M27)

- 8.3.10 There has been a 53% decrease in the area of bridge deck replacements undertaken in 2008/09 as compared to the previous year. Network Rail has stated that this was due to 2 specific projects with very large deck area which were completed in 2007/08. The area of retaining walls renewed showed a 66% decrease in 2008/09. Network Rail hasn't given an adequate explanation as to why this has reduced so significantly, even though the number of schemes has doubled. It must also be noted that in the 2008 Annual Return the total area of retaining walls renewed was given at 1,313 m<sup>2</sup>, while the figure for 2007/08 is now given as 17,450 m<sup>2</sup>.

## Audit findings

### *Process*

- 8.3.11 The data for the Annual Return is taken from the Cost Analysis Framework (CAF). The Programme Commercial Managers in the territories are responsible for data entry into the CAF. They have to complete the CAF return within 16 weeks, therefore there is a time lag between project completion and it being reported in CAF. Network Rail therefore reports the following data for the 2009 Annual return.
- (a) Periods 1 to 9 for 2008/09: From CAF Return
  - (b) Periods 10 to 13 for 2008/09: From Business Plan
- 8.3.12 Volumes are reported through the P3e database. Territory Civil Engineering teams verify that the volumes are accurate and categorised correctly. After each territory submits their CAF return, data for individual projects are collated and populated into a summary spreadsheet by the Programme Efficiency Analyst.
- 8.3.13 The Programme Efficiency analyst in Swindon also checks the data CAF against that in the business plan. The business plan is a dynamic document, updated every period. A lot of internal changes had been made during 2008/09, with the CAF template being simplified. It has been redesigned to fit into one page only. This was launched at the end of February 2009, so the problem in 2008/09 was that there were different spreadsheet formats from which CAF data had to be collated. In February 2009 the CAF reporting was brought 'in-house' within Civils, rather than being done by the estimating teams.

### *Accuracy of reported data*

- 8.3.14 For the audit we compared the data in CAF or business plan (where appropriate) for the numbers of projects undertaken for each measure and ensured that they were accurately reported. This was confirmed for all measures. We also audited the summary spreadsheet used to compile the Annual Return data from CAF and found it to be accurate.
- 8.3.15 For each measure, we selected a sample of individual schemes and compared the reported volumes and costs with the baseline business plan (2008/09). The data was found to be accurately recorded.
- 8.3.16 We undertook an audit of a sample of schemes in 2 Routes – London North Eastern and Western. This included a review of the construction and as-built drawings to check whether volumes/area renewed matched those given in CAF. For the Western Route, 4 schemes were selected, and for all of them the square area in CAF matched those in the as-built drawings and the Annual Return. For the London North Eastern Route, 4 schemes were selected, and for all of them the square area in CAF matched those in the as-built drawings and the Annual Return.
- 8.3.17 The Estimators in the Routes did state that there was still some confusion around how certain quantities of work should be measured. This was despite Network Rail issuing a "Cost and Volume" booklet in 2007/08.

### Assessment of confidence grade

- 8.3.18 **Reliability grade.** The definitions for these five measures are clearly documented. A single documented process has been followed to collect and report the data for these measures. We believe that the measures M23, M26, M27, M28, and M29 should have a reliability grade of A.
- 8.3.19 **Accuracy grade.** We audited a sample of individual projects in 2 Routes. Of the 8 schemes audited, the square area reported for all schemes matched those in the as-built drawings. We believe that the measures M23, M26, M27, M28, and M29 should have an accuracy grade of 2.

### Audit Statements

- 8.3.20 We have partially audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2009 for civils renewals and remediation measures (M23, M26, M27, M28 and M29). We can confirm the data has been collected and reported in accordance with the relevant definition and procedure. The data for measures M23, M26, M27, M28 and M29 has been assessed as having a confidence grade of A2. There are no regulatory targets for these measures.

### Recommendations arising

#### *Recommendations essential for the accuracy and/or reliability of the measure*

- 8.3.21 We have no recommendations for this measure.

#### *Observations relating to spreading of best practice and/or improvements to process*

- 8.3.22 We have no observations for this measure.

## **9 Audit report and commentary – Safety and Environment**



## 9.1 Safety

9.1.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in the Network Rail Annual Return for 2009, Section 5, Safety and Environment, including Tables 5.1 – 5.6.

9.1.2 The measures reported are principal Safety KPIs. These being:

- (a) **Workforce Safety.** This is measured by a workforce accident frequency rate (AFR), the number of RIDDOR reportable fatalities and injuries normalised by the number of hours worked. In 2008/9 a new measure was introduced using the number of Fatalities and Weighted Injuries (FWI). This covers all workforce fatalities and injuries, weighted according to severity. Previously the measure had been concerned with the number of personal accidents regardless of severity. The new measure does not include minor injuries that did not result in lost time; these are small in number and significance and are less reliably reported and documented.
- (b) **Level Crossing Safety.** This measure records significant safety related incidents at level crossings. Incidents included in the measure are collisions between trains and road users and near misses with users. The number of incidents is normalised using the number of crossings.
- (c) **Wrong Side Infrastructure Failures.** This records the number of wrong side infrastructure failures that attract a risk ranking score of more than 50. Railway equipment is generally designed to fail safe in order to prevent further problems when a fault occurs. A wrong side failure is one where equipment fails in such a way as to bring about additional risk. There are two principal components of this measure. These are wrong side failures of signals or signalling equipment, and wrong side failures of physical infrastructure or its components (e.g. broken or buckled rails). The risk scoring system was not seen by the audit team. It is managed by the Infrastructure Maintenance Engineer, who provides the complete information set each period to Route performance teams. Reporting on the basis of the minimum score of 50, however, appears to be consistent.
- (d) **Category A SPADs.** A Category A SPAD is an incident of a signal being passed at danger (i.e. displaying a stop aspect) when that signal was correctly set at danger and in time for the train to stop safely at it.
- (e) **Irregular Working.** This measure reports the number of incidents where work was carried out in a manner that was in contravention of the standards, rules and instructions for the work concerned. Until 2008/9 the measure was termed Operating Irregularities and was concerned only with breaches of operational procedure. However, the name change reflects the widening of the scope to include staff involved in engineering activities. This is the first year that the new wider definition will be reported in the Annual Return. Reportable occurrences fit into a risk rank matrix at 16-19 or above. Strictly speaking the risk here is not scored by rather categorised. Probability and consequence scores are provided, and their allocated is documented in individual reports of which copies were obtained and found to be consistently applied. The scoring level actually reflect three severity levels as illustrated below in Fig. 9.1.1.

(f)

		Consequence	Severity	Ranking	
		0	L	M	H
Probability Ranking	A	A0	AL	AM	AH
	B	B0	BL	BM	BH
	C	C0	CL	CM	CH
	D	D0	DL	DM	DH
	E	E0	EL	EM	EH
	F	F0	FL	FM	FH
	G	G0	GL	GM	GH
	H	H0	HL	HM	HH
	I	I0	IL	IM	IH
	J	L0	JL	JM	JH
	K(i to vii)	K(x)0	-	-	-

	Incident Risk Description	SPAD Risk Tool approx. Equivalent
	Potentially severe	20+
	Potentially significant	16 to 19
	Low risk	< 16

Figure 9.1.1 Ranking matrix and severity levels used for Irregular Working reporting.

*Criminal Damage.*

9.1.3 This measure reports the number of malicious acts on or directly affecting Network Rail infrastructure, normalised per 100 route miles.

9.1.4 Audits were undertaken at Network Rail headquarters with supplementary audits on three Network Rail routes, these being Scotland, Sussex and Western.

**Commentary on Reported Data**

*Regulatory target*

9.1.5 There are no specific regulatory targets for any of the safety measures reported to the Annual Return. However, there is a general requirement on Network rail to deliver year on year improvements in safety. Therefore the trends in each reportable KPI are likely to be of significance.

### *Commentary*

- 9.1.6 The text commentary presented alongside the safety performance data describe a range of initiatives, processes and policy statements that was not seen during the course of the audit. The text does not generally refer to the background to the data presented. We have been able to analyse the background information for the date presented, and have received extensive assistance from the route and headquarters performance teams in this respect. In the case of the text, however, we are not in a position to comment on whether processes success tracking arrangements are in place for any initiatives described in the text.

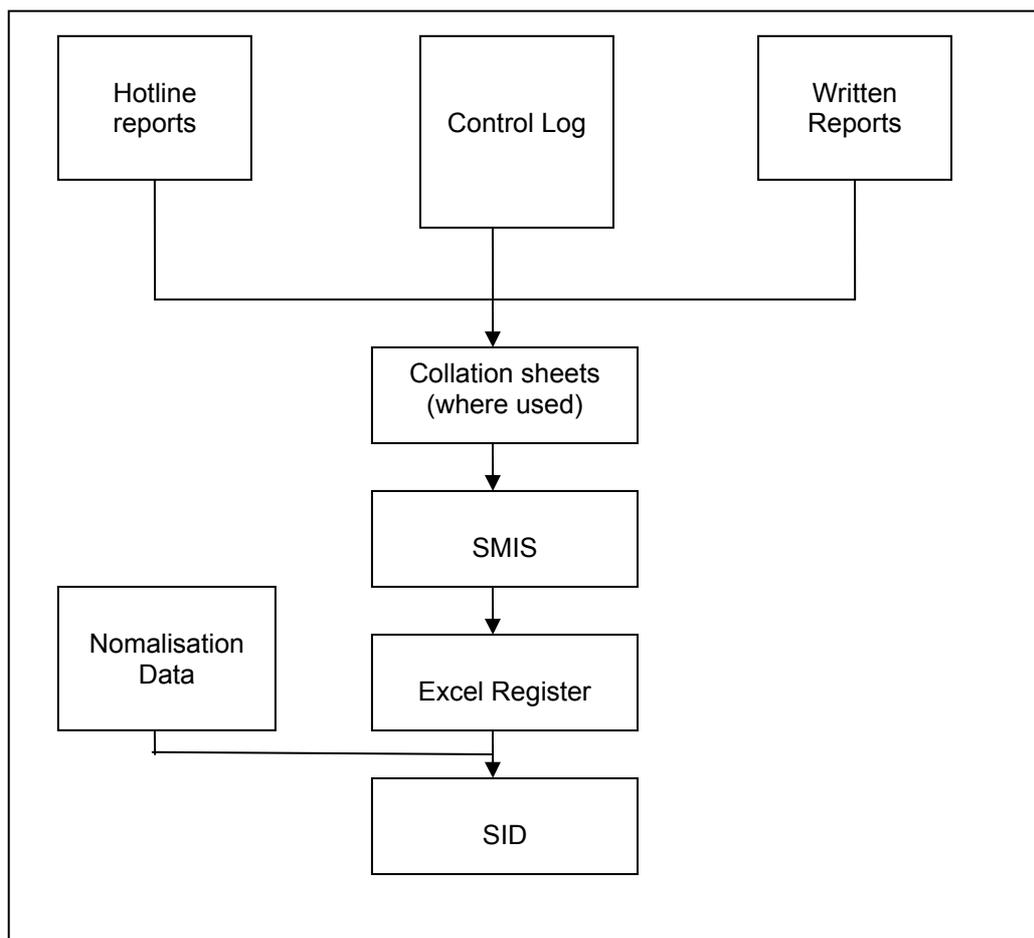
## **Audit Findings**

### *Process*

- 9.1.7 Railway Group Standard GE/RT8047, Reporting of Safety Related Information, gives clear instructions and guidance on incidents to be recorded and also mandates the reporting system.
- 9.1.8 A key element of the safety reporting system is the SMIS (Safety management Information System) database. SMIS derives information from control log entries and other reported information, some of which is specific to the incident types, and which are further described in section 1.1.11 below.
- 9.1.9 As well as being reported in the Annual Return the information gathered is also published at Route level in the Safety and Environment Assurance Reports (SEAR). SEAR reports provide route managers and others to be informed each period of the performance at its most recently measured point. As well as providing a snapshot each period the SEAR report also provides information on a route's performance to date in a viber year. Where it has been available SEAR report information has been used to check against other data sources.

### *Workforce Safety Data Accuracy*

- 9.1.10 Workforce Safety is calculated as the number of RIDDOR reportable accidents per 100,000 hours worked by staff and contractors in the delivery functions (e.g. operations and engineering). Reportable accidents are defined in accordance with the HSE Guide to the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR). Additional guidance for the rail sector is published by RSSB.
- 9.1.11 Data reported in SMIS is derived from control logs and from individual submitted accident reports. Control logs alone do not provide a complete picture as they generally report incidents in the train operating environment and engineering incidents or those taking place away from running lines may not be recorded here.
- 9.1.12 Figure 9.1.2 shows the basic process for collection and reporting of safety information.



**Figure 9.1.2 Process for collection and reporting of safety information**

- 9.1.13 The recording process is subject to a high level of manual notation, transfer and input. The SMIS events matrix provides clear guidance on the categorisation of incidents; it is therefore at this stage that the most critical categorisation process takes place and SMIS entry stage is likely to represent the earliest formal categorisation that is as accurate as it can be in terms of the reporting requirements. Nevertheless manual recording and transfer takes place at two stages prior to this so it is possible that SMIS data entry may reinforce any errors or omissions that have already been made.
- 9.1.14 SMIS input data is drawn from a mixture of control logs, post-event accident reports and accident hotline reports. Reports need to be checked against log entries in order to avoid double counting. Data input is done manually. While training and guidance is provided in use of SMIS and interpretation of information this stage is heavily dependent on the attentiveness and interpretation of individual members of staff. Generally the accidents reported in the control log appear to under-report the level of incidents. It should also be remembered that personal accident data is very much dependent on voluntary reporting. This should not be a problem for fatalities or major injuries, and for most minor injuries. However, it is very minor incidents could be under-reported and the AFR should not be interpreted as including them. The nature of the data is unable to indicate the level of any non-reporting.
- 9.1.15 Errors in recording and interpretation could take place in reporting, logging, report and log interpretation and SMIS entry. It was noted in one route's data that a small proportion of accidents were actually accidents to members of the public rather than workforce. This means there may be some over-reporting of accidents.

- 9.1.16 Hours worked data is the other key component of the Workforce Safety Measure. This comprises hours worked for both engineering and operations staff. Engineering staff hours are recorded each period and records of the reported hours are maintained along with e-mail trails. A significant proportion of operations hours will not take account of changes such as reduced or additional hours for engineering work, temporary events etc. This means that the operations component for hours is likely to be inaccurate.
- 9.1.17 Operations staff hours are in principle communicated once a year. However, in discussion with the routes it appears that operations hours have generally remained fixed for some time and that a single historic figure is used, generally dating back some years. There are some exceptions at route level where hours are provided period by period. Sussex Route does generate hour's data each period for staff based at the route's two managed stations. The Western and Scottish Routes relied entirely on historic figures that were not updated regularly. It is believed that the Western figure used dates from 2004. The age of the Scottish figure was not known.

#### *Level Crossing Safety Data Accuracy*

- 9.1.18 In 2008 a new measure was introduced concentrating on collisions and near misses, and omitting less serious misuse, which had previously also been reported. While this lowers the number of reported incidents in the Annual Return it was felt by Network Rail that reporting of less serious incidents was less robust and could be misleading, due to the tendency of reporting to be influenced by the presence of railway staff and the length of time since an accident or near miss was reported.
- 9.1.19 Notwithstanding the above, data in the SEAR reports still describes its reported data as misuse events, without being specific about the type of misuse event involved. We have assessed the reported misuse events and checked them against misuse and other events reported in control logs. The total number of collisions or near misses in a given period does match the SEAR report data, confirming that SEAR is reporting the current definition..
- 9.1.20 The SMIS data from which this information is derived continues to include incidents with less serious consequences although these are not reported in the Annual Return. A significant number of such incidents share similar precursor events to this which are reported. Therefore while the data may be more robust the Annual Return does not give a full picture of events with similar precursors that could have resulted in similar outcomes to those reported, if circumstances had been slightly different. Reports of misuse not resulting in collisions are still collated and followed up by the Operations Risk Control Co-ordinators.
- 9.1.21 It was noted that a number of control log entries, especially for Sussex, for incidents at level crossings where persons or vehicles had crossed in front of an approaching train were not reported as near misses by the driver. In many such cases it appears that the train driver has specifically stated that he does not wish to report a near miss. It is clear that the driver's judgement is relied upon to determine whether an incident has been a near miss and it is not clear to what extent drivers are encouraged to apply common criteria in making that judgement. It is therefore possible that there may be some inaccuracies resulting from the perceptions of the individual drivers involved. As the seasonal trends in incidents appear consistent with expectations the effect of this may not be great, but will mean that a certain fuzziness is inevitable in this data.

#### *Wrong Side Infrastructure Failure Data Accuracy*

- 9.1.22 Railway systems and equipment are generally designed to fail safe (i.e. fail in such a way that the safety of people and of railway operations is not compromised by the failure). Wrong side failures occur when such systems or equipment fail, counter to the design intent, in such a way that safety is compromised. An example would be a signal showing a green aspect when there is a fault that prevents the system from verifying whether the line is clear.

- 9.1.23 Wrong side failures are risk ranked in accordance with company standards. The Annual Return measure reports wrong side failures ranked above 50. The risk assessment is countersigned by the responsible engineer, this being intended to provide a check on the original risk ranking. Reporting and ranking of signalling wrong side failures longstanding and the routes audited all have established reporting and verification procedures.
- 9.1.24 Non-signalling infrastructure data is reported at national level, and reports and risk ranking examples have been provided along with examples of reporting on wrong side failures overall broken down by infrastructure type.
- 9.1.25 The situation at route level was found to be more variable, ranging from data being collected via data posted on Network Rail's intranet (Western), to data only being counted if train performance is affected (Sussex), to no data being collected (Scotland). The absence of non-signalling wrong side failures should not be significant in respect of the reported data in the Annual Return.
- 9.1.26 In Scotland non-signalling wrong side failures are not monitored. In Sussex only problems affecting performance are reported. On the Western, where non-signalling wrong side failures are in principle available, the three periods sampled show no such reported incidents. It was not possible determined as to whether this was due to a lack of reporting or a dearth of incidents.

*Category A SPAD Data Accuracy*

- 9.1.27 Source data for Category A SPADs should be drawn from SPADSYS with additional information also found in SMIS, which itself draws information from control centre logs and post-incident SPAD reports. Data has been checked at route level against SPAD report forms and SPAD alerts to verify consistency.
- 9.1.28 Data on the number of signals should be drawn from Ellipse, which is an asset registry system used by Network Rail. This number is taken as a given, and at route level is assumed to be unchanging unless advised otherwise in consequence of any resignalling schemes. This may not produce significant inaccuracies but may miss step changes in the normalising factor.

*Irregular Working Data Accuracy*

- 9.1.29 Irregular working entries into SMIS are drawn from control log entries and any separately reported incidents. It is not unusual for irregular working incidents to be hidden within log entries where the main content or description relates to something else. An example of this would be where an incident takes place within a possession in such a way as to delay or disrupt work. The log entry may concentrate of the consequences rather than the cause. Thus careful scrutiny of logs is needed and there is likely to remain the possibility that some incidents will be missed. Staff processing the data tend to express confidence that there is little under-reporting.
- 9.1.30 Incidents reported are risk ranked in accordance with a laid down ranking process. They are reported if the ranking falls into the category "16-19" or above.
- 9.1.31 Scottish data did not agree when comparing logged incidents and SMIS incidents. The number of incidents varied between the two accounts in the three periods sampled. Furthermore the SMIS data includes a small number of incidents that are incorrectly allocated. These include wrong routeing, technical failures, level crossing misuse and SPADs.

*Criminal Damage Data Accuracy*

- 9.1.32 The core source for data on criminal damage is control logs. In addition at least one route also uses driver reports or the logs of TOCs, though in this latter case not necessarily all relevant TOC logs to a given route are received.

- 9.1.33 There appears not to be consistency between routes as to what data is counted. One route generally records only those incidents where railway property was known to have been struck or damaged, but sometimes counts fly tipping, while another counted a wider range of railway crime incidents, including assaults and threatening behaviour, which goes beyond the reportable remit.

### Assessment of Confidence Grade

- 9.1.34 **Reliability Grade.** Textual and data records are generally good but there are examples of inaccuracies, owing to inevitable dependence on human interpretation. We therefore believe that the reported Safety data should have a reliability grade of B.
- 9.1.35 **Accuracy Grade.** Some categories have a high level of accuracy as clear and accurate systems of data collection are available (e.g. SPADs, Level Crossings, and Wrong Side Failures). However given the difficulties in ensuring accuracy of reporting and data for some categories (e.g. Irregular Working and Criminal Damage), we believe that the reported Safety data should have an overall reliability grade of 3.

### Audit Statement

- 9.1.36 We have audited the reliability and accuracy of Safety data and commentary presented in the Network Rail Annual Return 2009. The data has been assessed as having a confidence grade of B3.

### Recommendations Arising

*Recommendations essential for the accuracy and/or reliability of the measure.*

- 9.1.37 **Safety Recommendation 1.** Action must be taken to ensure that wrong side failure data collection for failures not related to signalling equipment is carried not overlooked if needed at Route level. It must be made clear to staff responsible for reporting and collation of information that this KPI is not solely concerned with signalling equipment.
- 9.1.38 **Safety Recommendation 2.** A procedure should be put in place to ensure Ellipse data on the numbers of signals is checked regularly to ensure that current reporting continues to be accurate.
- 9.1.39 **Safety Recommendation 3.** Staff collating and recording data for analysis and reporting should ensure that personal accidents counted towards the workforce safety measure do not include accidents to members of the public and not railway staff. Internal training and audit should seek to identify and mitigate the potential for any such errors.
- 9.1.40 **Safety Recommendation 4.** Network Rail should work to ensure as far as reasonably practicable that staff responsible for categorising level crossing incidents understand and apply the correct and clear categorisation and reporting of incidents. It should also ensure that safety performance data relating to level crossings accurately and consistently distinguishes between different types of crossing data, and in particular the exact type of misuse incidents covered by the measure.
- 9.1.41 **Safety Recommendation 5.** Network Rail should work to ensure that staff analysing route crime incidents understand and apply the correct categorisation of incidents, in order to minimise the risk of miscounting.
- 9.1.42 **Safety Recommendation 6.** The reporting of near misses, especially at level crossings, as reported in control logs is left to the driver's discretion. This may lead to arbitrary and therefore inaccurate reporting. Criteria should be agreed with train operators and briefed to all relevant staff as to what constitutes a near miss..

- 9.1.43 **Safety Recommendation 7.** The Level Crossing Safety measure should be clearly defined wherever it is published, and whether it is published wholly or in part, as being a measure of crossing collisions and near misses. It should be made clear that this measure does not count other crossing abuse or misuse. Management of reporting and of any relevant training and briefing should be used to reinforce this point.
- 9.1.44 **Safety Recommendation 8.** Improvement initiatives to be reported in the Annual Return, should be provided so as to ensure that that evidence for the underlying processes can be reviewed and reported on.

*Observations relating to the spreading of best practice and/or improvements to the process.*

- 9.1.45 **Safety Observation 1.** Any problems at Route level with lack of reporting of non-signalling wrong side failure may due to historic use of the definition. “Wrong side failure” originated as a signalling systems and equipment term to distinguish from failures where the systems or equipment failed safe as it was designed to do. It has only more recently been extended to cover failures of other types of fixed infrastructure and in the latter respect the relevance may be less well understood, which may explain lack of or under-reporting.

### **Progress on Outstanding Recommendations from Previous Audit Reports**

- 9.1.46 **2008 Safety Recommendation 1.** Doubts were expressed in the 2008 Annual Return Audit that the hour’s figures being used for the Workforce Safety measure were sufficiently robust. It appears that this issue has not generally been addressed, despite some routes clearly being able to establish some more accurate reporting of operational staff hours. We believe this issue should still be addressed so as to give greater confidence in this measure.

## 9.2 Environment

### Audit scope

- 9.2.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2009, Section 5, Safety and Environment, including Table 5.7.
- 9.2.2 In order to develop the Environmental Sustainability Index, data which demonstrates performance has been identified for use in the company's Key Performance Indicator (KPI) Programme. The Environmental Performance Indicators (EPis) that form the Index have been discussed at Corporate Responsibility Group and approved at the Executive Committee.
- 9.2.3 The performance targets are aimed at three environmental sustainability goals:
- (a) To achieve sustainable consumption and production;
  - (b) To improve energy efficiency and reduce the reliance on fossil fuels in running the railway; and
  - (c) To protect natural resources
- 9.2.4 The document NE/L2/ENV/050 Standard for Environmental Performance Indicators has been developed, and published in April 2009. It describes how data is collected as Environmental Performance Indicators (PIs) and brought together to feed into the Environmental Sustainability Index which is part of the Company's Key Performance Indicator (KPI) Programme.
- 9.2.5 The following environmental performance targets are being used or planned to be used:
- (a) Energy
    - (i) Non-traction: The number of kWh, gas and gas oil use and litres of light petroleum gas and diesel directly consumed by Network Rail (and directly by its suppliers), separated by traction and non-traction, and reported year on year (when available) against a 2006-07 baseline.
    - (ii) Traction data: The number of kWh and gas oil use directly consumed by train and freight operating companies. This information is currently unavailable to Network Rail. It will be reported to the ORR by individual Train and Freight operating companies.
    - (iii) Supplier Information: The number of kWh, gas and gas oil use and litres of light petroleum gas and diesel directly consumed by Network Rail's key suppliers. This information is due to be reported for the first time in 2010 Annual Return.
  - (b) Carbon dioxide emissions in tonnes of carbon dioxide equivalents (CO<sup>2</sup>(e))
    - (i) Non-traction: Level of CO<sup>2</sup> equivalents calculated for both traction and non-traction by applying the relevant conversion factors listed in Defra's greenhouse gas Company Reporting Guidelines to annual energy consumption data.
    - (ii) Employee Business Travel: Level of CO<sup>2</sup> equivalents calculated for travel by employees on business by applying the relevant conversion factors listed in Defra's greenhouse gas Company Reporting Guidelines to annual energy consumption data. This is the first year to report employee business travel.
    - (iii) Traction data: Level of CO<sup>2</sup> equivalents calculated for traction by applying the relevant conversion factors listed in Defra's greenhouse gas Company Reporting Guidelines to annual energy consumption data. This information is currently unavailable to Network Rail. It will be reported to the ORR by individual Train and Freight operating companies.

- (iv) Contractor Information: Level of CO<sup>2</sup> equivalents calculated for Network Rail's key suppliers by applying the relevant conversion factors listed in Defra's greenhouse gas Company Reporting Guidelines to annual energy consumption data. This information is due to be reported for the first time in 2010 Annual Return.
- (c) Expenditure on sustainable materials:
- (i) Percentage of total expenditure on wood versus that certified by the Forest Stewardship Council (FSC) and/or recycled or equivalent recognised by World Wildlife Fund.
- (ii) Expenditure on the following will be available during 2010/11; ballast, concrete, rail, oils and fuel oils, with reference to office paper from sustainable sources.
- (iii) Data for office furniture recycled or reused is planned for reporting for the first time in 2010.
- (d) Water
- (i) Use of deployable water from tunnels and water used by Network Rail
- (ii) The annual amount of water that is recovered for use from tunnel dewatering as a percentage of the total volume removed from tunnels.
- (iii) Total volume of water purchased by Network Rail
- (e) Waste
- (i) Non-track waste: Waste arising from the Network Rail managed stations, corporate offices and maintenance delivery units that is recovered, recycled or reused. This data will be reported for the first time in 2010 annual return.
- (ii) NDS: Waste recovered, recycled or re-used arising from renewals and enhancements, including track waste recovered or recycled by the NDS.
- (iii) Contractor Information: Waste recovered, recycled or re-used arising from renewals and enhancements, including track waste recovered or recycled by Network Rail's key suppliers. This information is due to be reported for the first time in 2010 annual return.
- (f) Reported Environmental Events
- (i) The number of environmental incidents (by total and those that are reportable under environmental legislation) during the year, measured year on year against the baseline of 2005-06.
- (ii) The number and percentage of graffiti sites identified during the year, cleaned during the year and the number of sites carried forward for cleaning to the following year.
- (g) Sites of Special Scientific Interest (SSSIs)
- (i) The percentage of SSSIs classified as favourable or recovering in England, Scotland and Wales.
- (ii) England is the only reportable country. Sites in Scotland and Wales are not yet classified by the relevant regulatory bodies. Work will be undertaken to understand the status of the Scottish and Welsh SSSIs during 2009/10.

## Commentary on reported data

### Regulatory target

9.2.6 The principal regulatory requirement for Network Rail is to have an environmental policy. However, within that Network Rail has also undertaken to develop and monitor key measures aimed at establishing meaningful reporting on the company's environmental performance.

## Audit findings

### Process

9.2.7 A new emphasis is to be put on environmental targets starting in CP4. These targets and the means of measuring and managing them have been in course of development and should apply from 1st April 2009. The following targets were stated as planned to be adopted:

- (a) A maximum of six environmental incidents per year in CP4
- (b) 95% of SSSIs (Site of Special Scientific Interest) in England to be in a positive condition by 2010. This objective encompasses 21 sites.
- (c) 10 miles of sustainable lineside to be established.
- (d) 20% reduction in CO<sub>2</sub> emissions from buildings.
- (e) Metering of electric traction energy use.
- (f) Sustainable materials policy affecting ballast, steel (rail), wood (sleepers), concrete, fuels, oils and paper.

### Accuracy of reported data and commentary

9.2.8 The audit was conducted with the HQ Environment Policy team. We have reviewed the commentary and the data provided by HQ as evidence of the data having been accurately collected. We were provided with Network Rail's 'Environmental KPI Dashboard', which contained all the Environmental KPIs and the supporting data. However, we were unable to audit any of the data sources for accuracy and reliability.

9.2.9 The Environmental Performance Table in the Annual Return 2009 lists a number specified targets and outputs. These are commented on below in the order in which they are presented in the table.

9.2.10 The collected numerical data is presented for a number of categories, and shown in Figure 9.2.1. Those which are not shown in Figure 9.2.1 are due to be reported on in 2010.

Environmental Performance	
Energy	<p><b>Non-Traction</b>                      Electricity- 463,234 MWh                      Gas- 68,647MWh                      Gas oil- 473cu m                      Petrol- 606cu m                      Diesel- 21,913 cu m                      Calor gas- 58 tonnes                      Aviation fuel- 189cu m</p>
CO2	<p><b>Non-Traction</b>                      Carbon footprint is 317,200t CO<sub>2</sub>(e)                      A reduction of 1% versus 2006/07 baseline</p> <p><b>Employee Business Travel</b>                      08/09 is the first year of reporting employee business travel which equates to 2304 tonnes CO<sub>2</sub>(e)</p>

Expenditure on sustainable materials	<b>FSC Wood</b> 97.4% of spend on wood was on FSC wood
Water	<b>Use of deployable water from tunnels</b> 1.8 million cubic metres was used in 08/09 which equates to 17.7% of the total removed  <b>Water use</b> 1.8 cubic metres (estimated from bills)
Waste	<b>National Delivery Service</b> Total waste managed is 2.1m tonnes 93% of which has been reused/recycled or recovered
Reported Environmental Events	<b>Incidents</b> 6 incidents were reported. This achieved the target.  <b>Graffiti</b> 892 reported, 20 which equates to 0.02% remain open
Site of Specific Scientific Interest (SSSIs)	<b>SSSIs England</b> Since 03/04 the figure has improved from 49.2% to 67.2%

Figure 9.2.1 . Reported environment figures for 2008/09

- 9.2.11 **Energy:** We have seen evidence for monitoring and reporting of this measure. Suppliers produce data for the responsible Network Rail representative. In circumstances where the data collection from suppliers may not be as clear as one would like, it is acknowledged. This data is then fed into the corporate system.
- 9.2.12 **Carbon Dioxide Emissions:** We have seen evidence for monitoring and reporting of this measure. Emissions are measured for Network Rail energy use, including business transport requirements. There are some limitations as there is as yet no means of measuring emissions related to staff travel paid for through the expenses system rather than booked by contracted providers. This in particular affects the figures for taxi journeys. Data is not yet fully available for traction emissions or those created by contractors. ATOC can provide passenger train data and the latter is expected to be reported from Q1 2009/10 and data collation and presentation structures are in place and have been seen by the audit team. For freight emissions to be provided, new agreements with or requirements upon FOCs need to be put in place. Figure 9.2.2 shows Network Rail's assessment of its total carbon emissions.

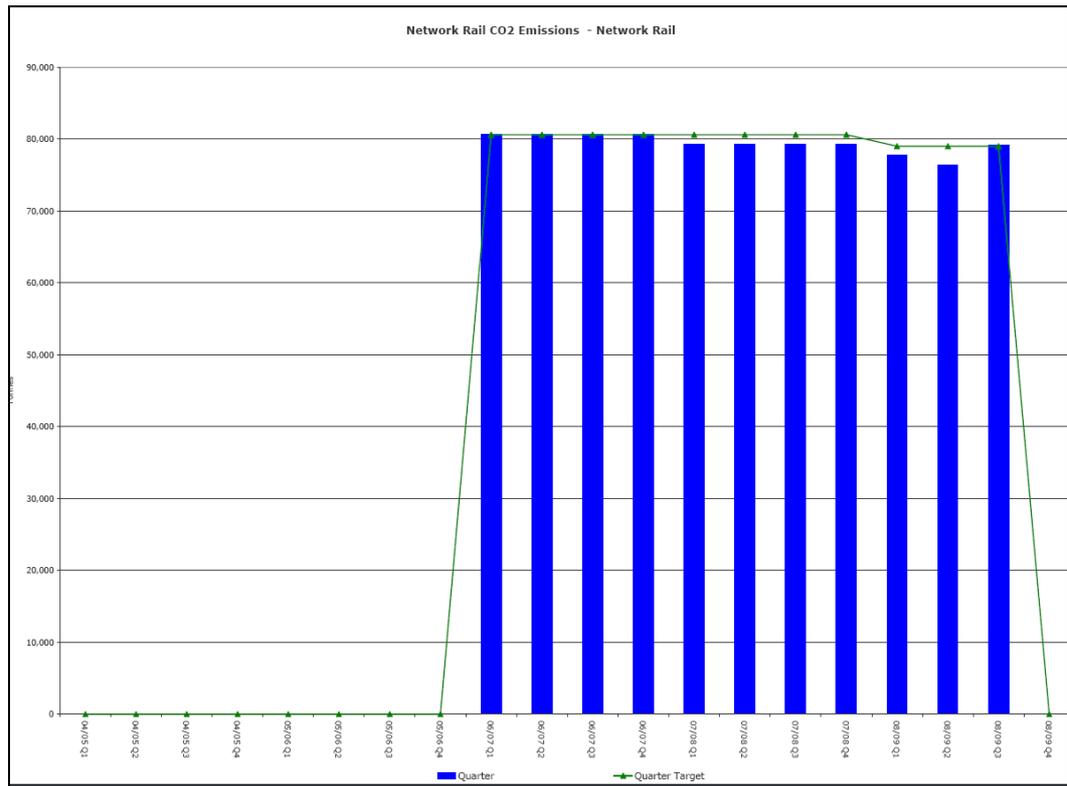


Figure 9.2.2 Network Rail total CO2 emissions.

9.2.13 **Expenditure on Sustainable Materials:** We have seen evidence for monitoring and reporting of this measure, which has now been taking place since Q1 2006/07 (Figure 9.2.3).

- (a) National Delivery Service (NDS) provides data of total spend and FSC spend. World Wide Fund for Nature (WWF) provides a report itemising purchases, those that are FSC approved, and volumes. Data is then transferred into the Corporate Dashboard.
- (b) An annual audit is carried out on the suppliers.
- (c) Construction Industry Research and Information Association (CIRIA) agreed the targets set for sustainable materials

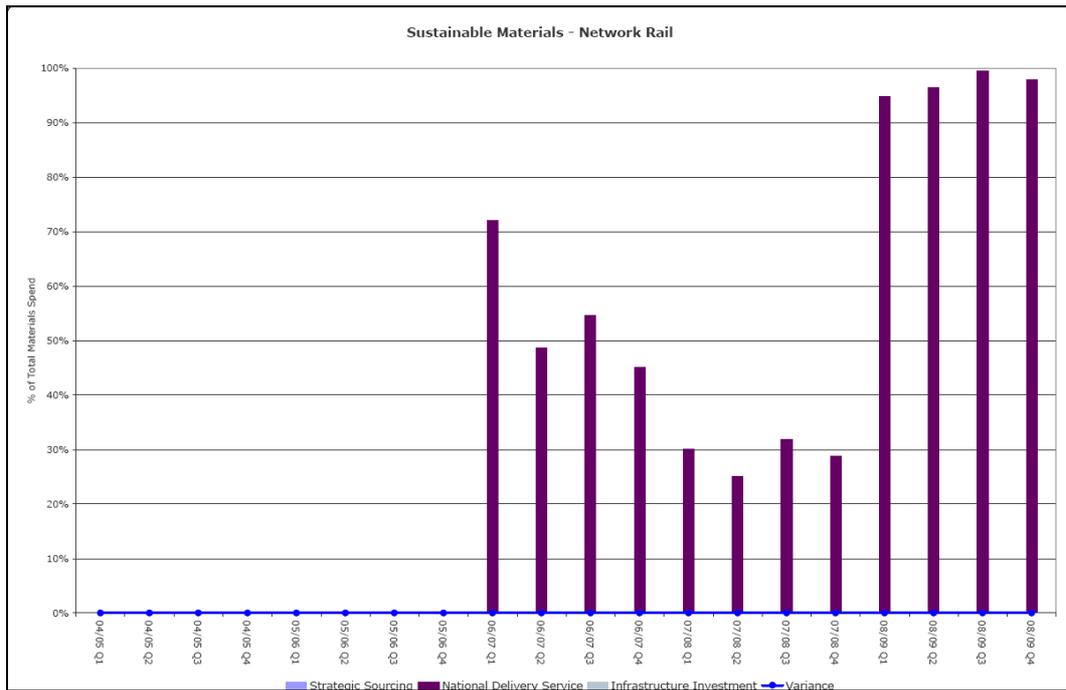


Figure 9.2.3 Network rail sustainable materials purchasing, Q1 06/07 to present.

9.2.14 **Water.** We have seen evidence for monitoring and reporting of this measure. Water used is given in Figure 9.2.4. Recovered water is measured and reported from Q1 2008/09, as given in Figure 9.2.5.

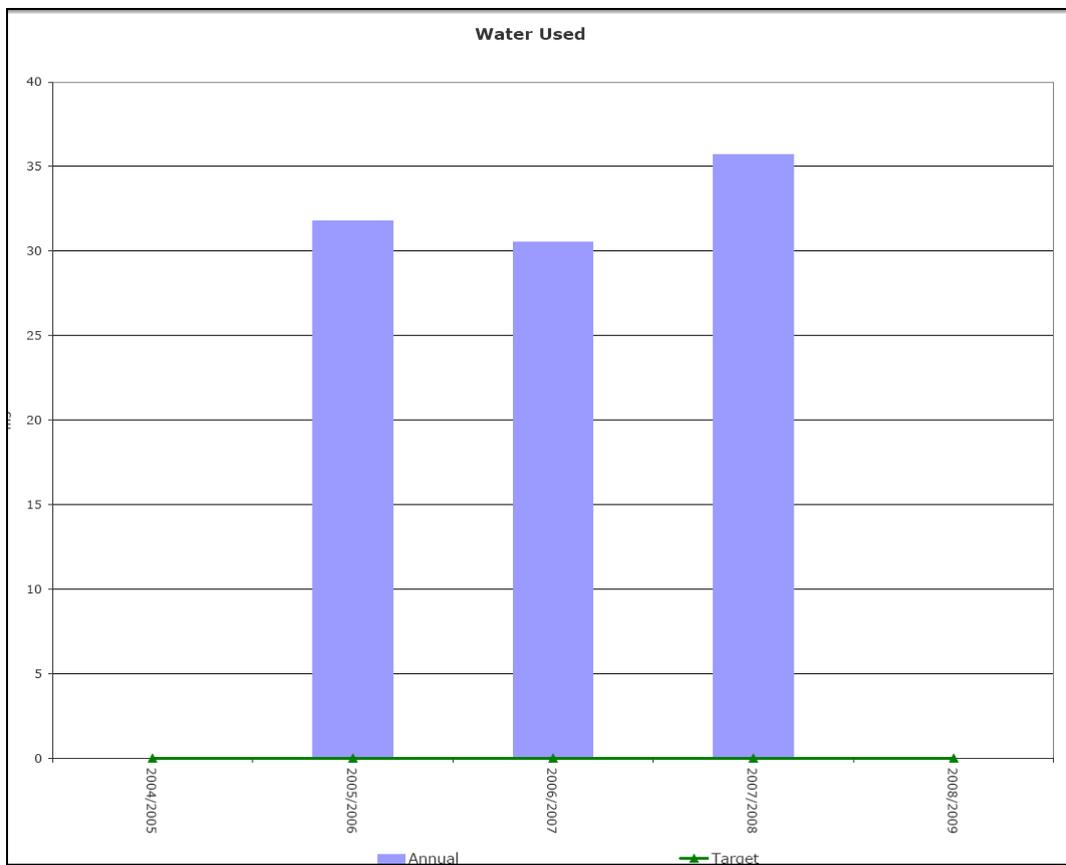


Figure 9.2.4 Network Rail water use monitoring in m<sup>3</sup>.

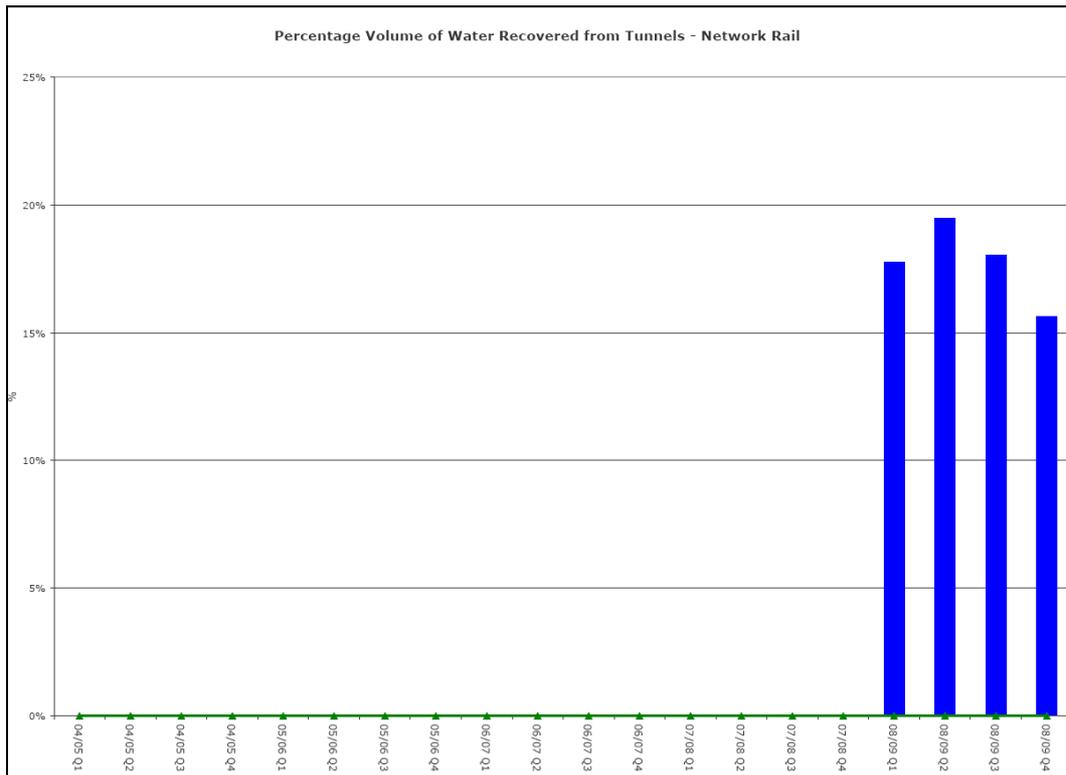


Figure 9.2..5 Network Rail percentage of tunnel water recovered.

9.2.15 **Waste.** We have seen evidence for monitoring and reporting of this measure, which has been measured and reported since Q4 2006/07, as given in Figure 9.2.6.

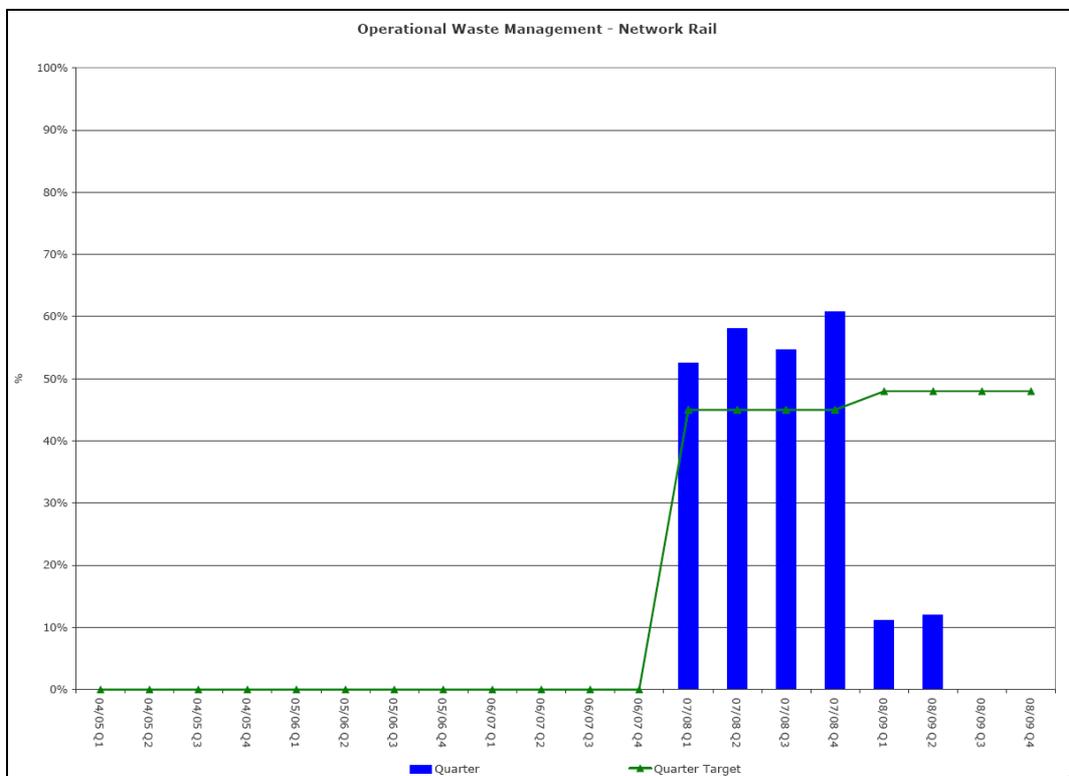


Figure 9.2..6 Network Rail waste management Q4 06/07 to present.

9.2.16 **Environmental Incidents.** We have seen evidence for monitoring and reporting of this measure.

(a) Incidents

(i) Safety and Environment Assurance Report (SEAR) contains both internal and contractor incidents. It contains information from the Control Centre Incident Logs (CCIL)

(ii) Network Rail review these logs and discuss the events with those responsible. It is then decided whether they will investigate the matter/qualifies as a reportable incident.

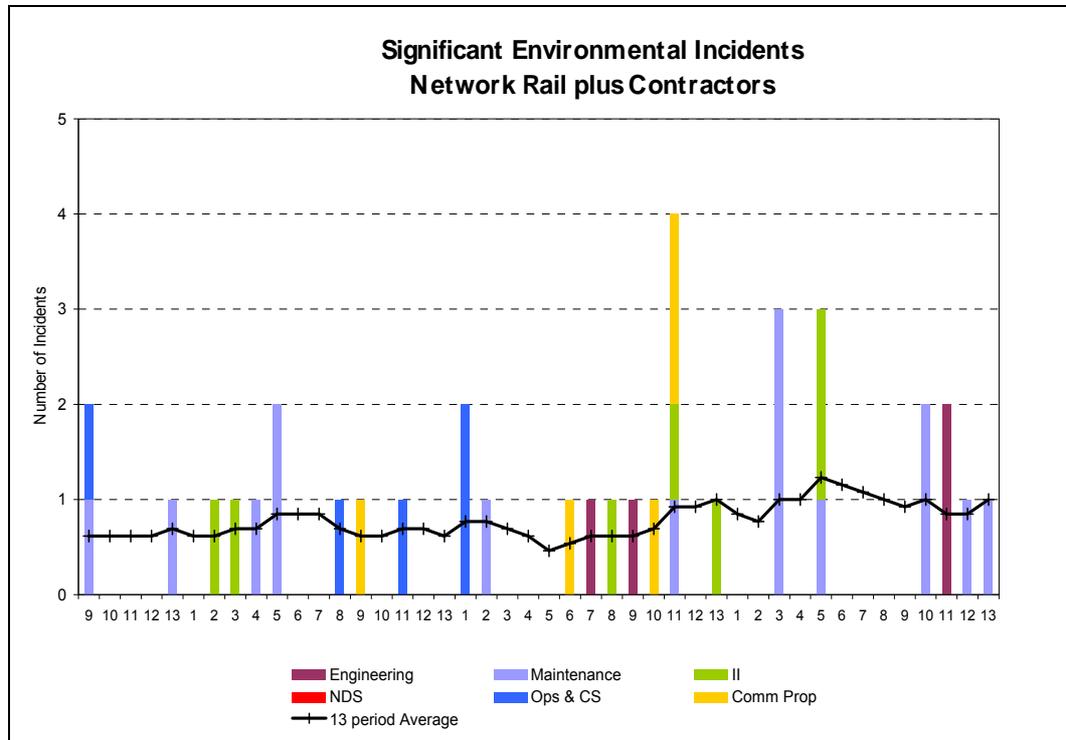
(b) Graffiti related enquiries

(i) Enquiries captured via the national help phone line, postal service and email address are logged into the Customer Relationship Management (CRM) system which is the source for the figures produced here.

(ii) The majority of enquiries relating to non-urgent graffiti are passed to the local Community Relations team who have the local knowledge required to assess which function will resolve the issue. They collate any necessary additional information (site maps etc.) and pass the details on to the resolving function within 2 working days of receiving the details.

(iii) Once the work is complete the resolving function notifies the Community Relations team who updates the CRM system and closes out the enquiry.

(iv) For emergency cases of graffiti (i.e. taking place next to live traffic at the point of call) or for cases of racist or obscene graffiti, the helpline will phone through to the relevant control office who will authorise the appropriate action to take place to remove the graffiti/handle the issue.



9.2.17 **SSSIs.** We have seen evidence for monitoring and reporting of this measure.

- (a) Natural England and Major Landowner Group (MLG) database provide information to be entered into the corporate system.

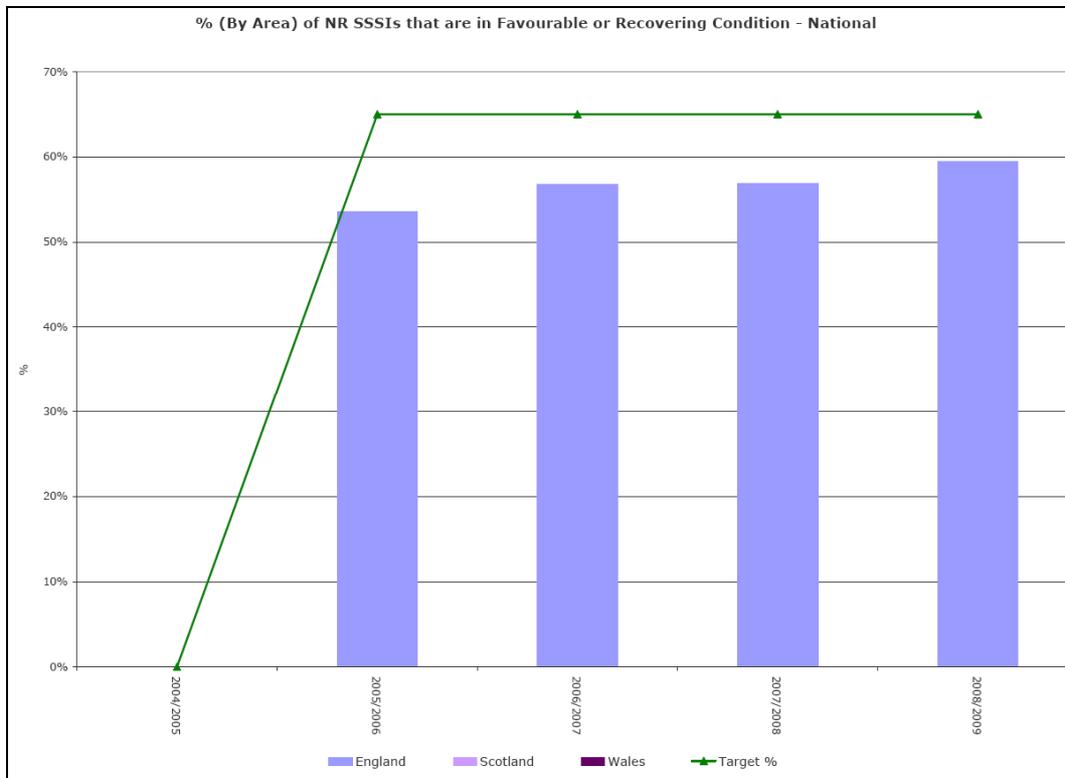


Figure 9.2.8 Network Rail SSSI recovery monitoring.

9.2.18 **Environmental Initiatives.** We had previously been aware of the National Pollution Prevention Programme and the Contaminated Land Programme. It had been hoped that it would be possible for sign-off or hand back documents to be viewed to confirm completion was as described. Unfortunately it has not been possible to obtain this information. We were not aware in advance of the reporting of Landfill Waste Management and are therefore unable to comment on this information in the Annual return.

### Training and competence

9.2.19 Although the data providers were aware that the environmental KPIs described herein had been developed most did not know what their particular targets were. However we were informed that a presentation had been given to those responsible identifying their particular KPIs.

### Assessment of confidence grade

9.2.20 **Reliability grade.** Given that measurements and systems are in place but still in some respects in their infancy, we do not think it appropriate to yet award the highest grade, particularly as there are known gaps in some measures at present. We believe therefore that Environment should have a reliability grade of B.

9.2.21 **Accuracy grade.** Given that data gathering is subject to known gaps (e.g. emissions) we believe that Environment should have an accuracy grade of 3

## Audit Statement

- 9.2.22 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2009 for the Environment measures. We can confirm the data collation systems are generally in place albeit some measures have yet to fully come on stream. The data has been assessed as having a confidence grade of B3. There is no regulatory target for this measure.

## Recommendations arising

### *Recommendations essential for the accuracy and/or reliability of the measure*

- 9.2.23 **Environment recommendation 1** It would be beneficial to carry out a briefing of the Level 2 Standard and KPIs to the responsible parties at all levels within Network Rail and the wider industry, and in the latter case most especially with the contractors and other stakeholders with a direct interest in the measures. This will help ensure understanding of the company's measured environmental deliverables.
- 9.2.24 **Environment recommendation 2.** Network Rail should continue to work with ORR and the FOCs to enable data on freight train emissions to be provided.

## Observations

- 9.2.25 **Environment observation 1.** The measured environmental indicators will take time to establish and therefore it is advised that information reported currently and in the immediate future be read and interpreted with care.

## Progress on outstanding recommendations from previous audit reports

- 9.2.26 Not applicable.

## **10 Audit report and commentary – Expenditure and Efficiency**



## 10.1 Maintenance Efficiency

### 10.1A Introduction

- 10.1.1 There is currently no single way of assessing Network Rail's performance in delivering maintenance efficiency against the regulatory target as:
- (a) Access Charges Review 2003 set annual maintenance efficiency targets for unit costs but did not set baseline volumes or baseline unit costs;
  - (b) Network Rail does not have maintenance unit cost measures with reliable datasets from 2003/04 to use as benchmarks.
- 10.1.2 Network Rail's maintenance efficiency is therefore assessed using budget variance analysis, which represents the difference between budgets and actual expenditure within each year. A portfolio of maintenance unit cost measures has been developed and started reporting in 2006/07 but these have not yet stabilised for the purposes of providing a benchmark and measuring efficiency.
- 10.1.3 The remainder of this section is split into two sections:
- (a) Maintenance budget variance, including an assessment of maintenance efficiency; and
  - (b) Maintenance unit costs, for 2007/08 and 2008/09.
- 10.1.4 Throughout this section, efficiencies are shown as positive values and inefficiencies are shown as negative values.

## 10.1B Maintenance Budget Variance

### Audit scope

- 10.1.5 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail’s Annual Return 2009, Section 7, Maintenance, including Table 7.3 and 7.4.
- 10.1.6 The maintenance budget variance measures comprise:
- (a) The variance between the pre-efficient allowance (from Access Charges Review 2003) and the actual expenditure;
  - (b) Maintenance expenditure normalised by Equated Track Miles (ETMs) in order to try to take account of changes in the network which affect maintenance costs. ETMs weight track miles using a number of factors, including lengths of different track types, numbers of S&C, linespeed and traffic tonnage (see section 0).
- 10.1.7 Audits were undertaken at Network Rail headquarters using the Regulatory Accounts and Asset Data Quality Report and ETM schedules.

### Commentary on reported data

#### Regulatory target

- 10.1.8 The regulatory target for CP3 efficiency savings is 34%
- 10.1.9 The results for 2008/09 show:
- (a) Variance against maintenance allowance is 31.5% which is slightly below target and
  - (b) 2004/05-2007/08 variance for maintenance expenditure normalised by ETMs is 34.5% which is slightly better than target.

#### Trend

- 10.1.10 Figure 10.1B shows the variance between regulatory target and ACR allowance is narrowing over the control period.

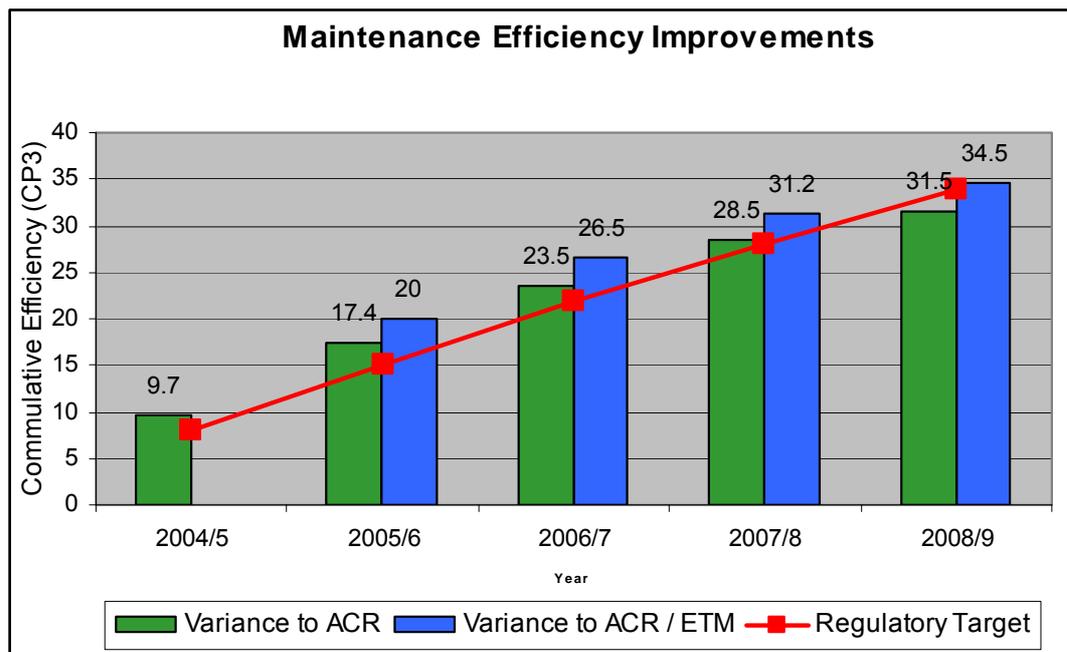


Figure 10.1B Maintenance expenditure efficiency savings

## Audit findings

- 10.1.11 The efficiency values are calculated using data from the Regulatory Accounts. The use of ETMs is a method for normalisation of the maintenance costs has been reviewed in previous reports (see notes on ETMs section 0). The ETM figure has increased by 4.6% over CP3 which accounts for the higher reported efficiency against the £/ETM.
- 10.1.12 The calculations are correct.

## Assessment of confidence grade

- 10.1.13 **Reliability grade.** The ratio is calculated using data from the Regulatory Financial Statements. We believe the maintenance budget variance measures should have a reliability band of A.
- 10.1.14 **Accuracy grade.** The calculation, using data audited by the Regulatory Auditor, is correct. We believe the maintenance budget variance measures should have an accuracy band of 1.

## Audit Statement

- 10.1.15 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2009 for the maintenance budget variance measures. The data has been assessed as having a confidence grade of A1.

## Recommendations arising

### *Recommendations essential for the accuracy and/or reliability of the measure*

- 10.1.16 We have no recommendations for this measure.

### *Observations relating to spreading of best practice and/or improvements to process*

- 10.1.17 We have no observation for this measure.

## Progress on outstanding recommendations from previous audit reports

- 10.1.18 There are no outstanding recommendations for this measure.

## 10.1C Maintenance Unit Costs

### Audit Scope

- 10.1.19 This review was undertaken to assess the reliability and accuracy of preliminary maintenance unit cost (MUC) data available for 2008/09 for Periods 7-13. Data for Periods 1-6 was not available due to the way Network Rail implemented the changes in cost codes in September 2008.
- 10.1.20 The full P13 data comprised of 42 MUCs, however we have focused our review on the 12 MUCs which were published in the Annual Return 2009.
- 10.1.21 The reporting definitions and procedures are documented in Network Rail Company Specification FRM702 Reporting of Maintenance Unit Costs. The definitions of the constituent standard maintenance jobs are referenced in this document.
- 10.1.22 The preliminary data has been subject to data quality control at delivery unit and area level, but not at a national level; Network Rail expects the preliminary data to contain outliers due to data quality issues.

### Commentary on reported data

- 10.1.23 P13 data has been provided for the various maintenance delivery unit (MDU) costs at Territory level but not at lower levels of disaggregation.
- 10.1.24 The 10.1C.1 below compares the 2008/09 P13 data with the twelve maintenance unit costs reported in the previous reports for 2007 and;
- (a) Rail changing: rail yards of plain line CWR or jointed rail replaced due to wear, corrosion, damage or defects;
  - (b) Manual spot re-sleepering: number of sleepers (irrespective of type) replaced;
  - (c) S&C unit renewal: number of single half set of switches or crossings (jointed or welded) renewed including associated closure rails;
  - (d) Replacement of S&C bearers: number of S&C bearers, irrespective of type and length replaced;
  - (e) Level 1 Track Inspections: track miles inspected
  - (f) S&C Arc Welds (no. of repairs)
  - (g) Arc Weld of Defective Rails (no. of repairs)
  - (h) Thermit Welding (no. of repairs)
  - (i) Manual correction of plain line track geometry: track yards of manual correction of plain line track geometry;
  - (j) Point End Routine Maintenance: number of point ends undergoing routine maintenance;
  - (k) Signal End Routine Maintenance: number of signals undergoing routine maintenance;
  - (l) Track Circuits Routine Maintenance: number of track circuits undergoing routine maintenance.

Measure	MUC's			% Change in MUC
	2008/09	2007/08	2007/8 (08/09 Prices)	
RAIL CHANGING	55	78	80	32
MANUAL SPOT RE-SLEEPERING	138	145	149	7
S&C REPLACE CROSSINGS & SWITCH 1/2 UNITS	8,817	8555	8812	0
REPLACEMENT OF S&C BEARERS	295	306	315	6
S&C ARC WELD REPAIRS	349	404	416	16
LEVEL 1 PATROLLING TRACK INSPECTIONS	54	47	48	-11
ARC WELD REPAIR OF DEFECTIVE RAIL	471	471	485	3
THERMIT WELDING	242	267	275	12
MANUAL CORRECTION OF PLAIN LINE TRACK GEOMETRY	18	15	15	-16
POINT END ROUTINE MAINTENANCE	59	58	60	1
SIGNALS END ROUTINE MAINTENANCE	61	49	50	-21
TRACK CIRCUITS ROUTINE MAINTENANCE	60	49	50	-18

Figure 10.1C.1 Maintenance Unit Cost data for 2008/09 and variance against 2007/8

- 10.1.25 The regulatory target for 2008/09 is 5%.
- 10.1.26 “% Change MUC” in the table above calculates efficiency improvement for each of the measures reported by Network Rail. Green shading indicates those measures which have achieved the target or above savings, yellow indicates those that have achieved below target savings. Red indicates measures that have increased in value over the period.
- 10.1.27 Of most concern is the net increase in four of the measures. A comment was made in the 2009 Annual Return that “*this is due to improvements in the way [NR] records and collects data*”. This implies that data collected in previous years was incorrect. In view of the fact that Network Rail are only reporting on 12 out of 43 measures, this does not imply confidence in the system.
- 10.1.28 However, in discussions with Network Rail Champion, the main explanation offered was “lower volumes of work reported than 2007/08” and “incorrect labour allocation”. This indicates to the Independent Reporter that there are still significant problems with the data collection system despite the recent reorganisation.

### Commentary on CP3 data

- 10.1.29 In 10.1C.2. below, we compare the current figures with previous years. The first year that MUC's were reported by Network Rail was 2006/07 so it is not possible to track these measures for the whole of CP3. In the annual return 2006/07, 9 measures were deemed by Network Rail to be sufficiently robust to be reported. The Table indicates, in the same manner as above, those measures that meet the savings target (>13% saving - shaded green). However, there are still some measures indicate an overall increase even over this period.

Measure	MUC's			
	2008/09	2007/8 (08/09 Prices)	2006/7 (08/09 Prices)	Average Change in MUC 2007- 2009
RAIL CHANGING	55	80	79	-43
MANUAL SPOT RE-SLEEPERING	138	149	152	-10
S&C REPLACE CROSSINGS & SWITCH 1/2 UNITS	8,817	8812	10480	-19
REPLACEMENT OF S&C BEARERS	295	315	288	3
S&C ARC WELD REPAIRS	349	416	0	
LEVEL 1 PATROLLING TRACK INSPECTIONS	54	48	42	21
ARC WELD REPAIR OF DEFECTIVE RAIL	471	485	0	
THERMIT WELDING	242	275	0	
MANUAL CORRECTION OF PLAIN LINE TRACK GEOMETRY	18	15	15	17
POINT END ROUTINE MAINTENANCE	59	60	168	-183
SIGNALS END ROUTINE MAINTENANCE	61	50	115	-87
TRACK CIRCUITS ROUTINE MAINTENANCE	60	50	133	-122

Figure 10.1C.2 Maintenance Unit Cost data for 2008/09 and variance against 2006/07

## Findings

### Changes to measures

- 10.1.30 The reporting definitions and procedures are documented in Network Rail Company Specification FRM702 Reporting of Maintenance Unit Costs. The definitions of the constituent standard maintenance jobs are referenced in this document. We were provided with the latest rev 9C of this document but this does not apply until 1<sup>st</sup> April 2009 and we would note that the document is marked "rev 9A".
- 10.1.31 There have various changes to the way the MUCs are calculated, for instance the Level 1 Track Inspections and Mechanised Visual Inspection were combined and have now been disaggregated. In other cases reported to us, the units of measure have been changed. These changes not only make year-on-year comparison difficult but also lead to possible errors in data collection as the staff becomes familiar with the changes.

### Changes to process

- 10.1.32 Halcrow and Network Rail have previously identified shortcomings in the levels of data quality being achieved, which we have highlighted in previous reports. Actions to overcome these shortcomings (tracked by Network Rail's 'World Class' programme) include:
- Reissue Network Rail Company Specification FRM702 Reporting of Maintenance Unit Costs – Version 9C issued but still in draft form; no formal document issue;
  - Issue of an Ellipse Manual – achieved;
  - Quarterly meetings of the BSMs are being held but this does not include the Ellipse staff (SSM);
  - Roll-out Oracle Projects for maintenance and a national labour appropriation system – this is working albeit it uses metric units of volume which can lead to confusion.
  - Develop new measures to incorporate over 50% of maintenance spend in maintenance unit cost regime – 46 measures created but most were not regarded as stable in 2008/09;
  - Move from reporting maintenance unit costs on a year-to-date basis to a rolling thirteen period basis – achieved.

10.1.33 We found evidence of considerable change management activity to improve the quality and coverage of the maintenance unit cost measures. The organisational changes and cost centres revisions in the past six months has caused a great deal of disruption.

*Data accuracy*

10.1.34 In 10.1C.3 below compares Route and National average maintenance unit costs:

(a) The data for each Route has been colour-coded to show the variance from the national average unit rate (red shading is more than 100% variation from the average or less than -100% variation from the average);

(b) The final column calculates the Coefficient of Variation which is the Standard Deviation of the Population divided by the Mean. This is an indication of the stability of the data. We have labelled any values above 100% as “unstable” and there are seven in that category, with twelve MUCs within a more acceptable range.

10.1.35 There is wide variation between the Route maintenance unit costs and the National average. Data quality has been discussed with the Network Rail Champion for this data but at the time of writing no explanation has been provided for the variances which are evident.

10.1.36 Based on the examples of templated costs for the MDUs assessed during this study, it is obvious that the costs for a specific MUC vary within a route and across the routes. There is no standard process method for completing a specific task and the requirements will vary due to geographic, access or technical reasons. Naturally, this variation may be due to an actual difference in unit cost (due to different work methods, different levels of work efficiency or different levels of procurement/cost efficiency) or a difference in data quality.

10.1.37 As part of our sampling, we requested further information on the anomalous figure (2,000%) for Arc Welded Repair of Defective Rail at Wessex. Network Rail’s explanation was that there was “Wessex have experienced some difficulty allocating the costs & volumes between the 3 welding MNTs”. By consolidating the three “welding” MUC’s, a more realistic unit costs has been calculated. However this confirms the Independent Reporter’s opinion that cost allocation at Area MDU level, continues to be a problem. This reorganisation occurred as part of the Phase 2A plan and has led to some problems in allocating the correct staff to specific MDUs.



## Assessment of confidence grade

- 10.1.38 **Reliability.** The processes used to source the data for this measure are documented at a high level, frequently used and subject to a number of layers of internal check and review; the financial data is subject to external audit by others. It has been identified that each of the regions interpret the process differently and thus part of the variations in cost is correct but it is not possible to analyse what variations are due to inaccurate reporting. The data should have an overall reliability grade of C.
- 10.1.39 **Accuracy.** There is evidence of systematic errors in some of the unit cost data. Since the full year's data has been received, relatively few of these errors have been corrected. The data should have an overall accuracy grade of 5.

## Statement

- 10.1.40 We have audited the reliability and accuracy of the data available in Network Rail's Annual Return 2009 for maintenance unit cost indices. The data has been assessed to have an overall confidence grade of C5.

### *Recommendations essential for the accuracy and/or reliability of the measure*

- 10.1.41 **MUC recommendation 1.** We recommend that the creation of area based MUC standard costings is rolled out across all Routes and that a National method of variance reporting is instituted.
- 10.1.42 **MUC recommendation 2.** We recommend that labour costs are captured independently to the timesheet system to avoid mis-charging of labour to specific MUC's

### *Observations relating to spreading of best practice and/or improvements to process*

- 10.1.43 **MUC observation 1.** The method for processing the maintenance unit cost and efficiency data before reporting, including the decision criteria for replacing collected data with estimated data, should be reviewed and subsequently formalised in documentation.
- 10.1.44 **MUC observation 2.** A systematic approach is required to eliminate data entry errors, such as automated error-checking (such as input masks) in Ellipse to eliminate entry of zero value or very low 'dummy' values (e.g. 1 minute in an 'hours worked' data field).

## Progress on outstanding recommendations from previous audit reports

- 10.1.45 We set out below our assessment on the current progress of Network Rail in addressing our outstanding recommendations for Maintenance Unit Costs from our previous Audits:

Recommendations made	Progress update
<p><b>2007-R43:</b> We recommend that responsibilities and accountabilities for the quality of data in Ellipse is reviewed, allocated and documented. This review should include inter alia the roles of recording data, approving data, inputting data, checking data, authorising data, reporting data, auditing data, improving data quality at Work Gang, Delivery Unit, Area, Territory and National levels.</p>	<p>The Phase 2a Maintenance Reorganisation was planned to deliver some or all of the intent of this recommendation.</p> <p>There is limited evidence so far that this reorganisation has improved the accuracy of MUC data.</p> <p><b>Current Status – In progress</b></p>

<p><b>2007-R44:</b> We recommend that (i) the data quality levels required in Ellipse are identified (and set as targets) in order to optimise the usefulness of the data and the level of resources required to maintain a given level of data quality; (ii) Ellipse data quality reports monitor the level of achievement against these targets; and (iii) MBR packs report the level of achievement against these targets so that those responsible can be held to account by management.</p>	<p>The current data quality reports produced by Maintenance NST do not have targets.</p> <p><b><i>Current Status – In progress</i></b></p>
<p><b>2007-R45:</b> We recommend that the work activities (inputs and outputs) and reporting activities should be described in sufficient detail to reduce the opportunity for local interpretation; this would most likely take the form of formal documentation, communication materials and staff training.</p>	<p>The Phase 2a Maintenance Reorganisation is planned to deliver an enhanced assurance and compliance regime for maintenance delivery, which may deliver the intent of this recommendation.</p> <p>There is limited evidence so far that this reorganisation has improved the accuracy of MUC data .</p> <p><b><i>Current Status – In progress</i></b></p>

**Figure 10.1C.4 Progress on outstanding recommendations for Maintenance**

## 10.2 Renewals Efficiency

### 10.2A Introduction

10.2.1 There remains single way of assessing Network Rail's performance in delivering renewals efficiency against the regulatory target as stated in previous year's reports. The reasons for this are stated below:

- (a) Access Charges Review 2003 set annual renewals efficiency targets for unit costs but did not set baseline volumes or baseline unit costs;
- (b) The few unit cost measures with reliable datasets including 2003/04 (which could be used as a benchmark against which to assess Network Rail's performance against the regulatory target) cover an insufficient proportion of the total renewals expenditure.

10.2.2 The Network Rail renewals efficiency is calculated in the same manner as last year, using a combination of unit cost indices (mostly with benchmarks more recent than 2003/04) and budget variance analysis. The calculation methods are defined below:

- (a) Budget variance analysis represents the difference between budgets (including contingencies) and actual expenditure within each year; this difference is categorised according to the type of efficiency which has delivered the variance;
- (b) Unit costs represent a 'pure' measure of efficiency, by comparing the cost of similar work activities between years:
  - (i) In order to compare like-with-like, unit costs do not assess the full budget for an activity.
  - (ii) Unit costs do not take into account volume efficiencies or other activity efficiencies.

10.2.3 The remainder of this section is split into the following four parts:

- (a) Renewals Unit Costs – Track;
- (b) Renewals Unit Costs – Structures/Civils, Signalling, Telecoms, Estates, Electrification and Plant;
- (c) Renewals Budget Variance;
- (d) Comparison of results with regulatory targets;

10.2.4 As last year percentage efficiencies are shown as positive values and percentage inefficiencies are shown as negative values.

## 10.2B Renewals Unit Costs – Track

### Audit scope

- 10.2.5 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2009, Section 7, Efficiency and Finance.
- 10.2.6 This measure reports:
- (a) Unit costs and unit cost indices for sixteen plain line track, three switch & crossings track renewal activities; each index represents the change in unit cost weighted by the volume of each activity in 2008/09; the indices are based on 2003/04 costs =100;
  - (b) Unit costs and unit cost indices for plain line track and S&C track and total track renewals, incorporating the costs associated with the constituent unit cost indices plus reactive renewals costs;
  - (c) Composite unit cost rates for renewals of plain line track (£/metre) and switch & crossings (£k/ equivalent unit) using weightings to reduce the impact of the mix of activities in the 2008/09 work bank; the rates are compared with 2003/04 cost benchmarks in 2003/04 prices;
  - (d) Percentage efficiency savings based on these measures, which can be compared with the regulatory targets for efficiency.
- 10.2.7 The audit was undertaken at Network Rail Headquarters with the Track Management Accountant.

### Commentary on reported data

#### *Regulatory target*

- 10.2.8 The regulatory target for 2008/09 efficiency savings is 29.7% (cumulative for Control Period 3; 2004/05=8%, 2005/06=8%, 2006/07=8%, 2007/08=5%, 2008/09=5%). Figure 10.1.2 shows an efficiency saving achieved for track renewal of 11.7%, this does not meet the regulatory target of 29.7%.
- 10.2.9 Our assessment of efficiency uses both unit costs and variance of outturn against budget, Network Rail's performance in comparison with the regulatory target is reported in subsection 10.2E below.

#### *Trend – unit cost indices*

- 10.2.10 73.2% of track renewals expenditure has been reported as unit costs. Figure 10.2.1 shows that over the portfolio unit rate efficiencies for track renewals have reversed since last year:
- (a) Plain line track renewal efficiency is up from 10.8% last year to 12.1% this year;
  - (b) S&C efficiencies are reported, up from 9.9% last year to 10.5% this year.

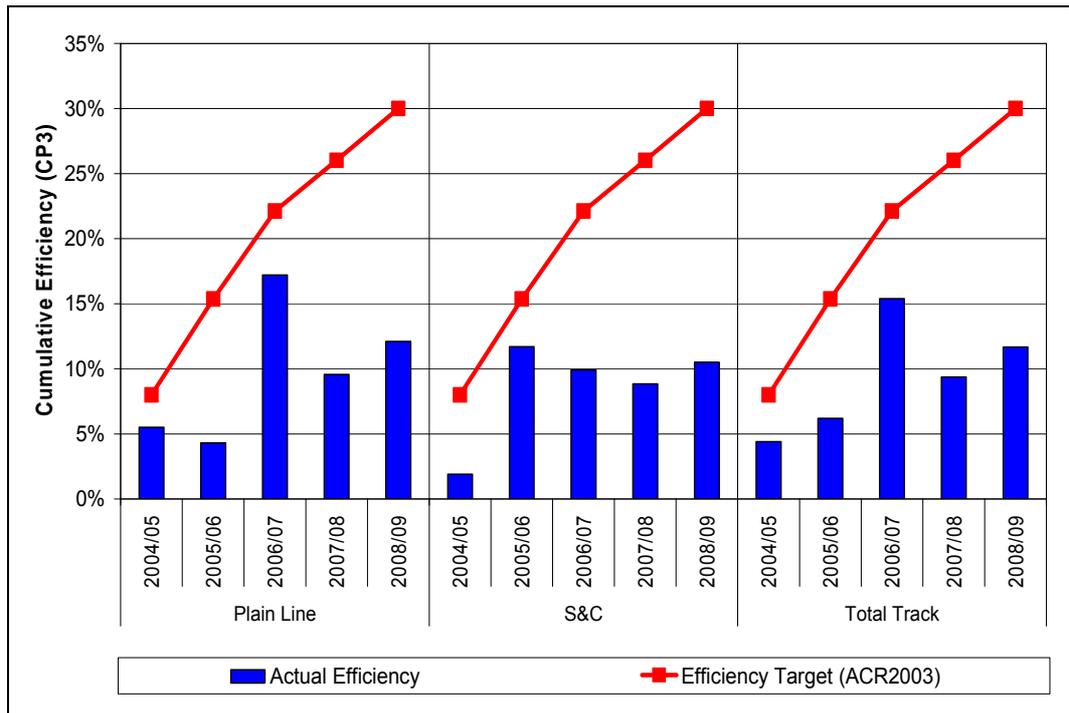


Figure 10.2.1 Efficiencies for Track Renewals (03/04 baseline)

Index *	04/05	05/06	06/07	07/08	08/09	Efficiency from 07/08	Efficiency from 03/04
Plain line	94.5	95.7	82.8	89.2	87.9	2.8%	12.1%
S&C	98.1	88.6	89.8	90.1	89.5	1.8%	10.5%
Total	95.6	93.8	84.6	90.4	88.3	2.5%	11.7%

Figure 10.2.2 Unit cost indices & Efficiencies for Track Renewals (\* 2003/04 = 100)

*Trend – composite rates*

10.2.11 Figures 10.2.3 and 10.2.4 show the composite rates for track renewals. Composite rates are calculated by weighting the constituent work activities (e.g. full renewal of S&C = 1, partial S&C renewal = 1/3) and by using the full track renewals spend, including central overheads. This means that:

- (a) The composite rates reflect work-mix efficiencies as well as unit cost efficiencies;
- (b) The assessment of overall efficiency for track renewals is more complete.

Composite Index*	04/05	05/06	06/07	07/08	08/09	Efficiency From 07/08	Efficiency from 03/04
Plain line	91.7	91.3	90.9	92.4	88.2	2.9%	11.8%
Switch & Crossing	89.5	79.6	80.8	82.0	76.6	5.1%	23.4%

Figure 10.2.3 Composite Rates & Efficiencies for Track Renewals

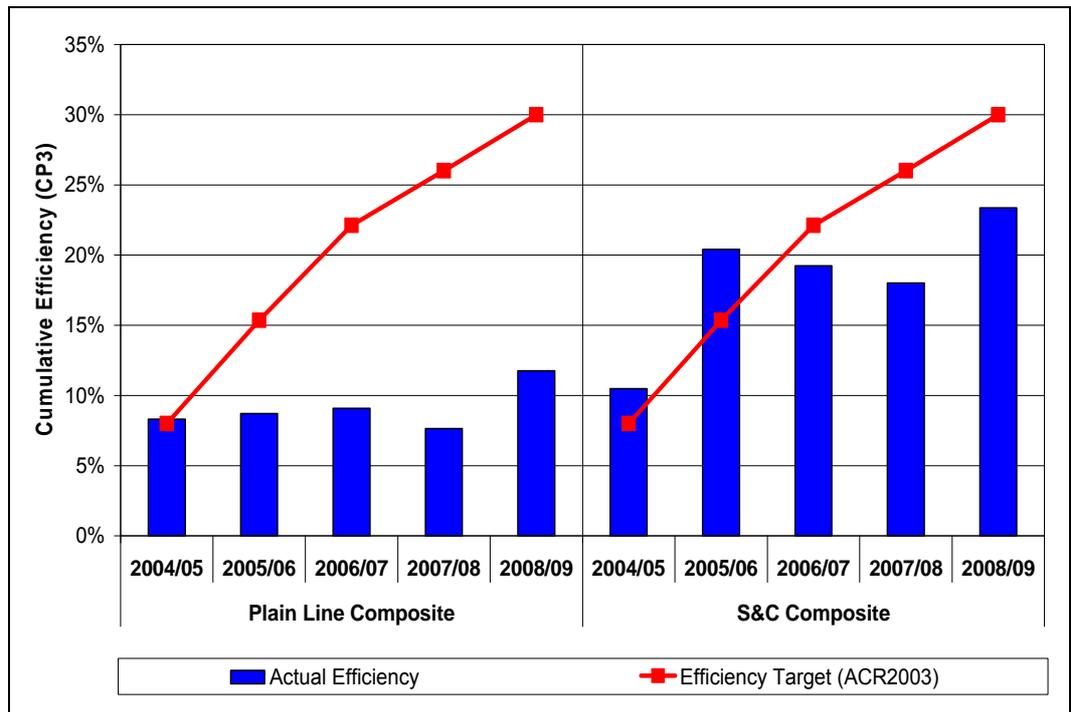


Figure 10.2.4 Composite Rates for Track Renewals (08/09 prices)

## Findings

### Process

- 10.2.12 Track renewals unit costs and composite rates are reported through the MBR process, as in previous years. This data is collected by Territory Track Renewals Programme teams on a 4-weekly basis and is consolidated on a national basis by the national Track Renewals Programme team and monitored by Director Track Renewals and Head of Track.
- 10.2.13 As in previous years any changes to the agreed business plan are jointly authorised within the national Track Renewals Programme team and Head of Track's team. Actuals and variances to the business plan are also monitored and reported through the MBR process.

### Data accuracy

- 10.2.14 The financial data is not solely based on final accounts for each track renewals project as it takes 12-16 weeks for the final accounts to be finalised, so any as in previous years those projects reporting completion for unit costs and composite rates in the final quarter may be subject to a small amount of variation. This also means that projects completed late Control Period 3 will be reported in Control Period 4.
- 10.2.15 **Price Base** – A desk audit of the calculation spreadsheets which show the RPI rates used by Network Rail in the calculation of unit costs rebased from 2003/04 to 2008/09 was undertaken. Last year it would found that there was an inconsistency between the percentages used between various asset areas. This year it was found that the civils/structure asset area used a rate of 18.30% and the signalling, electrification and plant and telecoms used a rate of 18.22%, with the former being consistent with the figure sourced from the Network Rail Finance team. Track calculation spreadsheets did not include any inflation for the 2008/09 in the unit cost index calculation to rebase from 2003/04 to 2008/09. Therefore the RPI rate used by track for 2008/09 was the same as that used for 2007/08 i.e. 13.82%.

### Assessment of confidence grade

- 10.2.16 **Reliability grade.** The processes used to source the data for this measure are documented, reviewed internally and externally as in previous years. The work-mix impacts the reliability of the efficiency results for the unit costs but is represented in the composite rates. We believe the unit cost indices and composite rates should have a reliability grade of B.
- 10.2.17 **Accuracy grade.** The processes used to source the data for this measure are frequently used and reviewed internally and externally as in previous years. The financial data is not solely based on final accounts, which may mean the reported data is subject to some inaccuracy. We have again found errors in the price rebasing, this year there has been no inflation applied for track for 2008/09 and the rates used between different asset areas vary. We believe the unit cost indices and composite rates should have an accuracy grade of 3.

### Audit Statement

- 10.2.18 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2009 for track unit cost indices and composite rates. The data has been assessed as having a confidence grade of B3.
- 10.2.19 So that our assessment of renewals efficiency can use both unit costs and variance of outturn against budget, Network Rail's performance in comparison with the regulatory target is reported separately below.

### Recommendations arising

#### *Recommendations essential for the accuracy and/or reliability of the measure*

- 10.2.20 **Renewals efficiency recommendation 1.** We recommend that NR use the same RPI rates for all assets areas and that these are consistent with those used by the Network Rail Finance team.

#### *Observations relating to spreading of best practice and/or improvements to process*

- 10.2.21 We have no observations for this measure.

**Progress on outstanding recommendations from previous audit reports**

Recommendations made	Progress update
<p><b>Track unit costs recommendation 1 -</b>                      We recommend that Network Rail agree with ORR the measures to be presented for measuring track renewals efficiency; we believe that track renewals unit costs remain a useful measure of trend monitoring.</p>	<p>This continues to be a recommendation  <b>Current status – In progress</b></p>

**Figure 10.2.5 Progress on outstanding recommendations for Renewals Efficiency**

## 10.2C Renewals Unit Costs – Structures, Estates, Electrification and Plant, Signalling & Telecoms

### Audit scope

- 10.2.22 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2009, Section 7, Efficiency and Finance.
- 10.2.23 The source data for this measure is Network Rail's Cost Analysis Framework (CAF) process. The data for this measure comprises:
- Unit costs for thirty renewal activities – nine for civils/structures, five for estates, five for signalling, six for telecoms and five for electrification and plant.
  - The percentage efficiency savings based on these measures which can be compared with the regulatory targets for efficiency.
- 10.2.24 The audit for Civils/Structures and Estates was undertaken at Swindon with the Financial Controller and Programme Efficiency Analyst. The audit for Signalling, Telecoms and Electrification and Plant was undertaken at Network Rail Head Quarters with the Senior Commercial Manager, Estimating Manager, Business Improvement Manager and Financial Controller.

### Commentary on reported data

#### Regulatory target

- 10.2.25 The regulatory target for 2008/09 efficiency savings is 29.7% (cumulative for Control Period 4; 2004/05 = 8%pa, 2005/06=8%pa, 2006/07=8%pa, 2007/08=8%pa, 2007/08=5%, 2008/09=5%). Network Rail's performance in comparison with the regulatory target is reported in subsection 10.2E below. This includes an assessment of efficiency against both unit costs and variance of outturn against budget

#### Trend

- 10.2.26 Figure 10.2C.1 shows that civils/structures efficiency has improved by 5.3% this year to 30.3% over Control Period 3. Telecoms efficiency has not improved this year therefore the figure for the Control Period 3 remains at 25.7%. Signalling efficiency has improved by 11.4% this year to give a 37.4% improvement for the Control Period and the electrification and plant efficiency is 18.2%. Civils/structures and signalling meet the regulatory target, however telecoms and electrification and plant do not meet the target.
- 10.2.27 Figure 10.2C.2 shows the range of data for each of the CAF unit costs; the graph has been ordered by mean value for ease of reference (unit costs to the left are more efficient than unit costs to the right of the graph; mean indexes less than 1.0 are more efficient than 2003/04 baseline).

Index (2003/04 = 100)	2005/06	2006/07	2007/08	2008/09	Efficiency from 07/08	Efficiency from 03/04
Civils/Structures	77.0%	74.7%	73.6%	69.7%	5.3%	30.3%
Electrification & Plant	n/a	n/a	n/a	81.8%	n/a	18.2%
Signalling	n/a	57.5%	70.6%	62.7%	11.2%	37.4%
Telecoms	n/a	85.4%	74.3%	74.3%	0%	25.7%

**Figure 10.2C.1 Unit Cost Indices & Efficiencies for Structures, Electrification and Plant and Signalling and Telecoms**

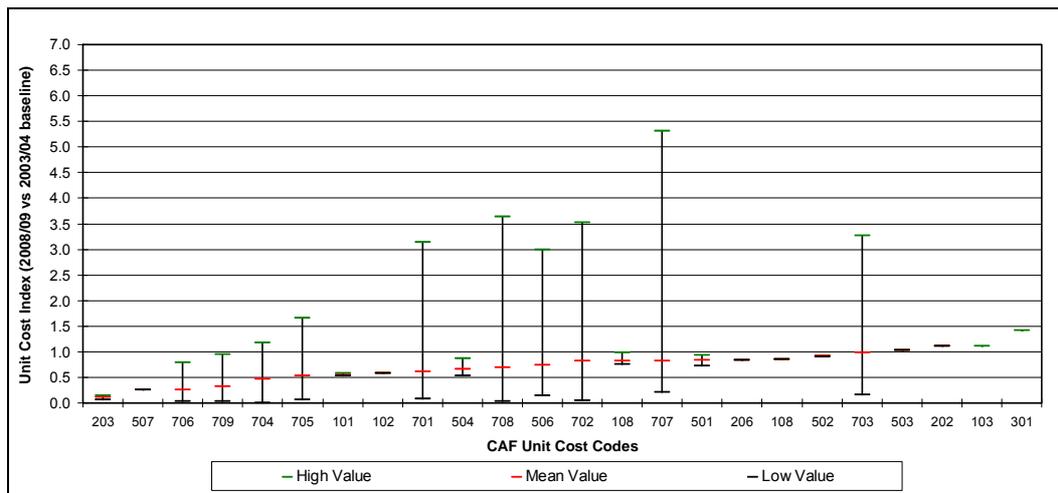


Figure 10.2C.2 CAF Renewals Unit Costs (03/04 baseline)

## Audit findings

### Process

- 10.2.28 The reporting of unit costs remains the same as last year and is as follows. Renewals unit costs are reported through the MBR process. This data is collected by Territory Renewals Programme teams on a 4-weekly basis and monitored by the relevant Directors of Renewals and Heads of assets. Changes to the agreed business plan are approved at Change Panels (where both the Renewals Team and Engineering are represented). Actuals, and any variances to the business plan, are monitored, explained and reported through the MBR process.
- 10.2.29 A number of changes have been made to the CAF reporting process in 2008/09; these changes will improve reporting coverage, accuracy and speed of reporting. The changes are summarised by Network Rail as follows:
- Streamlining of CAF templates
  - CAF reporting process bought in-house
  - Programme teams objectives aligned
  - CAF forecast and reporting published periodically
- 10.2.30 A sample of accepted and rejected CAF reports for civils/structures, electrification and plant, signalling, estates and telecoms have been assessed. The process used to accept and reject these CAF reports appears to be sensible.

### Data accuracy

- 10.2.31 **Final Accounts** - In order to increase data accuracy, the CAF unit costs are solely based on final accounts. As final accounts take 12-16 weeks to finalise, this means some projects completed in the last few periods of each year may be reported in the next year.
- 10.2.32 **Civils CAF** – It was reported last year that a low number of CAF returns (36%) were received for some territories and therefore there was concern as to the accuracy of the data reported. This year has seen a significant increase in CAF reporting and the majority of the backlog for 2007/08 has been submitted. Figures have been updated for 2007/08 in the data presented in the 2008/09 audit of the Network Rail Annual Report.

- 10.2.33 **E&P, Signalling and Telecoms CAF** – Network Rail pointed out that the CAF process at the current time is being refined to make it more suitable to the nature of the projects undertaken in the electrification & plant, signalling and telecoms teams. These projects tend to be high value and have a longer duration than the civils/structures and estates projects. At the current time the CAF process does not capture all the works that have been undertaken during that financial year due to some of the project durations spanning a number of years and sometimes a number of Control Periods. It was noted by Network Rail that the variance analysis is a better measure of work that has actually been undertaken in the year as this also takes into account work in progress.
- 10.2.34 **Outliers** - Civils/structures reported 5 outliers over the 2008/09 period and were able to provide adequate explanation as to why they were removed from the efficiency calculations. No outliers were reported by electrification and plant, signalling or telecoms, however it was explained that the process used in these teams eliminated the outliers prior to undertaking calculations as it was possible to do this with these assets due to the smaller number of projects in this areas compared to those in Civils/structures and estates.
- 10.2.35 **Price Base** – A desk audit was undertaken this year of the calculation spreadsheets which show the RPI rates used by Network Rail in the calculation of unit costs rebased from 2003/04 to 2008/09. Last year it was found that there was an inconsistency between the percentages used between various asset areas. This year we found that the Civils/structure asset area used a rate of 18.30% and the signalling, electrification and plant and telecoms team used a rate of 18.22%, this rate was consistent with the figure sourced from the Network Rail Finance team. Track however did not inflate their figures at all for 2008/09.

### Assessment of confidence grade

- 10.2.36 **Reliability grade.** The processes used to source the data for this measure are documented, frequently used and subject to a number of internal and external checks. There have been a number of changes in the process this year which are provided in the report. These should provide more reliable data in CP4. The work-mix and solutions type impact the reliability of the efficiency results for the unit costs. We believe the unit cost indices and composite rates should have a reliability grade of B.
- 10.2.37 **Accuracy grade.** The processes used to source the data for this measure are frequently used and subject to internal and external checks. The financial data is based on final accounts. We therefore believe the unit cost indices and composite rates should have an accuracy grade of 2.

### Audit Statement

- 10.2.38 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2009 for Civils/Structures, Signalling, and Telecoms unit cost indices. The data has been assessed as having a confidence grade of B2.
- 10.2.39 So that our assessment of renewals efficiency can use both unit costs and variance of outturn against budget, Network Rail's performance in comparison with the regulatory target is reported separately below.

### Recommendations arising

#### *Recommendations essential for the accuracy and/or reliability of the measure*

- 10.2.40 **Renewals unit costs recommendation 1.** We recommend that Network Rail use the same RPI rates for all assets areas and that these are consistent with those provided by the Network Rail Finance team.

#### *Observations relating to spreading of best practice and/or improvements to process*

- 10.2.41 We have no observations for this measure.

## Progress on outstanding recommendations from previous audit reports

10.2.42 There are no outstanding recommendations for this measure.

## 10.2D Renewals Budget Variance

### Audit scope

- 10.2.43 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2009, Section 6, Budget Variance Analysis, including Table 6.37.
- 10.2.44 This measure reports budget variance analysis for renewals expenditures, categorising all changes in budget during the year between activity efficiency, changes in the scope of work necessary to deliver the outputs, and deferral of planned activity into later years. It supplements the unit cost information in the assessment of Network Rail's efficiency savings.
- 10.2.45 The documentation for this measure (Investment Budget Variance Reporting Guidelines version 2.1b, Network Rail, 20 December 2007) sets out the process, requirements and definitions for its collection and worked examples. We undertook a desk audit of the renewals variance attributions for Track.

### Commentary on reported data

#### Regulatory target

- 10.2.46 The regulatory target for 2008/09 efficiency savings is 29.7% (cumulative for Control Period 3; 2004/05=8%, 2005/06=8%, 2006/07=8%, 2007/08=5%, 2008/09=5%). So that our assessment of efficiency can use both unit costs and variance of outturn against budget, Network Rail's performance in comparison with the regulatory target is reported in subsection 10.22E below.

#### Trend

- 10.2.47 The total renewals budget shows a 24% level of efficiency, only telecoms and estates met the regulatory target when looking at the figures provided by the Network Rail Finance team, however looking at the figures reported by the asset team's civils/structures would also meet the regulatory target. Both civils/structures and signalling come close to the target when looking at the data reported by the Network Rail Finance Team. Track and electrification and plant were well below target for figures reported by the Network Rail Finance team and the asset teams.
- 10.2.48 The discrepancy that has been seen in the figures that have been reported by the Finance team and those that are reported by the individual asset areas are shown in table 10.2D.1 below. The track asset area did not report a level of efficiency. The figures in brackets show the figures reported by the individual asset areas.

Category	2004/05(%)	2005/06(%)	2006/07(%)	2007/08(%)	2008/09(%)
Track incl. high output/ modular S&C	6	9.6	14.6	11.8	16.0 (Not reported)
Signalling	14	29.7	26.3	20.9	28.5 (28.5)
Civils/Structures	12	26.6	20.8	26.9	29.3 (30.4)
Electrification, Plant & Machinery	7	37.7	26.3	18.0	18.9 (18.9)
Telecoms	12	17.8	36.3	32.2	34.4 (34.4)
Estates	8	24.1	33.5	17.8	30.7(30.8)
<b>Core renewals efficiency</b>	<b>9%</b>	<b>18.1%</b>	<b>22.1%</b>	<b>18.3%</b>	<b>24%</b>

Figure 10.2D.1 Core renewals efficiency savings (03/04 baseline)

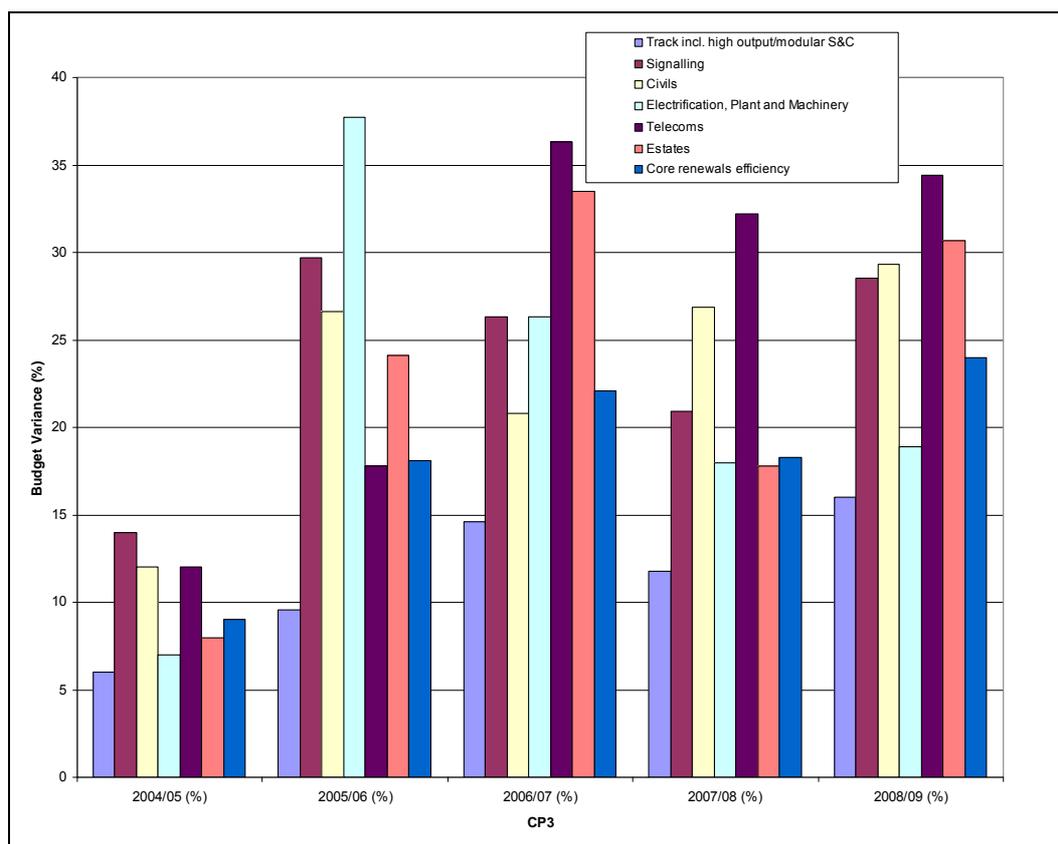


Figure 10.2D.2 Core renewals efficiency savings for assets (03/04 baseline)

10.2.49 Figure 10.2D.2 shows the core renewals efficiency savings for track, signalling, civils, electrification, plant and machinery, telecoms and estates.

## Audit findings

### Process

- 10.2.50 The process remains the same as in the previous years; the annual core renewals budgets are set on the basis of meeting the overall efficiency improvement target as set out in the ORR Access Charges Review 2003.
- 10.2.51 Renewals project budgets are tracked during the year using Oracle Projects and Budget Variance Analysis spreadsheets:
- Forecast variances** between the full-year forecast and current annual budget are automatically reported in Oracle Projects;
  - Banked variances** between the year-commencing budget and the current annual budget are recorded manually by Infrastructure Investment teams using Budget Variance Analysis spreadsheets.
- 10.2.52 Change control processes are used to authorise budget changes and/or movements in expenditure and attribute them to a variance category. This also ensures that evidence is available for the annual audits; authorised change request forms are used to support variance attribution.
- 10.2.53 Variances are reported in the MBR with variances greater than £250k including a commentary; variances less than £250k are rolled-up and reported as consolidated figure.

- 10.2.54 The actual and budgeted figures in the separate variance sheets held in the asset areas could in most cases be directly linked to the summary of variances sheet held by the Network Rail Finance team. However these figures do not correlate to the 'Delcap Actual' and 'Delcap Budget' figures (the official figures for delivered capital spend within Network Rail) and those used to report the Renewals Budget Variance for the Network Rail Annual Return.
- 10.2.55 The 'Full Year Actual' and 'Full Year Budget' figures calculated from a summation of the various work groups in Network Rail that was also held by Network Rail Finance did not correlate to the 'Delcap Actual' and 'Delcap Budget' figures either. This issue was raised with Network Rail Finance and the reason they provided for this was due to the vast number of packages making up the total asset figures there was a discrepancy in figures.
- 10.2.56 Network Rail have chosen to use the difference between the 'Delcap Actual' and 'Delcap Budget' figures to determine the Renewal's Budget Variance, however the split of this variance has been determined by taking the same split of the variance that is seen between the 'Full Year Actual' and 'Full Year Budget'. Therefore the values assigned to the split of the variance reported in the Network Rail Annual Return are not the actual values of the variance split reported by the asset areas.
- 10.2.57 The renewal budget variances that have been reported by the asset teams and those reported by the Finance team are in some cases different for all asset areas as shown in NR Annual Return table 1.1.7

### Assessment of confidence grade

- 10.2.58 **Reliability grade.** The procedure for this measure is documented. However, there was evidence of the categorisation process is not being followed correctly. We believe the Renewals Budget Variance analysis should have a reliability grade of B.
- 10.2.59 **Accuracy grade.** There was some discrepancy in the figures reported into the Finance team by the asset areas and that reported in the Annual Return by the Finance team and therefore some estimation measures, as outlined above, were used to determine the attribution of the variance over the various categories. There were also differences in the Renewals Variance figures reported by the asset teams and those reported in the NR Annual Return as shown in table 1.1.7. We believe the Renewals Budget Variance analysis should have an accuracy grade of 3.

### Audit Statement

- 10.2.60 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2009 for Variance analysis of the Renewals budget. We believe the renewals unit cost data should have an accuracy band of B3.
- 10.2.61 So that our assessment of renewals efficiency can use both unit costs and variance of outturn against budget, Network Rail's performance in comparison with the regulatory target is reported separately below.

### Recommendations arising

#### *Recommendations essential for the accuracy and/or reliability of the measure*

- 10.2.62 **Renewals budget variance recommendation 1.** We recommend that there is consistency between the renewals budget variance figures reported by the asset teams and those reported by the Finance team.

#### *Observations relating to spreading of best practice and/or improvements to process*

- 10.2.63 We have no observation for this measure.

### Progress on outstanding recommendations from previous audit reports

- 10.2.64 There are no outstanding recommendations for this measure.

## 10.2E Comparison of results with regulatory targets

### Introduction

10.2.65 Due to the nature of the targets set in Access Charges 2003, Network Rail's renewals efficiency is assessed using a combination of unit cost indices (mostly with benchmarks more recent than 2003/04) and budget variance analysis. This section assesses Network Rail's performance against the regulatory targets for renewals efficiency.

### Regulatory target

10.2.66 The regulatory target for 2007/08 efficiency savings is 29.7% (cumulative over the first four years of the Control Period; 2004/05=8%pa, 2005/06=8%pa, 2006/07=8%pa, 2007/08=5%, 2008/09=5%).

10.2.67 Figure 10.2E.1 compares performance using the unit cost indices and the budget variance analysis. These have been subject to sample audit in subsections 10.2B, 10.2C & 10.2D above.

Asset	Cumulative Efficiency for CP3		Performance against target
	Budget Variance	Unit Cost	
Track	16	11.7	Not met
Signalling	28.5	37.4	Indeterminate
Structures	29.3 (30.4)	30.2	Indeterminate
Electrification, Plant & Machinery	18.9	n/a	Met
Telecoms	34.4	30.3	Met
Estates	30.7 (30.8)	n/a	Not met
<b>Total</b>	<b>24.0%</b>	<b>18.3%</b>	<b>Not met</b>

Figure 10.2E.1 Core renewals efficiency savings (03/04 baseline)

### Audit Statement

10.2.68 Using a combination of the unit cost and renewals budget variance data to assess Network Rail's performance, the regulatory target for renewals efficiency has not been met.

### Recommendations arising

*Recommendations essential for the accuracy and/or reliability of the measure*

10.2.69 We have no recommendations for this measure.

*Observations relating to spreading of best practice and/or improvements to process*

10.2.70 We have no observations for this measure.

### Progress on outstanding recommendations from previous audit reports

10.2.71 There are no outstanding recommendations for this measure.



## 10.3 Debt to RAB Ratio

### Audit scope

- 10.3.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2009, Section 7, Efficiency and Finance.
- 10.3.2 This measure reports Network Rail's net debt as a percentage of its regulatory asset base (RAB) which provides an indication of Network Rail's financing position.
- 10.3.3 The audit was undertaken at Network Rail Headquarters.

### Commentary on reported data

#### Regulatory targets

- 10.3.4 There is no regulatory target for these measures. However, Condition 29 of the Network Licence requires that:
- Network Rail does not to incur financial indebtedness in excess of 100% of the RAB; and
  - Network Rail must take all reasonable endeavours to keep its net debt as a percentage of its RAB below 85%.

#### Trend

- 10.3.5 As at 31 March 2009, the Regulatory Accounts show RAB as £29,841m and net debt as £20,890m. The variance between the target value and the actual Debt to RAB ratio for 2008/09 is not yet known as the data has not been received from Network Rail.

	2004/05	2005/06	2006/07	2007/08	2008/09	% Variance on 2008/09
Debt/RAB	76.5%	78.1%	73.5%	69.4%	70.0%	1.6%

Figure 10.3.1 Material Variance of Actuals and Business Plan Forecast for Renewals

- 10.3.6 The following commentary on the figures was provided by Network Rail. 'The net debt to RAB ratio at the end of Q4 is 2.5% higher than at the end of Q3, largely due to the downward adjustment to the RAB for deferrals of ACR2003 funded renewals and enhancements (£1,018m) (3.3%). This is offset by RAB additions for renewals and enhancements in the quarter of £913m. Debt rose by £470m in the quarter. Note: Other adjustments of £4,613m for issues such as the revenue deferral and incentive schemes'.
- 10.3.7 The Debt/RAB ratio reported in the 2009 Network Rail Annual Return is very close to the reported last year, the ratio however has decreased from 76.5% to 70% since 2004/05, with some minor fluctuations in between. A variation of 1.6% was seen between the actual and target Debt to RAB ratio.

### Audit Findings

#### Process

- 10.3.8 The ratio is calculated using data from the Regulatory Accounts. The net debt calculation in the Regulatory Accounts differs from that appearing in the Statutory Accounts, primarily due to IAS39 stipulating non-Sterling Bonds are valued at spot rate whereas the Regulatory Accounting Guidelines value non-Sterling Bonds at the hedged rate. This is further documented in Appendix D of the Regulatory Financial Statements for the year ended 31 March 2009.

*Data accuracy*

10.3.9 The calculation, using data from the Regulatory Financial Statements audited by the Regulatory Auditor, is correct.

**Assessment of confidence grade**

10.3.10 **Reliability grade.** The ratio is calculated using data from the Regulatory Financial Statements. We believe the Debt to RAB Ratio should have a reliability band of A.

10.3.11 **Accuracy grade.** The calculation, using data audited by the Regulatory Auditor, is correct. We believe the Debt to RAB Ratio should have an accuracy band of 1.

**Audit Statement**

10.3.12 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2009 for Debt to RAB Ratio. The data has been assessed as having a confidence grade of A1.

**Recommendations arising**

*Recommendations essential for the accuracy and/or reliability of the measure*

10.3.13 We have no recommendations for this measure.

*Observations relating to spreading of best practice and/or improvements to process*

10.3.14 We have no observation for this measure.

**Progress on outstanding recommendations from previous audit reports**

10.3.15 There are no outstanding recommendations for this measure.

## 10.4 RAB Volume Incentives

### Audit scope

- 10.4.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2009, including Table 7.12.
- 10.4.2 This measure reports the forecast levels of payment that will be received by Network Rail as an incentive to facilitate growth in passenger and freight volumes. The RAB Volume Incentives are calculated over the Control Period as a whole and are to be added to the RAB at the end of the Control Period.
- 10.4.3 Though the calculations are specified in Access Charges 2003, there are no formal definitions or procedures for the reporting of the RAB Volume Incentives in the Annual Return.
- 10.4.4 The audit was undertaken at Network Rail Headquarters.

### Commentary on reported data

#### *Regulatory targets*

- 10.4.5 There is no regulatory target for these measures.

#### *Trend*

- 10.4.6 The measure is a single value for the Control Period as a whole. The current value of RAB adjustment for Control Period 3 reported in the Annual Return and the Regulatory Accounts is £581.5m (2008/09 prices).
- 10.4.7 The RAB volume incentive achieved for freight was £0.00, therefore the figure of £581.5m is solely from passenger volume incentive. The increase in the passenger volume incentive was explained by Network Rail as mainly being due to the increase in frequency of services following the West Coast mainline project. This figure pertains to the whole of CP3.

### Audit Findings

#### *Process*

- 10.4.8 The calculations for the volume incentives are set out in ORR's Access Charges Review 2003 based on incentive rates and the growth in comparison with a baseline volume:
- For the passenger incentive, the baseline volume comprises actual passenger train miles and farebox revenue; only franchised passenger trains are included in the calculation, though the volume growth which Network Rail can most easily influence (arguably) comes from open access operators rather than franchised operators;
  - For the freight incentive, the baseline volume comprises actual freight train miles and freight gross tonne miles (GTM).
- 10.4.9 In respect of the data for the calculation:
- The actual passenger revenue data comes from ORR's National Rail Trends Yearbook 2008/09;
  - The passenger revenue data comes from Rail Industry Forecasting Framework (RIFF v1.2) using Passenger Demand Forecasting Handbook parameters (PDFH 4.1); the demand drivers projection is sourced from OEF, TEMPRO, WebTAG and National Transport Model;
  - The actual train mileage data comes from Network Rail's train performance database PALADIN;

- (d) The actual freight tonnage data comes from Network Rail's freight billings system (BIFS);
- (e) The train mileage and tonnage data comes from Network Rail's Business Plan (Polkadot model).
- (f) Actuals have been used for the final calculation for CP3.

#### *Data accuracy*

- 10.4.10 This year actual RPI (November) figures from ONS have been used to calculate the RAB volume incentive for the 2008/09 Network Rail Annual Return. It was noted in our 2007/08 report that the figure used to calculate the RAB volume incentive in the 2007/08 Return was undertaken earlier in 2008 where the forecasts for inflation were lower but has since been corrected. The spreadsheets used to calculate the RAB volume incentive and the adjustments made following the new approach have been reviewed and are accurate.

#### **Assessment of confidence grade**

- 10.4.11 **Reliability grade.** The data is from reliable sources. However, as reported in previous years, the baseline has been back-calculated following a change to two underlying datasets which needs to be further documented as it will directly change the 2008/09 result. We believe the RAB Volume Incentive should have a reliability grading of B.
- 10.4.12 **Accuracy grade.** This year actual RPI (November) figures from ONS have been used to calculate the RAB volume incentive for the 2008/09 NR Annual Return. The baseline has been subject to change and the underlying reason has not yet been fully explained. We believe the RAB Volume Incentive should have an accuracy grading of 3.

#### **Audit Statement**

- 10.4.13 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2009 for RAB Volume Incentive. The data has been assessed as having a confidence grade of B3.

#### **Recommendations arising**

##### *Recommendations essential for the accuracy and/or reliability of the measure*

- 10.4.14 We have no recommendations for this measure

##### *Observations relating to spreading of best practice and/or improvements to process*

- 10.4.15 We have no observation for this measure.

#### **Progress on outstanding recommendations from previous audit reports**

- 10.4.16 We set out below our assessment on the current progress of Network Rail in addressing our outstanding recommendations for RAB Volume Incentive from our previous Audits:

Recommendations made	Progress update
<p><b>2008 –R47.:</b> We recommend the specifications of the input data and subsequent calculations are recorded by Network Rail and agreed with ORR. The baselines for freight train mileage and tonnage have been subject to change since they were initially set, due to changes to the method of calculating/ reporting the two datasets; ORR will need to be clear as to the correctness of these changes as they directly affect the result of the RAB Volume Incentive.</p>	<p>NR have informed us that this is in progress.  <b>Current Status – In progress</b></p>
<p><b>2007-R46:</b> We recommend the specifications of the input data and subsequent calculations are recorded and agreed with ORR.</p>	<p>No further action required  <b>Current Status – Withdrawn</b></p>

Figure 10.4.1 Progress on our recommendations

## 10.5 Financial Efficiency Index (FEI)

### Audit scope

- 10.5.1 This audit was undertaken to assess the reliability and accuracy of the section on Operational Performance in Network Rail's Annual Return 2009, Section 7, Efficiency and Finance, including Table 7.11.

### FEI Calculation

#### 'Original' FEI Index

- 10.5.2 The Financial Efficiency Index (FEI) was introduced in 2003/04 as part of the overall efficiency monitoring of NR. The original formula (published in the Management Incentive Plan Statement 03/04) was as follows:

$$(O \times 0.779) + (M \times 0.933) + (R \times 1.015)$$

Where:

O = Total Controllable costs multiplied by a factor of 0.779. This indexation factor is the Opex element of the 2003 FEI divided by the 2003 Opex results.

M = Total Maintenance costs normalised for the number of equated track miles in the relevant year compared to the number of equated track miles as at February 2005 (M) multiplied by a factor of 0.933. This indexation factor is the Maintenance component of the 2003 FEI divided by the 2003 total maintenance costs.

R = Total Plain Line Track Renewals expenditure normalised for volumes activity delivered in the relevant year compared to the volume delivered in 2001, multiplied by a factor of 1.015. This indexation factor is the plain line renewals component of the 2003 FEI divided by the 2003 total plain line renewal costs.

All costs expressed in 2002-03 prices.

#### 'New' FEI Index

- 10.5.3 As an improvement in order to extend the breadth of the FEI measure, NR introduced in March 2007, a new formula was produced which included a larger range of unit costs. The measure was also converted to a percentage "index" by comparing the unit costs with baseline figures from 2003.

- 10.5.4 The new formula, published in March 2007, is as follows:

$$FEI_{yr} = (O_{yr} + (M \times (ETM_{base} / ETM_{yr}))) + (R1 \text{ unit cost } yr \times Vol_{yr}) + (R2 \text{ unit cost } yr \times Vol_{yr}) + (R3 \text{ unit cost } yr \times Vol_{yr}) / (O_{base} + M_{base} + (R1 \text{ unit cost } base \times Vol_{yr}) + (R2 \text{ unit cost } base \times Vol_{yr}) + (R3 \text{ unit cost } base \times Vol_{yr}))$$

Where:

O = Controllable Opex

M = Maintenance Costs

R1 = Plain Track Renewals

R2 = S&C renewals

R3 = Major Resignalling Renewals

- 10.5.5 The values of FEI since 2003 are shown in the table below.

	FEI							
	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
<b>Previous Index (Actuals)</b>	2,089	2,371	2,144	1,972	1,877			
<b>New Index (Actuals)</b>				85.1	82.2	78.1	75.3	73

Figure 100.5.2 Values for FEI since 2003

## Commentary

### *Change of index calculation in the middle of a control period*

- 10.5.6 The change to the FEI Index calculation makes historical comparison problematic for assessing CP3 efficiency:
- The figures for the last two years of the control period have not been reported for the original index;
  - Some retrospective figures for the new index were reported in the 2008 Annual Return but this did not include the first year of the control period.
- 10.5.7 The ORR have requested "year by year" data and thus require one or both of the FEI calculations to be undertaken for the whole of CP3. The IR would maccept NR's comments that the FEI is re-based against the beginning of CP3, thus the final performance can be assessed.

### *Management Incentive Plan Statements*

- 10.5.8 The new index was introduced in March 2007; however, the 2007/08 and 2008/09 Management Incentive Plan (MIP) statements show the formula for the original index with the target figure quoted for the new index.

### *Definition – indexation*

- 10.5.9 The current definition does not define how the "base" data (in 2003 prices) is to be inflated to be compared with the current year. The current process NR use a RPI index based in November 2008. Whilst RPI may be the main inflationary pressure on Opex Costs, we do not believe that RPI is a suitable inflationary factor in relation to Maintenance and Renewals. As the effect of the inflationary index used is significant, a more appropriate index may be appropriate.

### *Definition – ETM (1)*

- 10.5.10 The 2007 FEI definition document states:
- "The baseline for ETMs has been updated to February 2005 to eliminate efficiencies delivered in Control Period 2."
- 10.5.11 However, to eliminate efficiencies delivered in CP2 we would expect the ETM baseline to be the starting date of CP3, which is April 2004 not February 2005 as set out in the definition. NR has clarified that the Feb 2005 ETM figure was used as this represented the most reliable start point. NR also note that as the ETM has been gradually increasing, using the Feb 2005 figure may in fact result in understating the efficiency. The IR would point out that the ETM factor is based on track type, traffic tonnage band, tonnage type and speed and therefore may not have been lower in April 2004.
- 10.5.12 As a corollary, we note that in the P12 FEI spreadsheet issued by Network Rail to us, the reference table of baseline ETMs has a reference figure of 21,896 which is labelled as 2003/04 – either the labelling in the spreadsheet is not right or the data used in the spreadsheet is an estimate and is not for February 2005 as required by the definition.

*Definition – ETM (2)*

10.5.13 Whilst there may not be much variation in the ETM figure throughout the year, there is a Budget ETM figure and Actuals ETM figure which is updated at year end. It is not clear from the definition which is to be used. (see further discussion on ETMs in section 1.1.25)

*Commentary on changes to FEI Q3 to Q4*

10.5.14 Network Rail has submitted a commentary of the changes to FEI since the Q3 forecast – the Q4 actuals show an improvement of 1.4 against the Q3 forecast and an improvement of 2.3 against the P12 forecast – which leads to Network Rail achieving the budgeted target of 75.3. We note that FEI forecasts during the financial year can change significantly due to adjustments at year end.

10.5.15 We have the following comments to make regarding the updates and their effect on the FEI result.

(a) Controllable Opex (-0.5 change in FEI):

- (i) The effect of the “Thameslink Bonus - £6m” was due to an accounting change. Notwithstanding this, Thameslink is an enhancement project so we question why this saving is included in Controllable Opex;
- (ii) The other significant reduction in Opex was due to “un-required ring-fenced Edinburgh - Waverley Fee Fund -£5m”; again we question why this saving is included in Controllable Opex.

(b) Maintenance Costs (-0.2 change in FEI)

- (i) There has been a delay in concluding negotiations with the Trade Unions in regard to Maintenance Terms & Conditions. As such a £20m contingency was “saved” from the budget.

(c) S&C Unit Costs (-0.6 change in FEI):

- (i) We concur that release of £9m contingency is evidence of good risk management and should be included as efficiency leading to a change of -0.2 in the FEI;
- (ii) Network Rail’s commentary notes that renewals volumes delivered by the Maintenance teams were mistakenly omitted until Period 13 leading to a change of -0.2 in the FEI; this raises concerns regarding data accuracy and data assurance processes.
- (iii) Network Rail’s commentary suggests that the Maintenance teams delivered track renewals at “a very efficient rate” leading to a change of -0.2 in the FEI. As we note in the paragraphs below, there are concerns regarding data quality of costs and volumes in the Maintenance Delivery Units which suggests this number should be subject to particular scrutiny. In particular there have been issues with labour being allocated incorrectly to Maintenance rather than Renewals/ Capex which may not have been properly corrected.

(d) ETM Adjustment (-0.1 change in FEI) – this adjustment reflects the “budget” and “actual” ETM figure tracked throughout the financial year. The “actual” figure should reflect changes in tonnage etc.

10.5.16 We have no further explanation from NR regarding these adjustments to FEI. There seems to be some anomalies with regard to accounting practices which affect the calculation of the FEI. The IR would recommend that clear guidelines are issued with regard to what should be included in “Controllable Opex” specifically costs or savings related to Enhancement projects should not be included.

*Commentary on Adjustment to FEI by Remco 2009 in Annual Accounts*

- 10.5.17 An amount of £20m contained within the 2008/09 budget relating to the cost of standardisation of terms and conditions of employment within the Infrastructure Maintenance function was not utilised since negotiations with the trade unions on this have not yet concluded. In relation to the Edinburgh Waverley project Network Rail earned a contractual bonus for early completion of the project supplementing the FEI by £5m. The Remuneration Committee considered that both items should be excluded from the calculation of FEI performance for the purpose of the MIP awards as theoretically neither represented financial efficiency of the type relevant for the MIP awards. The level of achievement of this measure was halved by these exclusions.
- 10.5.18 This adjustment by the REMCO would confirm that the FEI calculation should only relate to improvements that truly reflect the intention of the FEI calculation.

**FEI as an indicator of efficiency**

- 10.5.19 Network Rail's maintenance efficiency is assessed using budget variance analysis, which represents the difference between budgets and actual expenditure within each year. The regulatory target for 2007/08 efficiency savings is 30% (cumulative over the first four years of the Control Period; 2004/05=8%pa, 2005/06=8%pa, 2006/07=8%pa, 2007/08=5%, 2008/09=5%).

Year	Indices		Cumulative Efficiency		
	Original Index (2003 prices; source: Network Rail)	New Index (source: Annual Return 2008)	Original Index Cumulative % Efficiency	New Index Cumulative % Efficiency	Regulatory Target
2003/04	2,371	n/a	n/a	n/a	
2004/05	2,144	n/a	10%	n/a	8.0%
2005/06	1,972	85.1	17%	n/a	15.4%
2006/07	1,877	82.2	21%	3%	22.1%
2007/08	n/a	78.1	n/a	8%	26.0%
2008/09	n/a	75.3	n/a	12%	30.0%

**Figure 10.5.3 Values for FEI since 2003**

- 10.5.20 As noted in paragraph 10.5.67 above, neither index extends for the full extent of CP3, which makes its use as a measure of CP3 efficiency problematic. However, by eye, a combination of the original and new indices appears to track the regulatory target.
- 10.5.21 The Independent Reporter also notes that the Annual Report and Accounts 2009 confirms that the FEI calculation only covers 61% of the total operating, maintenance and renewals expenditure therefore whilst an improvement of the original Index, it is not wholly representative of all expenditure.

**Controllable Opex**

- 10.5.22 Network Rail's proposal to monitor aggregate controllable opex is consistent with the derivation of the ACR2003 efficiency assumptions provided that a robust cost allocation process is put in place to ensure that opex is identified consistently to ACR2003.

- 10.5.23 In addition to our comments above regarding adjustments to the FEI index in last quarter 2009, we note that the Remuneration Committee (Network Rail 2009 Annual Accounts) chose to ignore “savings” accrued from Enhancement Projects (ref Waverley Project). There were other “savings” made to the 2009 FEI accrued from the Thameslink project, when this was transferred to a different P&L account. These changes indicate that the cost allocation exercise used to create the Opex account may not as robust and is not identified consistently to ACR2003.

### Equated Track Miles – Pro’s and Con’s

- 10.5.24 The concept of equated track miles was developed by British Rail Research and reflects the expected level of maintenance activity associated with track type, traffic tonnage band, tonnage type and speed. Different factors are applied to sections of track depending on the track configuration type (ballast depth, sleeper type, rail type; continuously welded, jointed, switches and crossings), speed and tonnage band.
- 10.5.25 The underlying premise of the ETM measure is that it reflects an expected level of maintenance activity at an aggregate level for a particular combination of track types, principally driven by expected track degradation (i.e. reactive maintenance) and recommended maintenance schedules (i.e. inspection and preventative maintenance). There is also an implicit assumption that work is carried out in accordance with required quality standards, i.e. the network is maintained in a steady state condition with no change to infrastructure condition or quality of operating outputs. It is not in itself a measure of actual activity undertaken.
- 10.5.26 The ETM factors were originally derived from the MARPAS project in 1990 with relative maintenance inputs determined by consideration of standard task durations, expected task inputs for each type
- 10.5.27 In Halcrow’s 2006 report *Audit of Network Rail’s Roll-out of Cost Analysis Frameworks and Maintenance Unit Cost Measures* as the results of our audits we have concerns about the accuracy of the ETM calculation using data from GEOGIS and NETRAFF. While it is not possible to quantify the extent of the possible error as part of this project we note that Network Rail has also commented that the calculation of ETMs is not necessarily very robust. The ETM value has been used since to adjust maintenance costs (see next section).
- 10.5.28 While the quality of the data is being addressed by Network Rail in the longer-term, the important issue in the short-term is the extent to which Network Rail’s systems will accurately reflect changes in the ETM figure. As the ETM figure is being used as an input into a unit cost calculation it is changes in this figure, rather than the absolute level which is most important.
- 10.5.29 Of particular importance in this area is:
- (a) how quickly GEOGIS is updated to reflect changes in the asset population and the network’s operating characteristics; and
  - (b) how accurately changes in traffic volumes are reflected. This is a particular issue for freight as, while passenger movements can be accurately determined from the timetable, only around 50% of timetabled freight trains operate. It is important, therefore, that the freight traffic data contained in NETRAFF and used in the ETM calculation is based on actual freight movements.
  - (c) Any inherent inaccuracy of the ETM value will reflect on the accuracy of the FEI index.

## 11 Reporter's scrutiny and opinion

### Commentary on Annual Return 2009

- 11.1.1 This is Halcrow's final year as Independent Reporter for the Audit of Network Rail's Annual Return. I can report that, by and large, we experienced satisfactory co-operation at all levels within Network Rail which has allowed our audit report to be delivered to schedule. Confirmatory and/or supporting data from Network Rail, requested by our audit teams as an essential element of our audit work, has been made available to us. Unfortunately, in a number of cases it has been received very late in our reporting timescale agreed with Network Rail and ORR, and evidently unchecked for accuracy by Network Rail on issue. This represents a marked deterioration in the timeliness and quality of data provision by Network Rail from what has, for some seven years now, been a largely non-contentious and timely process. It is not for the Independent Reporter, however, to speculate on the reasons behind this deterioration.
- 11.1.2 We believe that Network Rail's Annual Return should be regarded as a consolidated report on their delivery of regulatory measures and specific targets. Taken in this context the Annual Return satisfies that objective. The suite of measures and targets, as presently defined, forms a partial view of Network Rail's activities, but does not provide a detailed view on every aspect of Network Rail's performance and stewardship, particularly where measures are not aligned with Network Rail's management information or priorities. A detailed review, analysis and comment on each of the individual measures which we have audited can be found within the main body of our report.
- 11.1.3 The figures contained in the Annual Return 2009 indicate that Network Rail has achieved the required regulatory targets with the exception of the following Measures:
- (e) Earthworks Failures (Measure M6);
  - (f) Electrification condition – d.c. traction contact system (Measure M16);
  - (g) Renewals Efficiency: Unit Costs; and
  - (h) Renewals Efficiency: Budget Variance
- 11.1.4 This year's exceptions are identical to last year's and our auditors' commentary outlining the circumstances leading to these exceptions is provided in the relevant sections of our audit report.
- 11.1.5 As in previous years, in assessing whether or not Network Rail has achieved the targets set, we have not taken into consideration tolerance levels, nor have we taken into account the confidence grades which have been self-assigned by Network Rail to the measures.

### Data Quality Issues

- 11.1.6 We have found little general improvement this year in the quality and accuracy of the data provided by Network Rail for the purposes of our audits or presented in their Annual Return. Unfortunately, as referred to above, some areas of notable deterioration in Network Rail's data quality and accuracy have arisen.

- 11.1.7 It is the Independent Reporter's considered view that, in relation to the confidence grading achieved by Network Rail for its reported data, a Reliability Grade of anything other than A or B is inadequate and is reflective of deficient data management or reporting processes, and an Accuracy Grade of anything other than 1 or 2 is inadequate and is reflective of inadequate rigour in data collection and validation. Examination of our Confidence Grade summary table (Appendix F) demonstrates that Network Rail still has some way to go to achieve what is a not unreasonable objective.
- 11.1.8 We have made a number of recommendations to address these process and data quality deficiencies and our successors as Independent Reporter will no doubt be subsequently following these up with Network Rail on behalf of ORR. In five instances we have sufficient concerns to have downgraded the confidence level of the reported measure from that in our 2008 Audit Report:
- (f) Electrification condition – a.c. traction feeder stations & track sectioning points (Measure M13);
  - (g) Electrification condition – d.c. substations (Measure M14);
  - (h) Electrification condition – a.c. traction contact system (Measure M15);
  - (i) Station Condition Index (Measure M17); and
  - (j) Signalling Renewed (Measure M24)

#### Nature of Regulatory & Other Targets

- 11.1.9 As Independent Reporter for Audit of Network Rail's Annual Return we have no specific remit from ORR to examine Network Rail's asset management practices as such; the purpose of this report being to independently validate the data collected and analysed by Network Rail's for their Annual Return to demonstrate compliance (or otherwise) with their relevant regulatory and other stakeholder-agreed targets.
- 11.1.10 In undertaking our audit programme it is evident that there is an investment by Network Rail in staff resource and time in the collection, collation and analysis of asset condition and asset performance data specifically for ORR monitoring and Annual Return purposes. What still has not been made clear to us is the extent to which that data is of practical value to the relevant Network Rail managers in their day-to-day management of the infrastructure assets concerned, or whether parallel data collection and analysis work-streams have had to be established to that end.
- 11.1.11 It is our firm belief that the adoption of a more systematic approach by Network Rail to go beyond the simple collection, collation and analysis of asset condition and asset performance data, to extend to positively ensuring compliance with (or bettering) the agreed regulatory and specific targets as set; would have the benefit of improving Network Rail's performance and asset stewardship overall. On that basis alone a more thorough approach on their part would be worthwhile. Failing that, we believe that it would be necessary for ORR to introduce a more rigorous regime of monitoring compliance with these measures throughout the year, requiring corrective action plans from Network Rail from time to time where compliance is patently not being achieved.

#### Reporter's Audit Statement

- 11.1.12 This report, including opinions, has been prepared for use of Office of Rail Regulation and Network Rail and for no other purpose. We do not, in reporting, accept responsibility for any other purpose or to any other person to whom this report is shown. We report our opinion as to whether Network Rail's Annual Return 2009 gives a representative view and whether the data reported by Network Rail is consistent with evidence provided to us at audit.
- 11.1.13 We confirm that Network Rail has prepared the Annual Return for 2009 in accordance with its regulatory and statutory obligations using procedures prepared by Network Rail and agreed with Office of Rail Regulation.

- 11.1.14 We confirm that Network Rail's Annual Return 2009 was submitted in accordance within the timescale required by Condition 15 of Network Rail's Network Licence.
- 11.1.15 We confirm we have completed audits of the data contained in Network Rail's Annual Return 2009 relating to the measures contained in the "Form of the 2009 Annual Return" prepared by Network Rail and agreed with the Office of Rail Regulation in accordance with the requirements of Paragraph 8 of Condition 15 of the Network Licence. The only exceptions are where we have identified in the text of our report matters which require further clarification. We conducted our audit in accordance with an audit plan. Our audit included examination, on a sample basis, of evidence relevant to the data and disclosures in the Annual Return 2009. We planned and performed our audit so as to obtain information and explanations which we considered necessary in order to provide us with sufficient evidence to give reasonable assurance on the validity of data in the Annual Return 2009.
- 11.1.16 We confirm that, in our opinion, the reported information is an acceptable representation of performance, and that data has been sufficiently well prepared and reported in accordance with agreed procedures, except as specifically identified in our audit report commentaries.

David Simmons,  
Independent Reporter,  
Halcrow Group Limited,  
August 2009



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## 13 Appendix B: Glossary of Acronyms

Acronym	Meaning
a.c.	alternating current
ABC	Automatic Ballast Cleaners
ACR2003	Access Charges Review 2003
ADPT	Area Delivery Planning Team
ADRC	Access Dispute Resolution Committee
AMCL	Asset Management Consulting Limited [Independent Reporter for Asset Management]
APSSS	Acting Possession Systems Support Specialist
ARM	Asset Reporting Manual
ARME	Area Rail Management Engineer
ASII	Asset Stewardship Incentive Index
ATOC	Association of Train Operation Companies
BIFS	Billing Infrastructure Freight System
CAF	Cost Analysis Framework
CARRS	Civils Asset Register and electronic Reporting System
CDDS	Condition Data Distribution System
CDMS	Condition Data Management System
CEO	Chief Executive Officer
CET	Controlled Emission Toilet
CIA	Central Asset Inventory
CP	Control Period
CP2	Control Period 2 [1 April 2009 to 31 March 2004 (1999/2000 - 2003/04)]
CP3	Control Period 3 [1 April 2004 to 31 March 2009 (2004/05 - 2008/09)]
CP4	Control Period 4 [1 April 2009 to 31 March 2014 (2009/10 - 2013/14)]
CP5	Control Period 5 [1 April 2014 to 31 March 2019 (2014/15 - 2018/19)]
d.c.	direct current
DAG	Delay Attribution Guide
DEFRA	Dept for Environment, Food & Rural Affairs
Dft	Department for Transport
E&P	Electrification & Power
ECAP	Electrification Condition Assessment Process
ECML	East Coast Main Line
ELR	Engineering Line Reference
ERTMS	European Rail Traffic Management System
ESR	Emergency Speed Restriction
ETM	Equated Track Miles
FMS	Fault Management System
FOC	Freight Operating Company
FS	Feeder Stations
GEOGIS	Geography & Infrastructure System
GRIP	Guide to Railway Investment Projects
GTM	Gross Tonne Miles
HLOS	High Level Output Statement
HPSS	High Performance Switch System
HQ	Headquarters

<b>Acronym</b>	<b>Meaning</b>
HRMS	Human Resource Management System
HS1	High Speed 1
ICC	Integrated Control Centre
IDC	Interlocking Data Cards
IFC	Infrastructure Fault Control
IM	Information Management
IMC	Infrastructure Maintenance Company
IRIS	Integrated Railway Information System
IT	Information Technology
IWA	Individual Working Alone
JPIP	Joint Performance Improvement Plan
JPP	Joint Performance Process
KPI	Key Performance Indicator
kV	kilovolts
L&SE	London & South East
L2	Level 2
LDP	Late Disruptive Possession
LED	Light Emitting Diode
LMD	Light Maintenance Depot
LNE	London North Eastern [Territory]
LNW	London North Western [Territory]
LUL	London Underground Ltd
MBR	Management Business Review
MD	Midlands [Region]
MNT Code	Maintenance Code in Ellipse
MP&I	Major Projects & Investments
MUC	Maintenance Unit Costs
NDS	National Delivery Service
NERT	National Rail Reporting Team
NMT	New Measurement Train
NR	Network Rail
NRDF	Network Rail Discretionary Fund
NRM	Network Rail Monitor
NST	Network Specialist Team
NW	North West [Region]
OFWAT	The Water Services Regulation Authority
OHL	Over Head Line
OHLE	Over Head Line Electrification
OLE	Overhead Line Electrification
OP	Oracle Project
ORR	The Office of Rail Regulation
P3e	Primavera Project Planner Enterprise version
PALADIN	Performance & Loading Database
PCS	Project Control System
PL	Plain Line
PMR	Performance Management Reporting
PMRS	Performance Management Reporting Systems

<b>Acronym</b>	<b>Meaning</b>
PON	Periodic Operating Notice
PPM	Public Performance Measure
PPS	Possession Planning System
pSICA	Primary Signalling Infrastructure Condition Assessment
PSS	Performance Systems Strategy
PTG	Poor Track Geometry
RA	Route Availability
RAB	Regulatory Asset Base
RCF	Rolling Contact Fatigue
RDMS	Rail Defect Management System
RDT	Rail Defect Tracker
RIA	Rail Industry Association
RPA	Regional Planning Assessment
RRV	Road-Rail Vehicles
RSHi	Rock Slope Hazard Index
RSPS	Route Safety Performance Specialist
RSSB	Rail Safety and Standards Board
RUS	Route Utilisation Strategies
RWI	Repeatable Work Items
S&C	Switches and Crossings
SBMT	Structures Benchmarking Management Tool
SCI	Station Condition Index
SCMI	Structures Condition Marking Index
SCO	Scotland [Territory]
SD	Standard Deviation
SEA	South East [Territory]
SEC	Structures Examination Contractors
SEU	Signalling Equivalent Unit
SICA	Signalling Infrastructure Condition Assessment
SIS	SICA Information System
SMIS	Safety Management Information System
SMT	Southern Measurement Train
SPAD	Signal Passed At Danger
SSHI	Soil Slope Hazard Index
SSM	Station Stewardship Measure
STP	Short Term Planning
SUG	SICA User's Group
TABS	Track Access Billing System
TDA	Territory Delay Attributor
TL	Tension Length
TOC	Train Operating Company
TOPS	Total Operations Processing System
TGR	Track Geometry Reports
TQMF	Track Quality Main Frame
TRUST	Train Running System
TSM	Track Section Manager
TSP	Track Sectioning Points
TSR	Temporary Speed Restriction

<b>Acronym</b>	<b>Meaning</b>
UTU	Ultrasonic Test Unit
WCML	West Coast Main Line
WCRM	West Coast Route Modernisation
WES	Western [Territory]
WON	Weekly Operating Notice



## 14 Appendix C: Audit meeting schedule

Date	Venue	Audit	For Network Rail (or Other)	For Reporter A
18/02/09	King's Place	Safety & Environment	<ul style="list-style-type: none"> <li>Rod Reid</li> </ul>	<ul style="list-style-type: none"> <li>Graeme Pollard</li> </ul>
20/02/09	40 Melton Street	M3 & M5	<ul style="list-style-type: none"> <li>John Turner, Ian Barber (by telephone)</li> </ul>	<ul style="list-style-type: none"> <li>Phil Edwards, Nicola Nortcliffe</li> </ul>
23/02/09	40 Melton Street	M1 & M2	<ul style="list-style-type: none"> <li>Brian Witney, Mary Jordan</li> </ul>	<ul style="list-style-type: none"> <li>Phil Edwards, Nicola Nortcliffe</li> </ul>
24/02/09	40 Melton Street	M11, M12, M13, M14, M15, M16	<ul style="list-style-type: none"> <li>Richard Stainton, Charles Hervy, Mick Harlow, Glen Wiles</li> </ul>	<ul style="list-style-type: none"> <li>Asha Patel, James Webb, Rob Williams</li> </ul>
24/02/09	40 Melton Street	M9	<ul style="list-style-type: none"> <li>Ian Griffiths</li> </ul>	<ul style="list-style-type: none"> <li>Asha Patel, Mark Atkinson</li> </ul>
24/02/09	40 Melton Street	M6	<ul style="list-style-type: none"> <li>Eifion Evans</li> </ul>	<ul style="list-style-type: none"> <li>Mike Adkin, Nicola Nortcliffe</li> </ul>
25/02/09	King's Place	Safety	<ul style="list-style-type: none"> <li>Sally Tedder</li> </ul>	<ul style="list-style-type: none"> <li>Graeme Pollard</li> </ul>
25/02/09	40 Melton Street	M17 and M19	<ul style="list-style-type: none"> <li>Mike Rose, Tim Stringer</li> </ul>	<ul style="list-style-type: none"> <li>Asha Patel, Mike Adkin, Steve Beaumont</li> </ul>
26/02/09	Kings Place	Customer & Supplier Satisfaction	<ul style="list-style-type: none"> <li>Barbara Barnes, Pete Allen</li> </ul>	<ul style="list-style-type: none"> <li>Stewart Brown, Graeme Pollard</li> </ul>
26/02/09	40 Melton Street	MUC, Main/ce Expenditure	<ul style="list-style-type: none"> <li>Chris Davis, Andy Whitacker</li> </ul>	<ul style="list-style-type: none"> <li>Ian Miller</li> </ul>
27/02/09	1 Eversholt Street	M20-M22, M25	<ul style="list-style-type: none"> <li>Pete Ryan</li> </ul>	<ul style="list-style-type: none"> <li>Vidhi Mohan, Phil Edwards</li> </ul>
27/02/09	1 Eversholt Street	Freight Mileage	<ul style="list-style-type: none"> <li>Alan Porter</li> </ul>	<ul style="list-style-type: none"> <li>Vidhi Mohan, Christian Mills</li> </ul>
27/02/09	40 Melton Street	Passenger Mileage	<ul style="list-style-type: none"> <li>Rene Tym</li> </ul>	<ul style="list-style-type: none"> <li>Vidhi Mohan, Christian Mills</li> </ul>
04/03/09	Leeds	M4 LDP	<ul style="list-style-type: none"> <li>Chris Myers</li> </ul>	<ul style="list-style-type: none"> <li>Stewart Brown, Graeme Pollard</li> </ul>
06/03/09	125 House, Swindon	M23, M26-M29	<ul style="list-style-type: none"> <li>Andy Lundberg, Robert Oswald</li> </ul>	<ul style="list-style-type: none"> <li>Vidhi Mohan, Mike Adkin</li> </ul>
06/03/09	40 Melton Street	C4, ASII	<ul style="list-style-type: none"> <li>Mary Jordan &amp; team</li> </ul>	<ul style="list-style-type: none"> <li>Vidhi Mohan</li> </ul>
09/03/09	40 Melton Street	M24	<ul style="list-style-type: none"> <li>Richard Henstock, Andy Smith</li> </ul>	<ul style="list-style-type: none"> <li>Vidhi Mohan, Mark Atkinson</li> </ul>
10/03/09	40 Melton Street	Environment	<ul style="list-style-type: none"> <li>Kent Farrell, Diane Booth</li> </ul>	<ul style="list-style-type: none"> <li>Graeme Pollard</li> </ul>
10/03/09	40 Melton Street	M10	<ul style="list-style-type: none"> <li>Andy Smith</li> </ul>	<ul style="list-style-type: none"> <li>Vidhi Mohan, Mark Atkinson</li> </ul>
11/03/09	Buchanan House	Safety	<ul style="list-style-type: none"> <li>Wendy McFarlane</li> </ul>	<ul style="list-style-type: none"> <li>Graeme Pollard, Amy Fryday</li> </ul>
11/03/09	Kings Place	Volume Adjustments to RAB	<ul style="list-style-type: none"> <li>Anna Chan</li> </ul>	<ul style="list-style-type: none"> <li>Ian Miller</li> </ul>
11/03/09	Kings Place	Debt to RAB	<ul style="list-style-type: none"> <li>Ian Ramshaw</li> </ul>	<ul style="list-style-type: none"> <li>Ian Miller</li> </ul>
12/03/09	40 Melton Street	JPP	<ul style="list-style-type: none"> <li>John Thompson</li> </ul>	<ul style="list-style-type: none"> <li>Stewart Brown, Graeme Pollard</li> </ul>
16/03/09	40 Melton Street	Renewals Track	<ul style="list-style-type: none"> <li>Richard Henstock</li> </ul>	<ul style="list-style-type: none"> <li>Ian Miller</li> </ul>
18/03/09	40 Melton Street	Safety	<ul style="list-style-type: none"> <li>Mary Jordan</li> </ul>	<ul style="list-style-type: none"> <li>Graeme Pollard</li> </ul>
19/03/09	Eversholt St	Renewals S&T	<ul style="list-style-type: none"> <li>Peter Ryan</li> </ul>	<ul style="list-style-type: none"> <li>Ian Miller</li> </ul>

Date	Venue	Audit	For Network Rail (or Other)	For Reporter A
19/03/09	Kings Place	Expenditure Variance OPEX efficiency Overall Cost Control	<ul style="list-style-type: none"> <li>David Cooke</li> </ul>	<ul style="list-style-type: none"> <li>Ian Miller</li> </ul>
20/03/09	40 Melton Street	M13 and M14	<ul style="list-style-type: none"> <li>David McQuillen</li> </ul>	<ul style="list-style-type: none"> <li>Asha Patel, James Webb, Rob Williams</li> </ul>
23/03/09	York	M17	<ul style="list-style-type: none"> <li>Mark Norman, Stephen Fletcher</li> </ul>	<ul style="list-style-type: none"> <li>Asha Patel, Mike Adkin</li> </ul>
24/03/09	Milford House	Safety	<ul style="list-style-type: none"> <li>Paul Fergusson</li> </ul>	<ul style="list-style-type: none"> <li>Graeme Pollard, Amy Fryday</li> </ul>
26/03/09	40 Melton Street	C1, C2, C3	<ul style="list-style-type: none"> <li>Mary Jordan &amp; team</li> </ul>	<ul style="list-style-type: none"> <li>Vidhi Mohan</li> </ul>
03/04/09	Waterloo	M16	<ul style="list-style-type: none"> <li>Mark Proctor</li> </ul>	<ul style="list-style-type: none"> <li>Asha Patel, James Webb</li> </ul>
06/04/09	Croydon, Carolyn House	Safety	<ul style="list-style-type: none"> <li>Terry Mc Devitt</li> </ul>	<ul style="list-style-type: none"> <li>Graeme Pollard, Amy Fryday</li> </ul>
08/04/09	1 Eversholt Street	Freight Mileage	<ul style="list-style-type: none"> <li>Alan Porter</li> </ul>	<ul style="list-style-type: none"> <li>Christian Mills</li> </ul>
15/04/09	Croydon	M11 and M12	<ul style="list-style-type: none"> <li>Malcolm Arnold</li> </ul>	<ul style="list-style-type: none"> <li>Asha Patel, James Webb</li> </ul>
15/04/09	Woking	M11 and M12	<ul style="list-style-type: none"> <li>Ian Mortimer</li> </ul>	<ul style="list-style-type: none"> <li>Asha Patel, James Webb</li> </ul>
16/04/09	Birmingham - the mailbox	M11 and M12	<ul style="list-style-type: none"> <li>Tim Flower</li> </ul>	<ul style="list-style-type: none"> <li>Asha Patel, James Webb, Rob Williams</li> </ul>
17/04/09	York	M11and M12	<ul style="list-style-type: none"> <li>Geoffrey Norris, Martin Sayles</li> </ul>	<ul style="list-style-type: none"> <li>Asha Patel, Rob Williams</li> </ul>
20/04/09	40 Melton Street	M13 and M14	<ul style="list-style-type: none"> <li>David McQuillen</li> </ul>	<ul style="list-style-type: none"> <li>Asha Patel, Rob Williams, James Webb</li> </ul>
21/04/09	Edinburgh	M09	<ul style="list-style-type: none"> <li>Alex Sharkey</li> </ul>	<ul style="list-style-type: none"> <li>Asha Patel, Mark Atkinson</li> </ul>
21/04/09	Cardiff Canton	M19	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li>Stephen Beaumont</li> </ul>
21/04/09	Paisley	Safety	<ul style="list-style-type: none"> <li>Mike Bennett</li> </ul>	<ul style="list-style-type: none"> <li>Graeme Pollard</li> </ul>
22/04/09	Glasgow - Bucannon House	M11 and M12	<ul style="list-style-type: none"> <li>Lawrence Thompson</li> </ul>	<ul style="list-style-type: none"> <li>Asha Patel, Rob Williams</li> </ul>
22/04/09	Leeds Neville	M19	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li>Stephen Beaumont</li> </ul>
22/04/09	Milton Keynes/ Northampton	M1 & M2	<ul style="list-style-type: none"> <li>Jay Benson</li> </ul>	<ul style="list-style-type: none"> <li>Phil Edwards, Nicola Nortcliffe</li> </ul>
22/04/09	Rosebery House, Haymarker	Safety	<ul style="list-style-type: none"> <li>Alison Bodie</li> </ul>	<ul style="list-style-type: none"> <li>Graeme Pollard</li> </ul>
23/04/09	Romford	MUCs	<ul style="list-style-type: none"> <li>Tom McNamee</li> </ul>	<ul style="list-style-type: none"> <li>Ian Miller</li> </ul>
23/04/09	Glasgow - Bucannon House	M1 & M2	<ul style="list-style-type: none"> <li>Michele Mullen, Fay Stewart</li> </ul>	<ul style="list-style-type: none"> <li>Phil Edwards, Nicola Nortcliffe</li> </ul>
23/04/09	York	M15	<ul style="list-style-type: none"> <li>Robert Wilkins</li> </ul>	<ul style="list-style-type: none"> <li>Asha Patel, Rob Williams</li> </ul>
24/04/09	Glasgow Yoker	M19	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li>Stephen Beaumont</li> </ul>
24/04/09	London Bridge	MUCs	<ul style="list-style-type: none"> <li>Colin Rye</li> </ul>	<ul style="list-style-type: none"> <li>Ian Miller</li> </ul>
24/04/09	York	M1 & M2	<ul style="list-style-type: none"> <li>John Ellis</li> </ul>	<ul style="list-style-type: none"> <li>Phil Edwards, Nicola Nortcliffe</li> </ul>
27/04/09	Croydon	MUCs	<ul style="list-style-type: none"> <li>Scott Kenedy</li> </ul>	<ul style="list-style-type: none"> <li>Ian Miller</li> </ul>
27/04/09	Bristol	M1 & M2	<ul style="list-style-type: none"> <li>Steve Pearson, John James, Tony Scriven</li> </ul>	<ul style="list-style-type: none"> <li>Phil Edwards, Nicola Nortcliffe</li> </ul>
28/04/09	Colchester	M1 & M2	<ul style="list-style-type: none"> <li>Bob Hardwell, Nigel Wilson</li> </ul>	<ul style="list-style-type: none"> <li>Phil Edwards, Nicola Nortcliffe</li> </ul>
29/04/09	London Bridge	M09	<ul style="list-style-type: none"> <li>Gary Murphy, Stephen Carey</li> </ul>	<ul style="list-style-type: none"> <li>Asha Patel, Mark Atkinson</li> </ul>
06/05/09	Hudson House, York	C1	<ul style="list-style-type: none"> <li>Janine Beel, Ed Hart</li> </ul>	<ul style="list-style-type: none"> <li>Christian Mills</li> </ul>
08/05/09	Waterloo	M10	<ul style="list-style-type: none"> <li>Kevin Leach</li> </ul>	<ul style="list-style-type: none"> <li>Mark Atkinson</li> </ul>
12/05/09	Waterloo	C4	<ul style="list-style-type: none"> <li>Ian Rush</li> </ul>	<ul style="list-style-type: none"> <li>Christian Mills</li> </ul>

Date	Venue	Audit	For Network Rail (or Other)	For Reporter A
13/05/09	WSP House, London	M17	<ul style="list-style-type: none"> <li>Ian McDowell (NR External auditor)</li> </ul>	<ul style="list-style-type: none"> <li>Asha Patel, Cliff Buckton</li> </ul>
18/05/09	Trent House, Derby	M3 & M5	<ul style="list-style-type: none"> <li>Gavin Panter</li> </ul>	<ul style="list-style-type: none"> <li>Phil Edwards, Nicola Nortcliffe</li> </ul>
20/05/09	40 Melton Street	Renewals unit cost and variance - track	<ul style="list-style-type: none"> <li>Mark Hadley</li> </ul>	<ul style="list-style-type: none"> <li>Asha Patel</li> </ul>
27/05/09	George Stevenson House, York	M10	<ul style="list-style-type: none"> <li>Peter Bowers</li> </ul>	<ul style="list-style-type: none"> <li>Mark Atkinson</li> </ul>
27/05/09	40 Melton Street	Environment	<ul style="list-style-type: none"> <li>Annamarie Compton</li> </ul>	<ul style="list-style-type: none"> <li>Amy Fryday</li> </ul>
27/05/09	125 House Swindon	M23, M26-29	<ul style="list-style-type: none"> <li>Robert Oswald</li> </ul>	<ul style="list-style-type: none"> <li>Vidhi Mohan</li> </ul>
29/05/09	London Bridge	M09	<ul style="list-style-type: none"> <li>Gary Murphy</li> </ul>	<ul style="list-style-type: none"> <li>Mark Atkinson</li> </ul>
29/05/09	125 House Swindon	Renewals unit cost and variance - Structures and Estates	<ul style="list-style-type: none"> <li>Emma Noakes, Robert Oswald</li> </ul>	<ul style="list-style-type: none"> <li>Asha Patel</li> </ul>
04/06/09	40 Melton Street	C1, C2, C3 & C4	<ul style="list-style-type: none"> <li>Tony Smith</li> </ul>	<ul style="list-style-type: none"> <li>Christian Mills</li> </ul>
05/06/09	George Stevenson House, York	M6	<ul style="list-style-type: none"> <li>David Anderson, Jasper Gammon</li> </ul>	<ul style="list-style-type: none"> <li>Nicola Nortcliffe, Cliff Buckton</li> </ul>
06/06/09	Waterloo	M6	<ul style="list-style-type: none"> <li>Derek Butcher, Stephanie Anderson</li> </ul>	<ul style="list-style-type: none"> <li>Nicola Nortcliffe, Cliff Buckton</li> </ul>
08/06/09	Kings Place	RAB Volume Incentives	<ul style="list-style-type: none"> <li>Ana Chan</li> </ul>	<ul style="list-style-type: none"> <li>Asha Patel</li> </ul>
08/06/09	Woking MDU	M20-22, M25	<ul style="list-style-type: none"> <li>Sam McCarthy</li> <li>Sid Baldwin</li> </ul>	<ul style="list-style-type: none"> <li>Phil Edwards</li> </ul>
09/06/09	125 House, Swindon	M8	<ul style="list-style-type: none"> <li>Mike Smith, Kevin Giles</li> </ul>	<ul style="list-style-type: none"> <li>Nicola Nortcliffe</li> </ul>
10/06/09	40 Melton Street	C1, C2, C3 & C4	<ul style="list-style-type: none"> <li>Tony Smith</li> </ul>	<ul style="list-style-type: none"> <li>Christian Mills</li> </ul>
18/06/09	125 House, Swindon	M6	<ul style="list-style-type: none"> <li>Peter Muir, Kevin Giles</li> </ul>	<ul style="list-style-type: none"> <li>Nicola Nortcliffe, Cliff Buckton</li> </ul>
19/06/09	George Stevenson House, York	M8	<ul style="list-style-type: none"> <li>Richard Frost</li> </ul>	<ul style="list-style-type: none"> <li>Nicola Nortcliffe</li> </ul>
29/06/09	125 House Swindon	M23, M26-29	<ul style="list-style-type: none"> <li>Jonathan Bidy</li> <li>Dave Gilbert</li> </ul>	<ul style="list-style-type: none"> <li>Cliff Buckton</li> </ul>
02/07/09	Waterloo	M8	<ul style="list-style-type: none"> <li>Sharon Lee Nigel Ricketts</li> </ul>	<ul style="list-style-type: none"> <li>Nicola Nortcliffe, Cliff Buckton</li> </ul>
13/07/09	40 Melton Street	Environment	<ul style="list-style-type: none"> <li>Kent Farrell, Diane Booth</li> </ul>	<ul style="list-style-type: none"> <li>Amy Fryday, Graeme Pollard, Vidhi Mohan</li> </ul>
04/08/09	Waterloo	M20-22, M25	<ul style="list-style-type: none"> <li>Simon Bretherton</li> </ul>	<ul style="list-style-type: none"> <li>Phil Edwards</li> </ul>



## 15 Appendix D: Mandated confidence grading system

- 15.1.1 This Appendix presents the criteria used for assigning confidence grades under the mandated grading system.
- 15.1.2 The confidence grading system has been established to provide a reasoned basis for undertakers to qualify information in respect to reliability and accuracy. It is essential that proper care and a high level of application is given to the assignment of confidence grades to data requiring such annexation. A quality-assured approach should be employed in the methodology used to assign confidence grades, particularly if sampling techniques are in place.
- 15.1.3 The confidence grade combines elements of reliability and accuracy, for example:
- A2: Data based on sound records etc. (A, highly reliable) and estimated to be within +/- 5% (accuracy band 2);
  - C4: Data based on extrapolation from a limited sample (C, unreliable) and estimated to be within +/- 25% (accuracy band 4);
  - AX: Data based on sound records etc. (A, highly reliable) but value too small to calculate meaningful accuracy percentage.
- 15.1.4 Reliability and accuracy bands are shown in the tables below.

Reliability Band	Description
<b>A</b>	Sound textual records, procedures, investigations or analysis properly documented and recognised as the best method of assessment.
<b>B</b>	As A but with minor shortcomings. Examples include old assessment, some missing documentation, some reliance on unconfirmed reports, some use of extrapolation.
<b>C</b>	Extrapolation from limited sample for which Grade A or B data is available.
<b>D</b>	Unconfirmed verbal reports, cursory inspections or analysis.

Accuracy Band	Accuracy to or within +/-	but outside +/-
<b>1</b>	1%	-
<b>2</b>	5%	1%
<b>3</b>	10%	5%
<b>4</b>	25%	10%
<b>5</b>	50%	25%
<b>6</b>	100%	50%
<b>X</b>	accuracy outside +/- 100 %, small numbers or otherwise incompatible (see table below)	

- 15.1.5 Certain reliability and accuracy band combinations are considered to be incompatible and these are blocked out in the table below.

Compatible Confidence Grades				
Accuracy Band	Reliability Band			
	A	B	C	D
<b>1</b>	A1			
<b>2</b>	A2	B2	C2	
<b>3</b>	A3	B3	C3	D3
<b>4</b>	A4	B4	C4	D4
<b>5</b>			C5	D5
<b>6</b>				D6
<b>X</b>	AX	BX	CX	DX

- 15.1.6 Systems for the acquisition, collation and presentation of regulatory data are expected to have reached an advanced level of development. In most cases, a confidence grade of A2, A3, B2 or better should be expected. Where confidence grades are below these levels, Network Rail should report on their actions for improvement in the commentary for the table concerned.
- 15.1.7 Any deterioration in confidence grades from those reported in the previous Annual Return should be explained together with the action plan for improvement as appropriate.
- 15.1.8 Reports on action plans should include the projected confidence grades, but confidence grades entered in the tables should reflect the current status of the data and not the future status it is intended to achieve.
- 15.1.9 All confidence grades reported should be commented on by the Reporter (or, as appropriate, the Auditor). In each case, they are required to state whether they agree with the confidence grading and if not, provide their opinion. Reporters should also comment on any deterioration, the reason provided by the company, and either the action plan for improvement or justification for limited achievement as noted above. Where there is disagreement between the parties, the Director will normally use the Reporter's assessment of the confidence grade.

## 16 Appendix E: Historical Performance against Target

### 16.1 Summary of Targets

16.1.1 The ORR Access Charges Review 2003 set targets for Control Period 3 (2004/05-2008/09). Figure 16.1.1 shows Network Rail's performance against the regulatory targets reported in the Annual Return.

16.1.2 The colour coding in Figure 16.1.1 is based on the targets:

- (a) Red: outside nominal target (target missed);
- (b) Green: inside the nominal target (target achieved).
- (c) Grey: no regulatory target set.

Measure	05/06 result	06/07 result	07/08 result	08/09 result
Operational Performance				
Total Network Rail caused delay (million minutes)	10.5	10.5	9.5	8.84
Total delay minutes/100 train kms (franchised passenger operators)	1.93	1.92	1.74	1.59
Number of broken rails (M1)	317	192	181	164
Track geometry (M3)				
35mm Top 50%	67.9	70.0	73.6	76.5
35mm Top 90%	91.8	92.3	93.8	94.6
35mm Top100%	98.0	98.1	98.6	98.8
35mm Alignment 50%	78.8	79.0	82.1	82.5
35mm Alignment 90%	94.8	95.0	95.8	96.2
35mm Alignment 100%	97.3	97.5	97.9	98.3
70mm Top 50%	70.5	72.2	74.7	78.3
70mm Top 90%	94.3	94.7	95.5	96.6
70mm Top 100%	96.5	96.7	97.3	97.9
70mm Alignment 50%	83.2	82.9	87.9	89.9
70mm Alignment 90%	97.1	97.3	98.1	98.3
70mm Alignment 100%	98.2	98.3	98.7	98.9
Track geometry – level 2 exceedences (M5)	0.82	0.72	0.59	0.50
Condition of asset TSRs (M4) (Number & Severity)	815	710	628	438
	4,285	3246	2,790	2284
Earthworks Failures (M6)	41	90	107	61
Signalling failures (M9)	23,367	22,704	19,900	19,622
Signalling asset condition (M10)	2.4	2.39	2.38	2.39
Traction power incidents causing train delays (M11 & M12)	49	69	63	66
	6	11	9	14
Electrification condition – a.c. traction feeder stations & track sectioning points (M13)	1.85	1.88	3.53	2.78
Electrification condition – d.c. substations (M14)	1.78	1.64	3.61	2.53
Electrification condition – a.c. traction contact systems (M15)	1.7	1.7	1.7	1.6
Electrification condition – d.c. traction contact system (M16)	1.8	1.9	1.9	1.9
Station condition index (M17)	2.22	2.24	2.71	2.48
Light maintenance depot – condition index (M19)	2.58	2.56	2.49	2.52
Network Rail Asset Stewardship Incentive Index (ASII) (Based on End of CP3 Target)	0.80	0.72	0.63	0.596
Renewals Efficiency: Unit Costs	18.1%	23%	18.3%	18.3%
Renewals Efficiency: Budget Variance			16.3%	24.0%

Figure 16.1.1 Results by measure (2005/06-2008/09), and performance against CP3 Regulatory targets



## 17 Appendix F: Confidence grade trends

### 17.1 Summary of grades

17.1.1 This Appendix presents a summary of the confidence grades which have been assigned to the Annual Return measures over the last four years by:

- Independent Reporter A, Halcrow ('H');
- Independent Reporter B, Mouchel Parkman ('MP');
- Network Rail ('NR').

17.1.2 Figure 17.1.1 shows the confidence grades for the measures reported between 2004/05 and 2008/09. Where no grade was assigned by a particular party, 'NG' has been entered. Where the cells are greyed out for a measure for an entire year, that measure was not reported in that year. Where the cells are greyed out for only one Independent Reporter in a year, the measure was the responsibility of the other Independent Reporter.

Annual Return Measure	2005/06		2006/07		2007/08		2008/09	
	NR	H	NR	H	NR	H	NR	H
	All Measures	Allocated Measures	All Measures					
Operational Performance	NG	B3	NG	<b>B2</b>	NG	<b>A2</b>	NG	<b>A1</b>
Customer & Supplier Satisfaction	NG	A2	NG	<b>A2</b>	NG	<b>A1</b>	NG	<b>A1</b>
Joint Performance Process (JPP)	NG	B3	NG	<b>B2</b>	NG	<b>A1</b>	NG	<b>A1</b>
Route Utilisation Strategies (RUSs)	NG	B1	NG	<b>B2</b>	NG	<b>NG</b>	NG	NG
Linespeed capability (C1)	<b>B2</b>	B2	<b>B2</b>	<b>B2</b>	<b>B2</b>	<b>B2</b>	<b>B2</b>	<b>B2</b>
Gauge capability (C2)	<b>B1</b>	B2	<b>B2</b>	<b>B2</b>	<b>B2</b>	<b>B2</b>	<b>B2</b>	<b>B2</b>
Route availability value (C3)	NG	B2	NG	<b>B2</b>	NG	<b>B2</b>	NG	<b>B2</b>
Electrified track capability (C4)	<b>B2</b>	B3	<b>B2</b>	<b>B2</b>	<b>B2</b>	<b>B2</b>	<b>B2</b>	<b>B2</b>
Mileage	NG	B3	NG	<b>B3</b>	NG	<b>B3</b>	NG	<b>B2</b>
Freight Gross Tonne Miles	NG	B3	NG	<b>B2</b>	NG	<b>B2</b>	NG	<b>B2</b>
Number of broken rails (M1)	<b>A2</b>	<b>A1</b>	<b>A1</b>	<b>A1</b>	<b>A1</b>	<b>A1</b>	<b>A1</b>	<b>A1</b>
Rail defects (M2)	<b>B4</b>	<b>B4</b>	<b>B3</b>	<b>B3</b>	<b>B3</b>	<b>B3</b>	<b>B3</b>	<b>B3</b>
Track geometry (M3 & M5)	<b>A1</b>	<b>A1</b>	<b>A1</b>	<b>A1</b>	<b>A1</b>	<b>A1</b>	<b>A1</b>	<b>A1</b>

Figure 17.1.1 Confidence Grades assigned to Annual Return Measures (2005/06 – 2008/09)

Annual Return Measure	2005/06		2006/07		2007/08		2008/09	
	NR	H	NR	H	NR	H	NR	H
	All Measures	Allocated Measures	All Measures					
Condition of asset TSR sites (M4)	B2	B2	B2	B2	B2	B2	B2	B2
Earthworks Failures (M6)	A2	A2	A2	A2	A2	A2	A2	A2
Bridge condition (M8)	B3	B2	B3	B2	B2	C3	B2	C3
Signalling failures (M9)	B2	C4	B2	C4	NG	C4	NG	C2
Signalling asset condition (M10)	B3	B3	B3	B3	B3	B2	B3	B2
Traction power incidents causing train delays (M11)	B2	B3	B2	B2	B2	B2	B2	B2
Traction power incidents causing train delays (M12)	BX	BX	BX	BX	BX	BX	BX	BX
Electrification condition – a.c. FS & TSP (M13)	B2	B2	B2	B2	BX	BX	BX	XX
Electrification condition – d.c. substations (M14)	B2	B2	B2	B2	BX	BX	BX	XX
Electrification condition – a.c. contact systems (M15)	B3	C3	B3	C3	B4	B3	B4	C3
Electrification condition – d.c. contact system (M16)	B3	C4	B3	C4	B3	C4	B3	C4
Station condition index (M17)	B2	B3	B2	B3	B2	B3	B2	C3
Station facility score (M18)	B2	B2	B2	B2				
Light maintenance depot – condition index (M19)	B3	B4	B2	B4	B2	B4	B2	B4
Asset Stewardship Incentive Index (ASII)	NG	BX	NG	BX	NG	BX	NG	BX
Track Renewal Volumes (M20, M21, M22, M25)	NG	B2	NG	B2	NG	B2	NG	B2
Signalling Renewed (M24)	NG	C4	NG	D3	NG	C3	NG	C4
Structures Volumes (M23)	NG	B2	NG	A3	NG	C3	NG	A2
Structures Volumes (M26-29)	NG	B2	NG	A1	NG	C3	NG	A2
Renewal Efficiency: Unit Costs	NG	B2	NG	B2	NG	B3	NG	B3
Renewal Efficiency: Budget Variance Analysis	NG	B3	NG	B2	NG	B2	NG	B3

Figure 17.1.1(cont) Confidence Grades assigned to Annual Return Measures (2005/06 – 2008/09)

- 17.1.3 Year-on-year changes in the confidence grades given to a measure may be due to:
- (a) Changes to the definition of a measure, agreed by ORR and Network Rail;
  - (b) Changes to the processes for the collection or reporting for a measure;
  - (c) Changes to the accuracy or reliability of a measure for a particular year;
  - (d) Changes to the Independent Reporter's investigation techniques leading to a more comprehensive understanding of the confidence that may be assigned;
  - (e) A maturing of the Independent Reporter's understanding of the collecting or reporting processes for a measure, leading to a more comprehensive application of the confidence grading system.

17.1.4 It should be noted that the Independent Reporters assigning grades over the period shown in Figure 17.1.1 may have used the confidence grading system differently; thus grades should be viewed in conjunction with the individual audit report and commentary for each measure to understand any variations in confidence year-on-year.

## 17.2 Commentary

17.2.1 Notable variations to confidence grades assigned by the Independent Reporters between 2007/08 and 2008/09 are shown in Figure 17.2.1 with a commentary.

Measure	2007/08	2008/09	Commentary
Electrification condition – a.c. contact systems (M15)	<b>B3</b>	<b>C3</b>	A lack of management effort has resulted in a reduction to the quality and accuracy to this data.
Electrification condition – a.c. FS & TSP (M13)	<b>BX</b>	<b>XX</b>	No data collected against the measure this year due to the revised process not being formally approved and issued by Network Rail.
Electrification condition – d.c. substations (M14)	<b>BX</b>	<b>XX</b>	No data collected against the measure this year due to the revised process not being formally approved and issued by Network Rail.
Structures Volumes (M23)	<b>C3</b>	<b>A2</b>	The 2008/09 audit revealed that Network Rail had made significant improvements to the data capture and data management process, giving the Reporter greater confidence in the data accuracy and reliability.
Structures Volumes (M26-29)	<b>C3</b>	<b>A2</b>	The 2008/09 audit revealed that Network Rail had made significant improvements to the data capture and data management process, giving the Reporter greater confidence in the data accuracy and reliability.

Figure 17.2.1 Notable variation for 2007/08-2008/09 Independent Reporter confidence grades



## 18 Appendix G: Material changes to measures

### 18.1 Summary of change

- 18.1.1 In order to assess the comparability of results reported in different years for the purposes of trend analysis, this Appendix presents a summary of:
- Changes to the definition of a measure, agreed by ORR and Network Rail;
  - Changes to the processes for the collection or reporting for a measure.
- 18.1.2 Where other changes are known these are also highlighted, e.g. changes to an underlying assessment methodology which (erroneously) does not form part of the Asset Reporting Manual documentation.
- 18.1.3 Currently, measures are formally documented in one of three locations:
- Network Rail: Asset Reporting Manual for asset management measures;
  - Network Rail: KPI Manual for Network Rail Key Performance Indicators;
  - Office of Rail Regulation: ORR KPI definitions for Network Rail Monitor (NRM).
- 18.1.4 As more measures are added to the Annual Return, a growing number of measures are not formally documented. Not only does this make the audit process less robust, it also makes it difficult to control or identify material change that impacts trend analysis.
- 18.1.5 Figure 18.1.1 shows the changes to documented definitions (DF), procedures (PR), sub-procedures (SP) and manuals (MN) from the Asset Reporting Manual and an assessment of the impact of the change on trend analysis. Changes within 2007/08 are highlighted in blue.
- 18.1.6 To our knowledge, there have been no changes to the definitions in the KPI Manual for Network Rail KPIs or the NRM definitions for ORR KPIs.

Measure	Doc	Rev 1	Rev 2	Rev 3	Rev 4	Rev 5	Rev 6	Rev 7	Impact of change
Linespeed capability (C1)	DF	Nov-00	16/03/01	14/12/01	17/02/04	28/02/05	28/02/07	-	Non-material changes: trend analysis unaffected
	PR	Nov-00	16/03/01	14/12/01	22/03/04	28/02/05	-	-	
Gauge capability (C2)	DF	Nov-00	16/03/01	14/12/01	17/02/04	28/02/05	-	-	Change of source database has not impacted use of trend
	PR	Nov-00	16/03/01	14/12/01	22/03/04	28/02/05	-	-	
Route availability value (C3)	DF	Nov-00	16/03/01	14/12/01	17/02/04	28/02/05	-	-	Change of source database has not impacted use of trend
	PR	Nov-00	16/03/01	14/12/01	22/03/04	28/02/05	-	-	
Electrified track capability (C4)	DF	Nov-00	16/03/01	14/12/01	17/02/04	28/02/05	-	-	Non-material changes: trend analysis unaffected
	PR	Nov-00	16/03/01	14/12/01	22/03/04	28/02/05	-	-	
Number of broken rails (M1)	DF	Nov-00	16/03/01	17/02/04	-	-	-	-	Change of source database has not impacted use of trend
	PR	Nov-00	16/03/01	14/12/01	22/03/04	28/02/05	-	-	
Rail defects (M2)	DF	Nov-00	16/03/01	14/12/01	17/02/04	-	-	-	Non-material changes: trend analysis unaffected
	PR	Nov-00	16/03/01	14/12/01	22/03/04	28/02/05	-	-	
Track geometry (M3)	DF	Nov-00	16/03/01	14/12/01	17/02/04	26/02/08	-	-	Non-material changes: trend analysis unaffected
	PR	Nov-00	16/03/01	14/12/01	22/03/04	28/02/05	26/02/08	-	
Condition of asset TSR (M4)	DF	Nov-00	01/12/00	01/01/01	16/03/01	17/02/04	-	-	Material change to calculation method from 2003/04 (incl.)
	PR	Nov-00	Jan-01	01/01/01	01/02/01	16/03/01	22/03/04	-	
Track geometry (M5)	DF	Nov-00	16/03/01	17/02/04	26/02/08	-	-	-	Non-material changes: trend analysis unaffected
	PR	Nov-00	16/03/01	14/12/01	See M03	-	-	-	
Earthworks Failures (M6)	DF	Nov-00	16/03/01	17/02/04	28/02/05	09/02/07	15/02/08	-	Material changes: trend analysis affected
	PR	Nov-00	16/03/01	22/03/04	28/02/05	-	-	-	
Bridge condition (M8)	DF	Nov-00	16/03/01	14/12/01	17/02/04	28/02/05	-	-	Material changes to SCMI methodology
	PR	Nov-00	16/03/01	14/12/01	22/03/04	28/02/05	-	-	
Signalling failures (M9)	DF	Nov-00	16/03/01	17/10/02	12/11/02	17/02/04	02/03/07	-	Non-material changes: trend analysis unaffected
	PR	Nov-00	16/03/01	22/03/04	02/03/07	-	-	-	
Signalling asset condition (M10)	DF	Nov-00	16/03/01	14/12/01	17/02/04	23/02/07	18/02/08	-	Material changes to SICA methodology 2002/03, 2005/06
	PR	Nov-00	16/03/01	14/12/01	22/03/04	23/02/07	18/02/08	-	

Figure 18.1.1 Changes to measures reported in the Asset Reporting Manual

Measure	Doc	Rev 1	Rev 2	Rev 3	Rev 4	Rev 5	Rev 6	Rev 7	Impact of change
Traction power incidents a.c. (M11)	DF	Nov-00	16/03/01	17/02/04	-	-	-	-	Non-material changes: trend analysis unaffected
	PR	Nov-00	16/03/01	22/03/04	28/02/05	-	-	-	
Traction power incidents d.c. (M12)	DF	Nov-00	16/03/01	17/02/04	-	-	-	-	Non-material changes: trend analysis unaffected
	PR	Nov-00	16/03/01	See M11	-	-	-	-	
a.c. FS & TSP (M13)	DF	Nov-00	16/03/01	17/02/04	07/09/07	-	-	-	Material changes: trend analysis affected
	PR	Nov-00	16/03/01	14/12/01	22/03/04	28/02/05	23/11/06	07/09/07	
d.c. substations (M14)	DF	Nov-00	16/03/01	17/02/04	07/09/07	-	-	-	Material changes: trend analysis affected
	PR	Nov-00	16/03/01	14/12/01	22/03/04	28/02/05	23/11/06	07/09/07	
a.c. contact systems (M15)	DF	Nov-00	16/03/01	17/02/04	21/11/06	10/08/07	-	-	Non-material changes: trend analysis unaffected
	PR	Nov-00	16/03/01	14/12/01	22/03/04	21/11/06	10/08/07	-	
d.c. contact system (M16)	DF	Nov-00	16/03/01	17/02/04	-	-	-	-	Non-material changes: trend analysis unaffected
	PR	Nov-00	16/03/01	14/12/01	22/03/04	-	-	-	
	SP	16/03/01	14/12/01	22/03/04	-	-	-	-	
Station stewardship measure (M17)	DF	Nov-00	16/03/01	17/02/04	-	-	-	-	Non-material changes: trend analysis unaffected
	MN	16/03/01	14/12/01	22/03/04	-	-	-	-	
Station facility score (M18)	PR	Nov-00	16/03/01	14/12/01	22/03/04	-	-	-	Non-material changes: trend analysis unaffected
	DF	Nov-00	Dec-00	16/03/01	17/02/04	-	-	-	
LMD condition index (M19)	PR	Nov-00	05/01/01	07/02/01	16/03/01	22/03/04	28/02/05	-	Non-material changes: trend analysis unaffected
	DF	Nov-00	16/03/01	17/02/04	-	-	-	-	
	MN	16/03/01	22/03/04	-	-	-	-	-	
Track Renewal Volumes (M20)	PR	Nov-00	16/03/01	14/12/01	22/03/04	-	-	-	Non-material changes: trend analysis unaffected
	DF	Nov-00	16/03/01	14/12/01	12/11/02	17/02/04	-	-	
Track Renewal Volumes (M21)	DF	Nov-00	16/03/01	14/12/01	12/11/02	17/02/04	-	-	Non-material changes: trend analysis unaffected
	PR	See M20	-	-	-	-	-	-	
Track Renewal Volumes (M22)	DF	Nov-00	16/03/01	14/12/01	12/11/02	17/02/04	-	-	Non-material changes: trend analysis unaffected
	PR	See M20	-	-	-	-	-	-	
Structures Volumes (M23)	DF	Nov-00	16/03/01	17/02/04	-	-	-	-	Non-material changes: trend analysis unaffected
	PR	22/03/04	-	-	-	-	-	-	
Signalling Renewed (M24)	DF	Nov-00	16/03/01	14/12/01	17/02/04	29/02/08	-	-	Material changes: trend analysis affected
	PR	22/03/04	29/02/08	-	-	-	-	-	
Track Renewal Volumes (M25)	DF	14/12/01	17/02/04	-	-	-	-	-	Non-material changes: trend analysis unaffected
	PR	See M20	-	-	-	-	-	-	
Structures Volumes (M26)	DF	12/11/02	17/02/04	-	-	-	-	-	Non-material changes: trend analysis unaffected
	PR	See M23	-	-	-	-	-	-	
Structures Volumes (M27)	DF	12/11/02	20/02/03	17/02/04	-	-	-	-	Non-material changes: trend analysis unaffected
	PR	See M23	-	-	-	-	-	-	
Structures Volumes (M28)	DF	17/02/04	-	-	-	-	-	-	Non-material changes: trend analysis unaffected
	PR	See M23	-	-	-	-	-	-	
Structures Volumes (M29)	DF	17/02/04	-	-	-	-	-	-	Non-material changes: trend analysis unaffected
	PR	See M23	-	-	-	-	-	-	

Figure 18.1.1(cont) Changes to measures reported in the Asset Reporting Manual

## 18.2 Commentary

- 18.2.1 The use of Annual Return data for the purposes of trend analysis should be undertaken with reference to the individual audit reports and commentaries for each measure to understand any variations in confidence year-on-year or to identify other pertinent issues.
- 18.2.2 There were four material changes within the Asset Reporting Manual which impacted trend analysis this year. These are shaded blue in Figure 18.1.1. The definition and procedure for one additional measure, the Station Stewardship Measure (M17), were material changed this year. However the corresponding Asset Reporting Manual documents had not been revised at the time of publishing this report.

## 19 Appendix H: Network Rail Monitor (NRM)

### 19.1 Measures reported in both NRM and Annual Return

19.1.1 The quarterly Network Rail Monitor can be found on the website of the Office of Rail Regulation, [www.rail-reg.gov.uk](http://www.rail-reg.gov.uk)

19.1.2 Figure 19.1.1 identifies where the same measures are reported in both the Network Rail Monitor and the Annual Return. However, it should be noted:

- (a) The measures in the Annual Return pertain to the full year, whereas the measures in the NRM are collected on a quarterly basis.
- (b) The measures in the Annual Return are finalised full-year figures, whereas the measures in the NRM are “the latest available and may be subject to subsequent update” and “subject to year end verification”.

Measure in Network Rail Monitor	Measure in Annual Return Measure
KPI 1 - Safety risk; RSSB train accident precursor measure (composite)	No equivalent measure
KPI 2 - Passenger train performance; Public performance measure (PPM) (MAA) (%)	Public Performance Measure (PPM); Table 1.1, Section 1 of Annual Return
KPI 3 - Network Rail delay minutes; Number of delay minutes (millions) attributed to Network Rail	National delays to all train services; Table 1.2, Section 1 of Annual Return
KPI 4 (a) – Delays to passenger trains; Network Rail delay minutes to Train operating companies per 100 train km	Delays to passenger train services; Table 1.4, Section 1 of Annual Return
KPI 4 (b) – Delays to freight trains; Network Rail delay minutes to Freight operating companies per 100 train km	Delays to freight train services; Table 1.5, Section 1 of Annual Return
KPI 5 - Asset failures; Number of infrastructure incidents	Asset failure; Table 1.22, Section 1 of Annual Return
KPI 6 - Asset stewardship index (ASI) (Great Britain Only); Composite of seven asset condition measures	Asset Stewardship Incentive Index (ASII); Tables 3.41/3.42, Section 3 of Annual Return
KPI 6 - Asset stewardship index (ASI-R) (England & Wales and Scotland Only); Composite of seven asset condition measures	No equivalent measure
KPI 7 - Activity volumes (track renewals only); % Activity compared with plan	Activity Volume KPI; Included within Table 4.21, Section 4 of Annual Return
KPI 8 (a) - Expenditure (OMR); Operating, maintaining and renewing the network (£ millions)	Expenditure and Efficiency; Included within Tables 6.1 & 6.33
KPI 8 (b) - Expenditure (enhancements); Enhancing the network (£ millions)	Expenditure and Efficiency; Included within Table 6.1
KPI 9 – Financing; Net debt to RAB (Regulatory asset base) ratio (%)	Debt to RAB ratio; Table 7.1, Section 7 of Annual Return
KPI 10 - Financial efficiency index (FEI); Adjusted cost of operations, maintenance and track renewals	No equivalent measure
KPI 11 (a) - Customer satisfaction (TOC); Train operators' attitude to Network Rail	Customer satisfaction – passenger operators; Table 1.31, Section 1 of Annual Return
KPI 11 (b) - Customer satisfaction (FOC); Freight operators' attitude to Network Rail	Customer satisfaction – freight operators; Table 1.32, Section 1 of Annual Return

Figure 19.1.1 Measures reported in both Network Rail Monitor and Annual Return





## 20 Appendix I: Recommendations

Reference code	Recommendation
2008/09-001	<b>Satisfaction recommendation 1.</b> The measure reported is a single element in a much wider survey. We believe there may be benefit in the development of a second score, potentially a composite measure based on a number of attitudinal and experiential questions.
2008/09-002	<b>JPP recommendation 1.</b> We recommend that a standard approach be considered for the presentation of JPIP information in order that documents are able to report essential information with other details left to the appropriate levels.
2008/09-003	<b>JPP recommendation 2.</b> We recommend that a continuing emphasis be placed on achieving deliverables, including the investigation of developing means to better monitor direct causal links between improvement plans laid down in JPIPs and improvements in performance.
2008/09-004	<b>CaSL recommendation 1.</b> We recommend the use of a single source of data will improve the data accuracy and reliability of the output findings. It will also ensure TOC data is a true reflection of the events that took place.
2008/09-005	<b>Late Disruptive Possessions Recommendation 1.</b> It was noted by the audit team that this measure does not seek to normalise the number of LDPs against the level of possession activity. We recommend that the measure be changed and a representative normalising factor be agreed and adopted.
2008/09-006	<b>Late Disruptive Possessions Recommendation 2.</b> Network Rail should work to retain the gains made in the route showing downwards or only slightly upward trends and concentrate on reducing overall levels and trends in Late Disruptive Possessions on the London North Western and London North Eastern Routes.
2008/09-007	<b>Late Disruptive Possessions Recommendation 3.</b> Greater context in terms of trends might be provided if the overall number of possessions and/or the number of requests for Late Disruptive Possessions is also known. We therefore recommend that in future this measure be presented along with data on the overall level of possession activity.
2008/09-008	<b>Recommendation 1:</b> We recommend that new staff inputting the data into the RDMS system at depot level received training and guidance to ensure uniform inputs of all fields of data including year of rail manufacture.
2008/09-009	<b>M4 recommendation 1.</b> Network Rail and the ORR should develop alternative measures that would directly improve management of the Network.
2008/09-010	<b>M4 recommendation 2.</b> The current measure is not used to feed in to improvement programmes with respect to reducing future disruption related to TSRs. Consideration should be given to actively using the information to establish priorities for TSR reduction to maximise the reductions achieved.
2008/09-011	<b>M4 recommendation 3.</b> The severity calculation should be reviewed and revised if possible to ensure that the formulae used to not lead to outputs which over or underestimate the severity of TSRs whose operational impact may not be that great.
2008/09-012	<b>M4 recommendation 4.</b> An electronic document management system should be established at the earliest opportunity to better ensure integrity of document management.
2008/09-013	<b>M4 recommendation 5.</b> The Territory Assurance Engineers should take measures to ensure that reporting to them is as accurate as possible. Headquarters functions should help them develop the means to do this.
2008/09-014	<b>M6 Recommendation 1.</b> The existing M6 measure remains very high level, and is strongly influenced by weather events. We recommend that the asset condition information being collected should be used to form the basis for a new measure for earthworks asset condition, to give a better indication of asset stewardship.

Reference code	Recommendation
2008/09-015	<b>M8 recommendation 1:</b> We recommend that the CARRs database be developed to include SCMI data.
2008/09-016	<b>M8 recommendation 2:</b> We recommend that there is a national annual audit.
2008/09-017	<b>M8 recommendation 3:</b> We recommend that NR commission research into the SCMI second cycle process and that clear instructions are issued to the SEC's.
2008/09-018	<b>M8 recommendation 4:</b> We recommend that the procedure is altered to require that the annual return data is based on the date of examination and not the date of input into the SCMI tool, using compliance to the contractual deadline of 28 days for reporting by SEC's to Network Rail as a means of implementation.
2008/09-019	<b>M8 recommendation 5:</b> We recommend that competency standards are re-introduced to Network Rail company standards.
2008/09-020	<b>M8 recommendation 6:</b> We recommend that the SCMI user group is given the support it requires to enable it to function.
2008/09-021	<b>M9 recommendation 1.</b> A more reliable system is established for the transfer of data between FMS and TRUST. At the current time this information is only transferred verbally and therefore there is room for error or for omission.
2008/09-022	<b>M9 recommendation 2.</b> A system is put in place to ensure that once the delay minutes have been agreed in TRUST this information is updated in FMS.
2008/09-023	<b>M10 recommendation 1.</b> For the fifth year in succession we recommend that the practice of applying adjustment factors should be documented.
2008/09-024	<b>M10 recommendation 2.</b> Infrastructure condition to be reported in line with the number of routes which now exist.
2008/09-025	<b>M10 recommendation 3.</b> A register of competent SICA assessors should be held for each route to comply with NR/L2/SIG/13251 issue 3.
2008/09-026	<b>M11 &amp; M12 recommendation 1.</b> Following discussions with the IMPMs it was agreed that the IMPMs role is nothing more than a mailbox and therefore this role adds nothing to the process. Therefore it is recommended that the IMPMs take ownership of this data and a process to valid this data implemented.
2008/09-027	<b>M11 &amp; M12 recommendation 2.</b> The spreadsheet that is sent to the IMPMs is rather complex and following discussions with the IMPMs it became evident that there was no clear work instruction on how to populate the spreadsheet. It is therefore recommended that a work instruction is developed to ensure that the spreadsheet is completed in a standardised manner.
2008/09-028	<b>M11 &amp; M12 recommendation 3.</b> It is recommended that procedure (NR/ARM/M11PR, February 2005 (issue 4) is updated to reflect the change process, in organisation and the creation on new job titles in Network Rail.
2008/09-029	<b>M15 recommendation 1.</b> We recommend that the new reporting system is fully implemented in 2009 to enable Network Rail to report on national condition instead of a limited coverage area. This will also enable Network Rail to assess a much greater asset sample annually.
2008/09-030	<b>M15 recommendation 1.</b> We recommend that the new reporting system is fully implemented in 2009 to enable Network Rail to report on national condition instead of a limited coverage area. This will also enable Network Rail to assess a much greater asset sample annually.
2008/09-031	<b>M17 recommendation 1.</b> It is recommended that SSM scores and SCI scores be calculated to allow ORR to compare the station asset condition over Control Period 3.
2008/09-032	<b>M17 recommendation 2.</b> It is recommended that the new procedure is clarified to ensure that sufficient guidance is provided to explain in more detail how the SSM score is calculated.
2008/09-033	<b>M17 recommendation 3.</b> It is recommended that the SSM score be calculated as a weighted average, based on the number of stations in each category.
2008/09-034	<b>M17 recommendation 4.</b> The process and definition M17 have been updated this year; however the process is not being followed in three main areas:

Reference code	Recommendation
2008/09-035	<b>M19 recommendation 1.</b> It is recommended that Network Rail HQ carry out checks on the data that is provided by AMEY in CP4 for the LMDs on both an individual sheet basis and a summary levels basis, as the data that is currently being presented is not accurate.
2008/09-036	<b>M20-M22, M25 recommendation 1.</b> Network Rail need to ensure that the OP data for maintenance delivered works is more reliable.
2008/09-037	<b>M200M22, M25 recommendation 2.</b> The change control process being followed in the Territories need to be reviewed to ensure that there clarity regarding the explanation of underlying reasons for variances between planned and actual renewal volumes.
2008/09-038	<b>M24 recommendation 1.</b> We recommend that the procedure document NR/ARM/M24PR be revised to take into account a situation as described in 8.2.13.
2008/09-039	<b>Safety Recommendation 1.</b> Action must be taken to ensure that wrong side failure data collection for failures not related to signalling equipment is carried not overlooked if needed at Route level. It must be made clear to staff responsible for reporting and collation of information that this KPI is not solely concerned with signalling equipment.
2008/09-040	<b>Safety Recommendation 2.</b> A procedure should be put in place to ensure Ellipse data on the numbers of signals is checked regularly to ensure that current reporting continues to be accurate.
2008/09-041	<b>Safety Recommendation 3.</b> Staff collating and recording data for analysis and reporting should ensure that personal accidents counted towards the workforce safety measure do not include accidents to members of the public and not railway staff. Internal training and audit should seek to identify and mitigate the potential for any such errors.
2008/09-042	<b>Safety Recommendation 4.</b> Network Rail should work to ensure as far as reasonably practicable that staff responsible for categorising level crossing incidents understand and apply the correct and clear categorisation and reporting of incidents. It should also ensure that safety performance data relating to level crossings accurately and consistently distinguishes between different types of crossing data, and in particular the exact type of misuse incidents covered by the measure.
2008/09-043	<b>Safety Recommendation 5.</b> Network Rail should work to ensure that staff analysing route crime incidents understand and apply the correct categorisation of incidents, in order to minimise the risk of miscounting.
2008/09-044	<b>Safety Recommendation 6.</b> The reporting of near misses, especially at level crossings, as reported in control logs is left to the driver's discretion. This may lead to arbitrary and therefore inaccurate reporting. Criteria should be agreed with train operators and briefed to all relevant staff as to what constitutes a near miss..
2008/09-045	<b>Safety Recommendation 7.</b> The Level Crossing Safety measure should be clearly defined wherever it is published, and whether it is published wholly or in part, as being a measure of crossing collisions and near misses. It should be made clear that this measure does not count other crossing abuse or misuse. Management of reporting and of any relevant training and briefing should be used to reinforce this point.
2008/09-046	<b>Safety Recommendation 8.</b> Improvement initiatives to be reported in the Annual Return, should be provided so as to ensure that that evidence for the underlying processes can be reviewed and reported on.
2008/09-047	<b>Environment recommendation 1</b> It would be beneficial to carry out a briefing of the Level 2 Standard and KPIs to the responsible parties at all levels within Network Rail and the wider industry, and in the latter case most especially with the contractors and other stakeholders with a direct interest in the measures. This will help ensure understanding of the company's measured environmental deliverables.

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<b>Reference code</b>	<b>Recommendation</b>
2008/09-048	<b>Environment recommendation 2.</b> Network Rail should continue to work with ORR and the FOCs to enable data on freight train emissions to be provided.
2008/09-049	<b>MUC recommendation 1.</b> We recommend that the creation of area based MUC standard costings is rolled out across all Routes and that a National method of variance reporting is instituted.
2008/09-050	<b>MUC recommendation 2.</b> We recommend that labour costs are captured independently to the timesheet system to avoid mis-charging of labour to specific MUC's
2008/09-051	<b>Renewals efficiency recommendation 1.</b> We recommend that NR use the same RPI rates for all assets areas and that these are consistent with those used by the Network Rail Finance team.
2008/09-052	<b>Renewals unit costs recommendation 1.</b> We recommend that Network Rail use the same RPI rates for all assets areas and that these are consistent with those provided by the Network Rail Finance team.
2008/09-053	<b>Renewals budget variance recommendation 1.</b> We recommend that there is consistency between the renewals budget variance figures reported by the asset teams and those reported by the Finance team.

## 21 Appendix J: Observations

<p><b>Satisfaction observation 1.</b> The true value of this survey is more likely to lie not in the scores themselves, but in the changes and improvements that Network Rail make based on this and other KPIs.</p>
<p><b>C1 Observation 1.</b> We are pleased to note that Network Rail have taken our previous recommendation on board and now has a uniform and centralised system in place to record linespeed changes and update the information in GEOGIS.</p>
<p><b>C4 Observation 1</b> We believe the creation of the new Data Quality Team is a positive improvement to this process of data collection and reporting.</p>
<p><b>Management of Late Disruptive Possessions Observation 1.</b> This year the reliability and accuracy of the data has been improved, but the difference between the data reported this year and that reported last year suggests that interpretation would be helped by showing the measure in context. It is therefore recommended that the data be presented along with information on the overall number of possessions and the number of requests for Late Disruptive Possessions. This would enable reported data and trends in Late Disruptive Possessions to be interpreted in the context of the levels and trends in requests and in overall possession numbers.</p>
<p><b>M4 observation 1</b> The existence of sites that skew a route's results can be interpreted as evidence that effort in reducing TSR severity goes into the busiest routes. If this is so it will be the case that lightly used lines where TSRs may be of low consequence in practice are being given undue significance in this measure.</p>
<p><b>M6 Observation 1.</b> Each of the failures is recorded according to NR/WI/CIV/028, and under this specification they are attributed a hazard score. Reporting this hazard score as a part of M6 would enable visibility of trends in the severity of failures, and the risk they pose to the railway.</p>
<p><b>M9 observation 1.</b> Network Rail's initiative to investigate the use of hand held data input devices for FMS failure cause entry, should lead to more consistency and accuracy within FMS. We encourage that this is further investigated. Despite proposals in 2008 this initiative has not been progressed.</p>
<p><b>M10 observation 1.</b> We consider that a simple check be introduced to ensure that the data produced by the assessment process is correctly entered into SIS.</p>
<p><b>M11 &amp; M12 observation 1.</b> We have been advised by the Process and Assurance Engineers that there are some significant incidents that do not cause substantial delay minutes and therefore are not reportable, it is suggested that these issues be summarised in the Network Rail Annual Return.</p>
<p><b>M11 &amp; M12 observation 2.</b> We have some concern that the system of recording failures based on delay minutes (presently 500 minutes, to be revised to 300 minutes) may not pick up all significant system faults. It is possible that a generic component defect may be a serious ongoing issue without creating any failure exceeding the target minutes.</p>
<p><b>Safety Observation 1.</b> Any problems at Route level with lack of reporting of non-signalling wrong side failure may due to historic use of the definition. "Wrong side failure" originated as a signalling systems and equipment term to distinguish from failures where the systems or equipment failed safe as it was designed to do. It has only more recently been extended to cover failures of other types of fixed infrastructure and in the latter respect the relevance may be less well understood, which may explain lack of or under-reporting.</p>
<p><b>Environment observation 1.</b> The measured environmental indicators will take time to establish and therefore it is advised that information reported currently and in the immediate future be read and interpreted with care.</p>
<p><b>MUC observation 1.</b> The method for processing the maintenance unit cost and efficiency data before reporting, including the decision criteria for replacing collected data with estimated data, should be reviewed and subsequently formalised in documentation.</p>
<p><b>MUC observation 2.</b> A systematic approach is required to eliminate data entry errors, such as automated error-checking (such as input masks) in Ellipse to eliminate entry of zero value or very low 'dummy' values (e.g. 1 minute in an 'hours worked' data field).</p>