

Independent Reporter

**Annual Return Audit 2008
Final Report**

September 2008

Halcrow Group Limited

Halcrow

Independent Reporter A
Annual Return Audit 2008
Final Report

Halcrow Group Limited

Halcrow Group Limited
Vineyard House 44 Brook Green London W6 7BY
Tel +44 (0)20 7602 7282 Fax +44 (0)20 7603 0095
www.halcrow.com

Halcrow Group Limited has prepared this report in accordance with the instructions of their clients, ORR and Network Rail, for their sole and specific use. Any other persons who use any information contained herein do so at their own risk.

© Halcrow Group Limited 2008

Independent Reporter A

Annual Return Audit 2008

Final Report

Contents Amendment Record

This report has been issued and amended as follows:

Issue	Revision	Description	Date	Initial
0	1	Draft report compiled	10/06/08	MG
1	0	Interim report	01/07/08	MG/DS
1	1	Final report	11/08/08	MG/DS
1	2	Final report incorporating ORR/NR Comments	15/09/08	VM/DS

1 Executive summary

1.1 Reporter's scrutiny and opinion

Commentary on Annual Return 2008

- 1.1.1 I am pleased to report we have experienced co-operation at all levels within Network Rail which has allowed our audit report to be delivered to schedule. Where additional supporting information has been requested by the audit teams it has in all cases been made available. 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.
- 1.1.2 The figures contained in the Annual Return 2008 indicate that Network Rail has achieved the required regulatory targets with the exception of:
- (a) Earthworks Failures (M6);
 - (b) Electrification Condition – D.C. traction contact systems (M16); and
 - (c) Renewals Efficiency
- 1.1.3 We have found little improvement in the quality and accuracy of the data provided by Network Rail for the purposes of our audits or presented in their Annual Return.
- 1.1.4 In two instances we have sufficient concerns to have downgraded the confidence level of the reported measure from that in our 2007 Audit Report:
- (a) Bridge Condition (M8); and
 - (b) Structures Renewal & Remediation Volumes (M23, M26-29)
- 1.1.5 We have made a number of recommendations to address the process and data quality deficiencies and we will be following these up during the year.
- 1.1.6 We also express our concern over the reliability or quality of the data associated with the following measures
- (a) Earthworks Failures (M6) – we have concerns that application of the revised definition contained in the Asset Reporting Manual will lead to a continued gross under-reporting of incidences of failure, particularly where there are wide-area, multiple asset and multiple instance failures (such as that encountered with flooding)
 - (b) Signalling Failures (M9) – we found systematic errors in definition leading to consistent over-reporting
 - (c) Light Maintenance Depot Condition Index (M19) – we found discrepancies in condition reports and shortcomings in process
 - (d) Signalling Renewals (M24) – we found that SEU calculations were open to interpretation
 - (e) Efficiency: Maintenance Unit Costs – we have continued concern over the current reliability and accuracy of available MUC data
- 1.1.7 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.

- 1.1.8 We restate our considered opinion, given in last year's report, that the specific regulatory targets and performance KPIs for which asset condition and performance data is obtained should, for the next Control Period, be much more closely aligned with widely-accepted asset management performance indicator conventions and with Network Rail's business management needs. Adopting this approach would, in our view, provide both Network Rail and ORR with the ability to obtain more relevant and timely infrastructure asset condition and performance information upon which Network Rail's performance could be judged, both internally and by its stakeholders. At the same time this approach would focus the collective efforts of all concerned on the ground and at Headquarters in Network Rail on the exercise of effective asset management practices and on positively ensuring compliance with (or bettering) regulatory and specific targets. We do not believe that additional resource or time penalty would be incurred.

Reporter's Audit Statement

- 1.1.9 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 the Annual Return 2008 gives a representative view and whether the data reported by Network Rail is consistent with evidence provided to us at audit.
- 1.1.10 We confirm Network Rail has prepared the Annual Return for 2008 in accordance with its regulatory and statutory obligations using procedures prepared by Network Rail and agreed with Office of Rail Regulation.
- 1.1.11 We confirm the Annual Return 2008 was submitted in accordance within the timescale required by Condition 15 of Network Rail's Network Licence.
- 1.1.12 We confirm we have completed audits of the data contained in the Annual Return 2008 relating to the measures contained in the "Form of the 2008 Annual Return" prepared by Network Rail and agreed with the Office of Rail Regulation as per 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 2008. 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 2008.
- 1.1.13 We confirm that, in our opinion, the reported information is a reasonable representation of performance and data has been properly prepared and reported in accordance with agreed procedures, except as specifically identified in our report commentaries.

David Simmons

David Simmons,
Independent Reporter,
Halcrow Group Limited,
August 2008.

1.2 Overview of the Annual Return 2008

Operational Performance

- 1.2.1 **Performance.** The Public Performance Measure (PPM) increased (improved) to 88.9%. The total delay minutes attributable to Network Rail reduced (improved) to 9.5 million minutes. Delay to franchised operators reduced to 1.74 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 2.

Customer & Supplier Satisfaction

- 1.2.5 **Performance.** The 2007/08 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 are 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.** The data reported by Network Rail in the Annual Return is accurate – JPIPs are in place for audited Routes and are leading to significant reductions in delay minutes. We believe 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%, comprising of 40.2km of new line and a net value of 3.2km of track removed due to data cleansing.
- 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 inconsistently applied across the Territories, which has the potential to lead to inaccuracies. We believe C1 should have an accuracy grade of 2.

Gauge capability (C2)

- 1.2.16 **Performance.** The reported net change in the total kilometres of route, compared with last year is an increase of 0.2 %; this has been caused by data cleansing.
- 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 2007/08, or to a sample of ELRs. We were unable to verify the impact of data cleansing on gauge capability. 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 increased by 73.8%; track in RA7-9 and RA10 have shown a reduction. This is due to the RA Verification project undertaken by Network Rail.
- 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 no errors. We were unable to verify the impact of data cleansing on route availability; however, our C1 audit found the net variation due to cleansing on the total network kilometres was 0.1%. 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 0.1% decrease; this variance has been caused by 7km of 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.** One minor error was found, where one ELR was wrongly reported, and the GEOGIS records had not yet been updated. We believe that C4 should have an accuracy grade of 2.

Mileage

- 1.2.25 **Performance.** Passenger train miles have increased by 0.7%, whilst the freight miles decreased by 7.1%. Total train mileage has remained the same at 302.8 million.
- 1.2.26 **Passenger Train Miles Reliability grade.** The definition and procedure for this measure is not documented. A reasonable 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 reasonable 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 found that extracting the data from BIFS and PPS gave rise to two different sets of train miles. We believe that Freight Miles should have an accuracy grade of 3.

Freight Gross Tonne Miles

- 1.2.30 **Performance.** Freight gross tonne miles (GTM) have increased by 3.6% to 31.33 million gross tonne miles.
- 1.2.31 **Reliability grade.** The definition and procedure for this measure is not documented. A reasonable 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.** Although this is the first year in which this measure has been reported, Network Rail has produced two years' worth of data to enable a limited trend comparison to be made. This shows that overall the number of possessions fell from 5,529 in 2006/07 to 4,444 in 2007/08.
- 1.2.34 **Reliability grade.** We believe that the Management of Late Disruptive Possessions should have a reliability grade of B.
- 1.2.35 **Accuracy grade.** We believe that the Management of Late Disruptive Possessions should have an accuracy grade of 3.

Number of broken rails (M1)

- 1.2.36 **Performance.** 181 broken rails were reported for 2007/08. This has continued the downward trend of this measure since 2000/01. The result for 2007/08 is a 5.7% improvement on 2006/07.
- 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 two broken rails or more in 2007/08 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 2007/08, the number of isolated defects found was 22,851, which is 6.2% more defects than found in 2006/07; the length of continuous rail defects found was 339,973 yards, a decrease of 24.6% yards of defects than found in 2006/07.
- 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 2007/08. Our audits have revealed that there is still an inconsistency around the network regarding non-actionable defects (some Areas are excluding them while others are not). Therefore, we believe that M2 should continue with 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 2007/08 reporting year. However, we have also noted that during the 2007/08 year all Areas have made good progress to improve the accuracy of the data in their systems despite significant data corrections in some Areas at the start of the year. However, until the rail defect data has been transferred into the new RDMS system and all Areas can demonstrate that data corrections are at a marginal level, we believe that M2 should continue with an accuracy grade of 3.

Track geometry (M3 & M5)

- 1.2.44 **Performance – National SDs.** The results for 2007/08 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 2007/08 across all Rotes.
- 1.2.46 **Performance – speed band data.** The speed band results show a decrease for all measures compared with 200708
- 1.2.47 **Performance – L2 exceedences.** This year, all Routes had the lowest level of Level 2 exceedences per track mile for the last five years.
- 1.2.48 **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.
- 1.2.49 **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.
- 1.2.50 **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)

- 1.2.51 **Performance.** TSRs are dominated by track-related faults, accounting for 94% of the total number and 98% of the total severity score. The number of TSRs has improved significantly in most categories with earthworks achieving the highest reduction for both the number of sites and for severity scores – 33% and 66% respectively. Although structures saw a 66% increase in the number of sites, it should be noted that this high percentage increase was on a low base – the 2006/07 figure represents just 8 sites.
- 1.2.52 **Regulatory target.** The regulatory targets for this measure have been met.
- 1.2.53 **Reliability grade.** The definition of the measure is clearly documented. Though the procedure has not been updated to reflect the current organisation, it 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.
- 1.2.54 **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 impacted by risks from (a) ESRs being incorrectly input to PPS, and (b) the continuing degree of manual manipulation of raw data to produce the result. We believe M4 should continue to have an accuracy grade of 2.

Earthworks Failures (M6)

- 1.2.55 **Performance.** There were 107 earthworks failures for 2007/08. This was a 15.9% increase in failures compared to 2006/07; 127.7% over the regulatory target. Earthworks failures causing train derailment decreased from 3 in 2006/07 to 0 for the year ended 2007/08.

- 1.2.56 **Regulatory target.** The regulatory target for this measure has not been met.
- 1.2.57 **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.
- 1.2.58 **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)

- 1.2.59 **Performance.** 4,168 bridges were entered into the tool for 2007/08. 76% of bridges are in the top two (out of five) condition grades, 98% are in the top three grades.
- 1.2.60 **Regulatory target.** There is no regulatory target for this measure.
- 1.2.61 **Reliability grade.** The definition for this measure is documented. The process of condition inspections is subjective, and there have been no instructions from Network Rail as to the manner in which to conduct second cycle examinations. We believe the M8 measure should have a reliability grade of C.
- 1.2.62 **Accuracy grade.** Whilst the SCMI process is well established, we have significant concerns on the ongoing accuracy of data now being collected. This is primarily due to Network Rail paying insufficient attention to the process. We believe the M8 measure should have an accuracy grade of 3.

Signalling failures (M9)

- 1.2.63 **Performance.** There were 19,900 incidents attributed to signalling failures causing more than 10 minutes delay; this is an improvement of 12% from 2006/07.
- 1.2.64 **Regulatory target.** The regulatory target for this measure has been met.
- 1.2.65 **Reliability grade.** The definition for this measure is clearly documented. A documented process has been followed to collect and report this measure. The commentary is based on data from the FMS system, which does not correlate well with TRUST. Steps are being taken in some Areas to align TRUST data and FMS data which does result in delays attributed to signalling failures to be reduced., because there are faults which cause less than 10 minutes delay to trains or no delay. 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 Territories. We believe that M9 should have a reliability grade of C.
- 1.2.66 **Accuracy grade.** The process of delay attribution is a subjective process often undertaken with considerable time pressure. Systematic errors introduced by the mismatch between the definition of this measure and the advice in the Delay Attribution Guide mean that this measure is over-reported but in a consistent manner. We believe that the accuracy of the data and commentary cannot be in any case better than 10%, hence we believe that M9 should have an accuracy grade of 4.

Signalling asset condition (M10)

- 1.2.67 **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, 76% of crossing are in the band 2 (10 to 20 years remaining life)
- 1.2.68 **Regulatory target.** The regulatory target for this measure has been met.

- 1.2.69 **Reliability grade.** The definition for this measure is clearly documented in a slightly revised ARM document. A documented process has been followed to collect and report this measure. In 2007/08 Network Rail has maintained the standard of management of condition data and SIS has proved to be a valuable tool in the asset management process. The process has been undertaken by persons with suitable levels of expertise supplemented by documented guidance and oversight by others. We believe that M10 should have a reliability grade of B.
- 1.2.70 **Accuracy grade.** The assessment process for determining remaining asset life is subjective but adequately allows prioritisation of renewals. The peer review process by Headquarters Engineers provides independent check on the accuracy of the resulting SICA scores against experience. The process for carrying out the assessments and producing condition reports remains robust, but subjective to a small extent. The procedures for entry of data are not documented. There is 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)

- 1.2.71 **Performance – M11.** For 2007/08, the result reported by Network Rail was 63, which is a decrease of 9% from the number reported in 2006/07.
- 1.2.72 **Performance – M12.** For 2007/08, the result reported by Network Rail was 9, which is a decrease of 18% from the number reported in 2006/07.
- 1.2.73 **Regulatory target.** The regulatory target for this measure has been met.
- 1.2.74 **Reliability grade.** The definitions for these measures are clearly documented. A single documented process has been followed to collect and report these measures. 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.
- 1.2.75 **Accuracy grade (M11).** Our samples found the data was recorded in the Headquarters spreadsheet with only a few minor inaccuracies and the Territories could justify their reasoning for the rejected incidents. We believe that M11 should have an accuracy grade of 2.
- 1.2.76 **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. The accuracy grade for M12 is therefore 'X' to indicate that an accuracy grade cannot be properly ascribed (as stipulated in the confidence grading guidance; Appendix D).

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

- 1.2.77 **Performance.** Based on the new methodology, 71% of assets were in condition grade 4; 98% were in the top four.
- 1.2.78 **Regulatory target.** Achievement of the regulatory target for this measure can not be assessed.
- 1.2.79 **Reliability grade.** The definition for this measure is clearly documented. A single documented process has been followed to collect and report this measure. The process of condition assessment has become more quantitative, however still contains subjective elements. We believe that M13 should have a reliability grade of B.
- 1.2.80 **Accuracy grade.** Our samples found the data was recorded accurately in the Headquarters spreadsheet this year. However the new process for data collection has only been used for 14% of the asset population which is insufficiently large to support a numeric assessment of the accuracy of this measure. The accuracy grade for M13 is therefore 'X' to indicate that an accuracy grade cannot be properly ascribed (as stipulated in the confidence grading guidance; Appendix D).

Electrification condition – d.c. substations (M14)

- 1.2.81 **Performance.** Based on the new methodology, 80% of assets were in condition grade 4; 100% were in the top four.
- 1.2.82 **Regulatory target.** Achievement of the regulatory target for this measure can not be assessed.
- 1.2.83 **Reliability grade.** The definition for this measure is clearly documented. A single documented process has been followed to collect and report this measure. The process of condition assessment has become more quantitative, however still contains subjective elements. We believe that M14 should have a reliability grade of B.
- 1.2.84 **Accuracy grade.** Our samples found the data was recorded accurately in the Headquarters spreadsheet this year. However the new process for data collection has only be used for 1% of the asset population which is insufficiently large to support a numeric assessment of the accuracy of this measure. The accuracy grade for M14 is therefore 'X' to indicate that an accuracy grade cannot be properly ascribed (as stipulated in the confidence grading guidance; Appendix D).

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

- 1.2.85 **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.
- 1.2.86 **Regulatory target.** The regulatory target for this measure has been met.
- 1.2.87 **Reliability grade.** The definition for this measure is clearly documented. A single documented process has been followed to collect and report this measure. The process of condition assessment has become more quantitative, however still contains subjective elements. We believe that M15 should have a reliability grade of B.
- 1.2.88 **Accuracy grade.** Our samples found the data was recorded accurately in the Headquarters spreadsheet this year. However, the process of condition assessment is subjective and only 30% of the asset population has been assessed. We remain concerned by the method of calculation the Network average by rounding down of individual scores. We believe that M15 should have an accuracy grade of 3.

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

- 1.2.89 **Performance.** 77% 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.
- 1.2.90 **Regulatory target.** The regulatory target for this measure has not been met.
- 1.2.91 **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, as stipulated in the confidence grading guidance (Appendix D).
- 1.2.92 **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)

- 1.2.93 **Performance.** 97% of assets assessed to date using the Station Stewardship Measure methodology were in the top three (out of five) condition grades; 100% were in the top four.
- 1.2.94 **Regulatory target.** Achievement of the regulatory target for this measure can not be assessed.

- 1.2.95 **Reliability grade.** The definition for this measure is documented but has not been finalised or issued. The process for condition assessment is subjective. The defined scoring system is non-linear and ensures that averaged scores almost entirely falls in one of three scores. We believe that M17 should have a reliability grade of B.
- 1.2.96 **Accuracy grade.** We still have concerns regarding the subjective nature of this measure especially the application of asset remaining life; however we feel the programme of training courses has provided more consistency. We believe that M17 should have an accuracy grade of 3.

Light maintenance depot – condition index (M19)

- 1.2.97 **Performance.** 56% of assets assessed to date using the depot condition assessment methodology were in the top two (out of five) condition grades; 95% were in the top three.
- 1.2.98 **Regulatory target.** The regulatory target for this measure has been met.
- 1.2.99 **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.
- 1.2.100 **Accuracy grade.** We found a few discrepancies in the reports for this measure which have minor impacts on the results. 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)

- 1.2.101 **Performance.** The ASII for 2007/08 was reported as 0.634, which represents a 12% improvement in the ASII figure from 2006/07. 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.
- 1.2.102 **Regulatory target.** The regulatory target for this measure has been met.
- 1.2.103 **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.
- 1.2.104 **Accuracy grade.** This measure is a composite of other measures in the Annual Return 2008. 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)

- 1.2.105 **Performance.** Non-WCRM sleeper and ballast renewal rose between 2003/04 and 2006/07, but however fell in 2007/08. Non-WCRM rail renewals increased between 2004/05 and 2005/06, but have been falling over the last three years. Non-WCRM full S&C renewals have risen by 59% over the last five years but declined by 11% this year to 373 units.
- 1.2.106 **Regulatory target.** There is no regulatory target for this measure.
- 1.2.107 **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.

- 1.2.108 **Accuracy grade.** The data has been reported by the II teams based on the MBR Reports, however minor discrepancies have been found between this data and the summary volumes extracted from the P3e database. No errors were found in the P3e data for a sample of projects in London North Eastern and London North Western. We believe that the track renewals measures (M20, M21, M22, M25) should have an accuracy grade of 2.

Signalling Renewed (M24)

- 1.2.109 **Performance.** There has been a significant increase in the number of SEU renewed in 2007/08 as compared to the previous reporting period. A total of 1,441 SEU were reported as being renewed as compared to the Network Rail Business Plan target of 924. This represented an increase of nearly 200% compared to 2006/07.
- 1.2.110 **Regulatory target.** There is no regulatory target for this measure.
- 1.2.111 **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 Headquarters 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.
- 1.2.112 **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. We believe M24 should have an accuracy grade of 3.

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

- 1.2.113 **Performance.** Performance cannot be commented upon due to the unreliability of the data.
- 1.2.114 **Regulatory target.** There is no regulatory target for this measure.
- 1.2.115 **Reliability grade.** The definitions for these five measures are clearly documented. However, the process has not been followed and data has been extrapolated from a limited sample of CAF data. Hence we therefore conclude that the measures M23, M26, M27, M28, and M29 should have a reliability grade of C.
- 1.2.116 **Accuracy grade.** We believe that the measures M23, M26, M27, M28, and M29 should have an accuracy grade of 3.

Safety

- 1.2.117 **Performance.** The Accident Frequency Rate for Network Rail employees and contractors for 2007/08 was 0.226. This is a 14% reduction over the figure reported in 2006/07. The number of Infrastructure Wrongside Failures has fallen by 4.7% over the year, and by 20% over the past 2 years. Over the year 2007/08 the Moving Annual Average for level crossing misuse (measured as equivalent collisions) has risen from 26.38 to 28.46 although this is still below the MAA of 32.23 recorded in 2005/06. The level of actual collisions (car and pedestrian) is 16, the same as in 2006/07. The number of Category A SPADs increased in 2007/08 by a factor of 6% over the 2006/07 figure and 8% over that for 2005/06. The number of Operating Irregularities rose slightly during 2007/08 with the results for the year showing a 1.6% increase over results for 2006/07. Performance against the Criminal Damage measure shows significant improvement over the 2006/07 position, with the number of absolute incidents reducing 10.3%.
- 1.2.118 **Regulatory target.** There is no regulatory target for this measure.
- 1.2.119 **Reliability grade.** We believe that Safety should have a reliability grade of B.
- 1.2.120 **Accuracy grade.** We believe that Safety should have an accuracy grade of 2.

Environment

- 1.2.121 **Performance.** We can confirm that an environmental policy exists and is disseminated throughout the organisation.

- 1.2.122 **Reliability grade.** We believe that Environment should have a reliability grade of A.
- 1.2.123 **Accuracy grade.** We believe that Environment should have an accuracy grade of X as no tangible, reportable data presently exists.

Maintenance Efficiency

Maintenance Budget Variance

- 1.2.124 **Performance.** Variance against maintenance allowance is 28.5% which is better than target. 2004/05-2007/08 variance for maintenance expenditure normalised by ETMs is 31% which is better than target.
- 1.2.125 **Regulatory target.** The regulatory target for this measure has been met.
- 1.2.126 **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.
- 1.2.127 **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

- 1.2.128 **Performance.** Maintenance NST Period 13 reports show that an average of 369 work orders per week (c. 0.49%) had work volumes which were zero or work hours which were zero or 1 minute. This is comparable with 2006/07 performance which was an average of 587 per week. Maintenance NST Period 12 reports show there were 225,061 errors in Ellipse for seven key asset data fields.
- 1.2.129 **Regulatory target.** The benchmarks for calculating efficiency levels have not yet been agreed. Network Rail does not expect these measures to be robust enough for benchmarking.
- 1.2.130 **Reliability grade.** 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. However, the data quality processes are disjointed and there are known problems with the initial capture of work volumes. We believe the maintenance unit cost data should have a reliability band of C.
- 1.2.131 **Accuracy grade.** The variation in the dataset appears quite large. Statistical analysis of the dataset is required to attribute this variation to collection error or to genuine differences in the underlying unit rates; however, given the known issues with the underlying data collection process, it is likely the larger portion of this variation is from process error not underlying differences in unit costs. We believe the maintenance unit cost data should have an accuracy band of 5.

Renewals Efficiency

Renewal Unit Costs – Track

- 1.2.132 **Performance.** 84.5% of track renewals expenditure has been reported as unit costs. Plain line track renewal efficiency is down from 17.2% last year to 10.8% this year. Significantly improved S&C efficiencies are reported, down from 10.2% last year to 9.9% this year. The track composite rates show plain line improving marginally to 10.6% for the Control Period and S&C up by 2.9% to 22.2% for the Control Period.
- 1.2.133 **Reliability grade.** The processes used to source the data for this measure are documented, frequently used and subject to a number of layers of internal check and review and to external audit by others. 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.

- 1.2.134 **Accuracy grade.** The processes used to source the data for this measure are frequently used and subject to a number of layers of internal check and review and to external audit by others. The financial data is not solely based on final accounts, which may mean the reported data is subject to some inaccuracy. We have found a source of error and inconsistency from price rebasing. We therefore believe the unit cost indices and composite rates should have an accuracy grade of 3.

Unit Costs – Structures, Signalling & Telecoms

- 1.2.135 **Performance.** Structures efficiency has improved by 1.5% this year to 26.4% over the Control Period. Telecoms efficiency has improved by 13.0% this year to 25.7%. Signalling efficiency has decreased significantly to 29.4% for the Control Period – this latter figure largely appears to be the unit cost settling as the data set expands.
- 1.2.136 **Reliability grade.** The processes used to source the data for this measure are documented, frequently used and subject to a number of layers of internal check and review and to external audit by others. 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.
- 1.2.137 **Accuracy grade.** The processes used to source the data for this measure are frequently used and subject to a number of layers of internal check and review and to external audit by others. 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

- 1.2.138 **Performance.** The total renewals budget shows a 18.3% level of efficiency, comprising strong performances in all asset classes except track which achieved 11.8% efficiency.
- 1.2.139 **Reliability grade.** The procedure for this measure is documented. However, there was evidence of the categorisation process not being followed correctly. We believe the renewals budget variance analysis should have a reliability grade of B.
- 1.2.140 **Accuracy grade.** There was evidence of systematic errors leading to over-attribution to Scope Change. The internal audit by Network Rail led to re-attribution of some variances demonstrating a success for this method of quality assurance; however, as this process was undertaken post-audit using limited information it is possible that not all cases have been correctly identified. We believe the renewals budget variance analysis should have an accuracy grade of 2.

Renewals Efficiency

- 1.2.141 **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. We concur with Network Rail's conclusion that it looks unlikely the ORR target of 31% reduction in renewals costs in Control Period 3 will be met.

Debt/ RAB Ratio

- 1.2.142 **Performance.** The results for 2007/08 show that Network Rail's net debt as a percentage of its RAB was 69.4% which meets the requirements of its Network Licence.
- 1.2.143 **Regulatory target.** There is no regulatory target for this measure.
- 1.2.144 **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.
- 1.2.145 **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

- 1.2.146 **Performance.** The current forecast RAB adjustment for the volume incentive in 2008/09 is £382.6m (2007/08 prices).
- 1.2.147 **Regulatory target.** There is no regulatory target for this measure.

- 1.2.148 **Reliability grade.** This is an indicative measure only; the incentive payment will be calculated at year-end 2008/09. The actual and forecast data are 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 band of B.
- 1.2.149 **Accuracy grade.** Some of the data used is forecast. 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 band 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 2007/08 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	2007/08 Target	2007/08 Result
Operational Performance (NR caused delay (million minutes) & Total delay minutes/100 train km)	A2	≤9.8 ≤1.8	9.5 1.74
Customer & Supplier Satisfaction	A1	n/a	n/a
Joint Performance Process (JPP)	A1	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)	B3	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	181
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 ≤4,622	628 2,790
Earthworks Failures (M6)	A2	≤47	107
Bridge condition (M8)	C3	n/a	n/a
Signalling failures (M9)	C4	≤28,098	19,900
Signalling asset condition (M10)	B2	≤2.5	2.38
Traction power incidents causing train delays (M11)	B2	≤107	63
Traction power incidents causing train delays (M12)	BX	≤30	9
Electrification condition – a.c. traction feeder stations & track sectioning points (M13)	BX	n/a	3.53
Electrification condition – d.c. substations (M14)	BX	≤2.2	3.61
Electrification condition – a.c. traction contact systems (M15)	B3	≤1.8	1.7
Electrification condition – d.c. traction contact system (M16)	C4	≤1.8	1.9
Station condition index (M17)	B3	n/a	2.71
Light maintenance depot – condition index (M19)	B4	≤2.63	2.49
Network Rail Asset Stewardship Incentive Index (ASII)	BX	≤0.90	0.63
Track Renewal Volumes (M20, M21, M22, M25)	B2	n/a	n/a
Signalling Renewed (M24)	C3	n/a	n/a
Structures Renewal & Remediation Volumes - (M23) (M26, M27, M28, M29)	C3	n/a	n/a
Maintenance Efficiency: Budget Variance	A1	≥28%	28.5%
Maintenance Efficiency: Unit Costs	C5	n/a	n/a
Renewals Efficiency: Unit Costs – Track	B3	≥26%	16.3%
Renewals Efficiency: Unit Costs – Structures, S&T	B2		
Renewals Efficiency: Budget Variance	B2		
Debt/ RAB Ratio	A1	n/a	n/a
RAB Volume Incentive	B3	n/a	n/a

Figure 1.3.1 Confidence grades targets and results for measures in Annual Return 2008

2 Content

1	Executive summary	1
1.1	Reporter's scrutiny and opinion	1
1.2	Overview of the Annual Return 2008	3
1.3	Confidence grades and results against targets	15
2	Content	17
3	Introduction	19
3.1	Background	19
3.2	This report	20
4	Assessment of compliance	21
4.1	Compliance with requirements	21
4.2	Regulatory targets	22
4.3	Confidence grades	23
5	Audit report and commentary – Operational performance	25
5.1	Operational Performance	27
5.2	Customer & Supplier Satisfaction	33
5.3	Joint Performance Process	38
6	Audit report and commentary – Network capability	41
6.1	Linespeed capability (C1)	43
6.2	Gauge capability (C2)	46
6.3	Route availability value (C3)	49
6.4	Electrified track capability (C4)	51
6.5	Mileage	53
6.6	Freight Gross Tonne Miles	56
6.7	Management of Late Disruptive Possessions	58
7	Audit report and commentary – Asset Management	61
7.1	Number of broken rails (M1)	63
7.2	Rail defects (M2)	68
7.3	Track geometry (M3 & M5)	73
7.4	Condition of asset temporary speed restriction sites (M4)	78
7.5	Earthworks Failures (M6)	85
7.6	Bridge condition (M8)	89
7.7	Signalling failures (M9)	96
7.8	Signalling asset condition (M10)	100
7.9	Traction power incidents causing train delays (M11 & M12)	105
7.10	Electrification condition – a.c. traction feeder stations & track sectioning points (M13) 110	
7.11	Electrification condition – d.c. substations (M14)	115
7.12	Electrification condition – a.c. traction contact systems (M15)	119
7.13	Electrification condition – d.c. traction contact system (M16)	123
7.14	Station stewardship measure (M17)	126
7.15	Light maintenance depot – condition index (M19)	132

7.16	Network Rail Asset Stewardship Incentive Index (ASII)	136
8	Audit report and commentary – Activity Volumes.....	139
8.1	Track Renewal Volumes (M20, M21, M22, M25)	141
8.2	Signalling Renewed (M24).....	146
8.3	Structures Renewal & Remediation Volumes (M23, M26, M27, M28, M29)...	149
9	Audit report and commentary – Safety and Environment	153
9.1	Safety	155
9.2	Environment.....	163
10	Audit report and commentary – Expenditure and Efficiency	169
10.1	Maintenance Efficiency	171
10.2	Renewals Efficiency	180
10.3	Debt to RAB Ratio.....	192
10.4	RAB Volume Incentives	194
11	Reporter’s scrutiny and opinion.....	197
11.1	Commentary on Annual Return 2008	197
11.2	Reporter’s Audit Statement.....	199
12	Appendix A: Table of figures	201
13	Appendix B: Glossary of Acronyms	205
14	Appendix C: Audit meeting schedule	209
15	Appendix D: Mandated confidence grading system	217
16	Appendix E: Historical Performance against Target.....	219
16.1	Summary of Targets	219
17	Appendix F: Confidence grade trends.....	221
17.1	Summary of grades.....	221
17.2	Commentary	223
18	Appendix G: Material changes to measures	225
18.1	Summary of change.....	225
18.2	Commentary	226
19	Appendix H: Network Rail Monitor (NRM)	227
19.1	Measures reported in both NRM and Annual Return	227
20	Appendix I: Recommendations	229
21	Appendix J: Observations	233

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.

Contract Schedule	Reporter
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) ¹

Figure 3.1.1 Allocation of Reporting Role to Reporters

¹ 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 2008 in respect of the 2007/08 financial year.
- 3.2.2 A programme of audits took place in March, April, May and June 2008 at the offices of Network Rail's Headquarters, Territories 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.

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, Territory 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 2008 is compliant with ORR's requirements as set out in the "Form of the 2008 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 2008.

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 2007/08 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	07/08 target	07/08 result
Operational Performance		
Total Network Rail caused delay (million minutes)	≤9.8	9.5
Total delay minutes/100 train kms (franchised passenger operators)	≤1.8	1.74
Number of broken rails (M1)	300	181
Track geometry (M3)		
35mm Top 50%	62.3	73.6
35mm Top 90%	89.2	93.8
35mm Top100%	97.0	98.6
35mm Alignment 50%	72.6	82.1
35mm Alignment 90%	92.9	95.8
35mm Alignment 100%	96.5	97.9
70mm Top 50%	63.4	74.7
70mm Top 90%	92.3	95.5
70mm Top 100%	95.3	97.3
70mm Alignment 50%	79.2	87.9
70mm Alignment 90%	95.7	98.1
70mm Alignment 100%	97.2	98.7
Track geometry – level 2 exceedences (M5)	0.9	0.59
Condition of asset TSRs (M4)		
Number	≤942	628
Severity	≤4,622	2790
Earthworks Failures (M6)	≤47	107
Signalling failures (M9)	≤28,098	19900
Signalling asset condition (M10)	≤2.5	2.38
a.c. traction power incidents causing train delays (M11)	≤107	63
d.c. Traction power incidents causing train delays (M12)	≤30	9
Electrification condition – a.c. traction contact systems (M15)	≤1.8	1.7
Electrification condition – d.c. traction contact system (M16)	≤1.8	1.9
Light maintenance depot – condition index (M19)	≤2.63	2.49
Network Rail Asset Stewardship Incentive Index (ASII)	≤0.90	0.63
Maintenance Efficiency: Budget Variance	≥28%	28.5%
Renewals Efficiency: Unit Costs – Track	≥26%	16.3%
Renewals Efficiency: Unit Costs – Structures, S&T		
Renewals Efficiency: Budget Variance		

Figure 4.2.1 Performance against regulatory targets in Annual Return 2008

4.2.3 In 2007/08, 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 2008 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	2008 Confidence Grade
Operational Performance	A2
Customer & Supplier Satisfaction	A1
Joint Performance Process (JPP)	A1
Linespeed capability (C1)	B2
Gauge capability (C2)	B2
Route availability value (C3)	B2
Electrified track capability (C4)	B2
Mileage (Passenger)	B2
Mileage (Freight)	B3
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)	C4
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)	BX
Electrification condition – d.c. substations (M14)	BX
Electrification condition – a.c. traction contact systems (M15)	B3
Electrification condition – d.c. traction contact system (M16)	C4
Station condition index (M17)	B3
Light maintenance depot – condition index (M19)	B4
Network Rail Asset Stewardship Incentive Index (ASII)	BX
Track Renewal Volumes (M20, M21, M22, M25)	B2
Signalling Renewed (M24)	C3
Structures Renewal & Remediation Volumes (M23, M26-M29)	C3
Safety	B2
Environment	AX
Maintenance Efficiency: Variance	A1
Maintenance Efficiency: Unit Costs	C5
Renewals Unit Cost - Track	B3
Renewals Unit Cost – Structures, Signalling & Telecoms	B2
Renewals Budget Variance	B2
Debt/ RAB Ratio	A1
RAB Volume Incentive	B3

Figure 4.3.1 Confidence grades for the measures in Annual Return 2008

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 2008, Section 1, Operational Performance, including Tables 1.1 – 1.30
- 5.1.2 The measure reports:
- (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) for which Network Rail is responsible;
 - (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 The definition and procedures for this measure are documented in ORR KPIs 2 - 4.
- 5.1.4 Audits were undertaken at Network Rail Headquarters.

Commentary on reported data

Regulatory target

- 5.1.5 The PPM combines figures for punctuality and reliability into a single performance measure. PPM expresses the percentage of a franchised passenger operator's trains which arrive at, or within a specified number of minutes of, their advertised arrival time at their destination, with an allowance made for cancellations. The result is expressed as a moving annual average (MAA). There is no regulatory target for PPM. The industry objective for PPM for 2007/08 was to achieve at least 89.5%. The result for 2007/08 is 89.9%.
- 5.1.6 ORR has set Network Rail the objective of meeting or improving upon the targets for minutes delay attributed to Network Rail on a declining trajectory as set out in the Access Charges Review 2003.
- (a) The regulatory target for delays to all passenger and freight train services attributable to Network Rail in 2007/08 was 9.8 million delay minutes. The result reported by Network Rail for 2007/08 was 9.5 million delay minutes which would meet the regulatory target.
 - (b) The regulatory target for delays to franchised operators in 2007/08 was 1.80 minutes per 100 train km. The result reported by Network Rail for 2007/08 was 1.74 minutes per 100 train km, meeting the regulatory target.
- 5.1.7 There is no regulatory target for infrastructure incidents recorded for attribution of delay (ORR KPI 4).

Trends

- 5.1.8 Nationally, PPM have shown significant improvement over the past four years, from 83.6% in 2004/5 to the current level of 89.9%. The changes to franchise ownership and boundaries over the last four years have been significant; it is therefore difficult to draw comparisons at a TOC level. Where year on year comparisons can be made, it can be shown that improvements have been achieved across all operators. Most significant amongst these is Arriva Trains Wales, where improvements were delivered equivalent to 4.8 percentage points.

5.1.9 Figure 5.1.1 shows that the minutes delay per 100 train kilometres for all operators decreased (improved) by 9.5% compared to 2006/07, with decreases across all categories of delay. In percentage terms, the greatest decrease was 20.9% for 'Autumn leaf fall & adhesion'. In numeric terms, the greatest decrease was 486,066 minutes for "other asset defects".

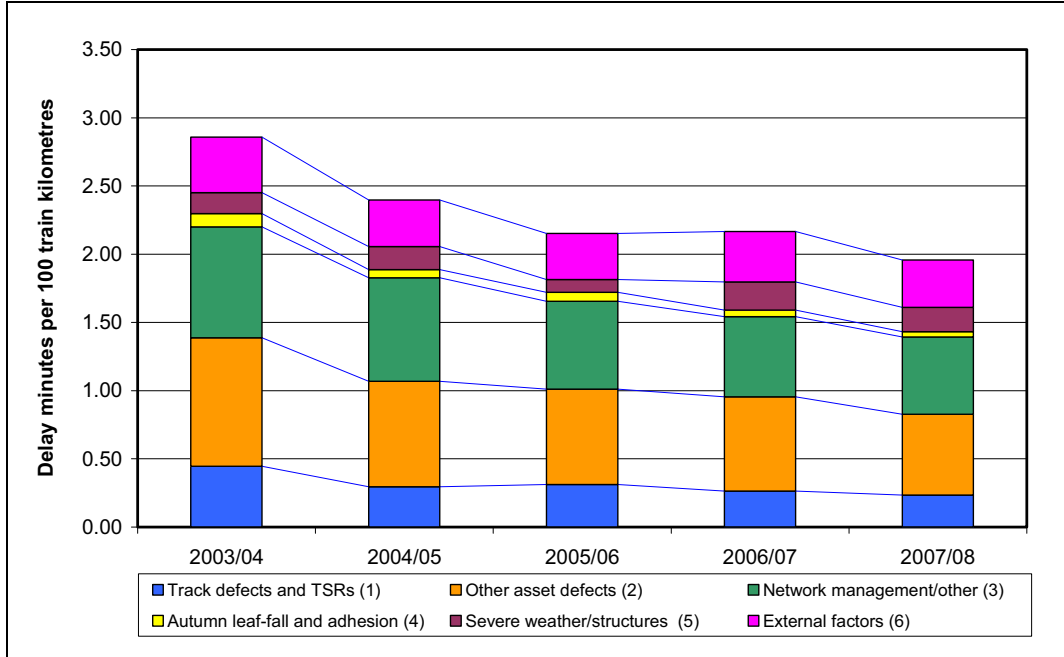


Figure 5.1.1 Delay Minutes per 100 train kilometres²

5.1.10 Figure 5.1.2 shows that the number of infrastructure incidents causing delay decreased overall by 8% compared to 2006/07. All routes experienced a reduction in the total number of infrastructure incidents, with the exception of Sussex which recorded a 0.3% increase driven mainly by an increase in the numbers of points failures and track faults (including broken rails).

² Figure 5.1.1: (1) 'Track defects & TSRs' include broken rails, other track faults and speed restrictions for condition of track and rolling contact fatigue. (2) 'Other asset defects' include points, track circuits, signal and signalling system failures, overhead power/third rail supply etc. (3) 'Network management/ other' includes possessions, signalling errors, timetabling, dispute resolution and unexplained. (4) 'Autumn leaf fall & adhesion' include leaf fall related delays and Network Rail's share of industry adhesion delays. (5) 'Severe weather/ structures' includes direct delays due to severe weather and all structures delays, which include weather related delays due to embankment instability risks, bridge scour and flooding; heat-related speed restrictions are also shown within this category. (6) 'External factors' include road-related incidents, fires, trespass and vandalism, security alerts, suicides and other external events.

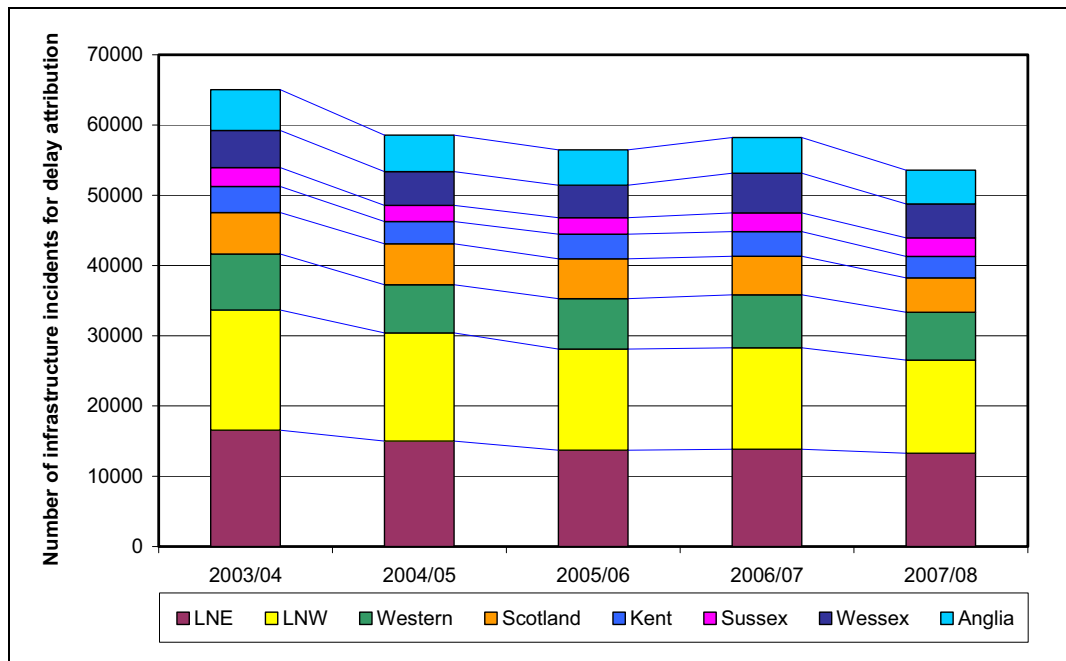


Figure 5.1.2 Number of infrastructure incidents per Route recorded for delay attribution

5.1.11 For the following categories the numbers of incidents for 2007/08 are at their lowest level reported within the last 5 years:

- (a) 101 Points failures;
- (b) 103 Level crossing failures;
- (c) 104A TSR's Due to Condition of Track;
- (d) 112 Fires starting on Network Rail infrastructure;
- (e) 201 Overhead line/Third rail faults;
- (f) 301A Signal Failures;
- (g) 301B Track Circuit Failures;
- (h) 302B Other signal equipment failures;
- (i) 304A Change of aspects-no fault found.

5.1.12 In contrast, the following elements are at their highest level for 5 years:

- (a) 106 - Other infrastructure;
- (b) 108 - Mishap - infrastructure causes;
- (c) 304 - Cable faults (signalling & comms.).

5.1.13 Some of these categories can be explained in relation to external factors, such as cable theft, where continued high prices for commodities continue to make the theft of copper based and other materials a risk.

5.1.14 Our calculations suggest that delay minutes per incident have fallen from 181 minutes in 2006/07 to 177 minutes in 2007/08, suggesting that genuine improvements are being made in the time taken to recover from incidents. Over the past six years delay minutes per incident have decreased steadily from a high of 225 delay minutes per incident experienced in 2002/03. This trend is shown in Figure 5.1.3.

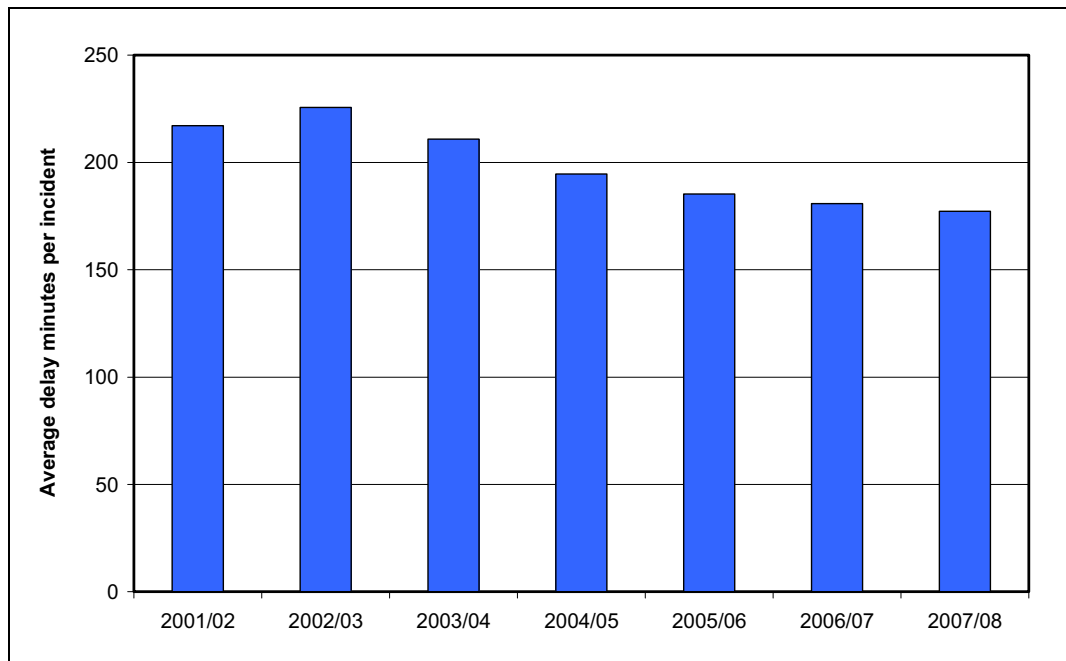


Figure 5.1.3 Average delay minutes per incident

Audit findings

Process

- 5.1.15 Source data for the measure is derived from the TRUST train monitoring system, via PUMPS (see 5.1.18 below). TRUST is a computerised system holding records of train delay, calculated by comparing actual train running against the timetable. It should be noted that this is not the timetable published twice-yearly to the travelling public, but that agreed by parties at 22:00 the day before the train is due to run. Thus the measure does not necessarily represent the full effect of delay and inconvenience caused to the public by asset failure. It does, however, incentivise Network Rail to work with TOCs to mitigate the effects of asset failure by agreeing and delivering real time services that will work, allowing reliable real time information and service updates to be communicated to the travelling public.
- 5.1.16 Train running data is normally received into TRUST automatically directly from the signalling system, although a few manual recording points remain. There are around 1300 delay recording points on the network, with delay being defined as the difference between the scheduled time and the actual time taken to pass between two Recording Points.
- 5.1.17 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. 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.
- 5.1.18 The data is managed and reported using a variety of 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.

- 5.1.19 Perhaps not surprisingly given the contractual matrix of the industry and in particular the financial penalties attached to train service performance failure, measures are well defined and data processes both well documented and implemented. 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 2007/08. 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).

Accuracy of reported data

- 5.1.20 As with last year's audit, this year's approach was "light touch", concentrating on key processes and data quality. During the course of the audit, it was confirmed to us that data quality assurance processes remain in place, as for 2006/07. A small sample of incidents was drawn from the system and a cross check carried out to verify the integrity of the base system data. All was found to be in order.
- 5.1.21 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. For example, each period, an audit between the incident list and reporting database is undertaken by the Headquarters Performance Data Team. 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. Incident data from PUMPS is also used for the Asset Failures measure. The use of performance incident data as a measure of asset failures is not without issues. For example, some bridge strikes incidents which historically were split contractually have in the past been recorded twice. There are also issues over the numbers of speed restriction incidents – if a TSR is in the system for 3 months, it is picked up as a separate incident each period.

Training and competence

- 5.1.22 The Headquarters Performance Data Quality Specialist chairs a monthly meeting which involves the data quality specialists from each route, plus representation from other departments as invited. Agenda items include data quality/delay attribution. Issues are referred to this forum from the performance Managers Measurement Meeting. Discussion items typically include change control procedures, updates to the Performance Measurement Manual, and any issues with delay attributions.

Assessment of confidence grade

- 5.1.23 **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.
- 5.1.24 **Accuracy grade.** We believe that Operational Performance should have an accuracy grade of 2.

Audit Statement

- 5.1.25 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2008 for Operational Performance. The data has been assessed as having a confidence grade of A2. Both regulatory targets for this measure: total delay minutes and Delay minutes per 100 train km have been met.

Recommendations arising

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

- 5.1.26 We have no recommendations for this measure.

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

5.1.27 We have no observations in relation to this measure.

Progress on outstanding recommendations from previous audit reports

5.1.28 We set out below our assessment on the current progress of Network Rail in addressing our outstanding recommendations for Operational Performance from our previous Audits:

Recommendations made	Progress update
<p>2007-R01: We have no doubt that the performance initiatives in hand arise in part from the high level of resource (especially people) being dedicated to this area. We recommend that the current resource base continue to be maintained with funding made available for systems improvements (subject to appropriate business cases being made).</p>	<p>Some minor changes have been made to the Headquarters team. Performance Measurement Managers have been introduced at route level. Route teams also include Data Quality Specialists and Dispute Resolution Managers.</p> <p>Current Status – Actioned and verified</p>

Figure 5.1.4 Progress on outstanding recommendations for Operational Performance

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 2008, Section 1, Customer and Supplier Satisfaction, including Tables 1.31 – 1.33.
- 5.2.2 These three measures report on the way in which Network Rail is regarded by some 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. The measure relies on research techniques, and in particular, consumer research techniques, to gather the data from which it is drawn. These 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.
- 5.2.4 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.
- 5.2.5 Network Rail measures satisfaction using multi-question opinion surveys. The surveys are carried out by an external company, 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.
- 5.2.6 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 (scores -2);
 - (b) I would be critical if someone asked my opinion (scores -1);
 - (c) I would be neutral if someone asked my opinion (scores 0);
 - (d) I would speak highly if someone asked my opinion (scores +1);
 - (e) I think so much that I would speak highly of them without being asked (scores +2).
- 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.

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".

Trends

- 5.2.10 Figure 5.2.1 illustrates the perception of Network Rail amongst their customers (Passenger and Freight Operating Companies) and suppliers over the last seven years.

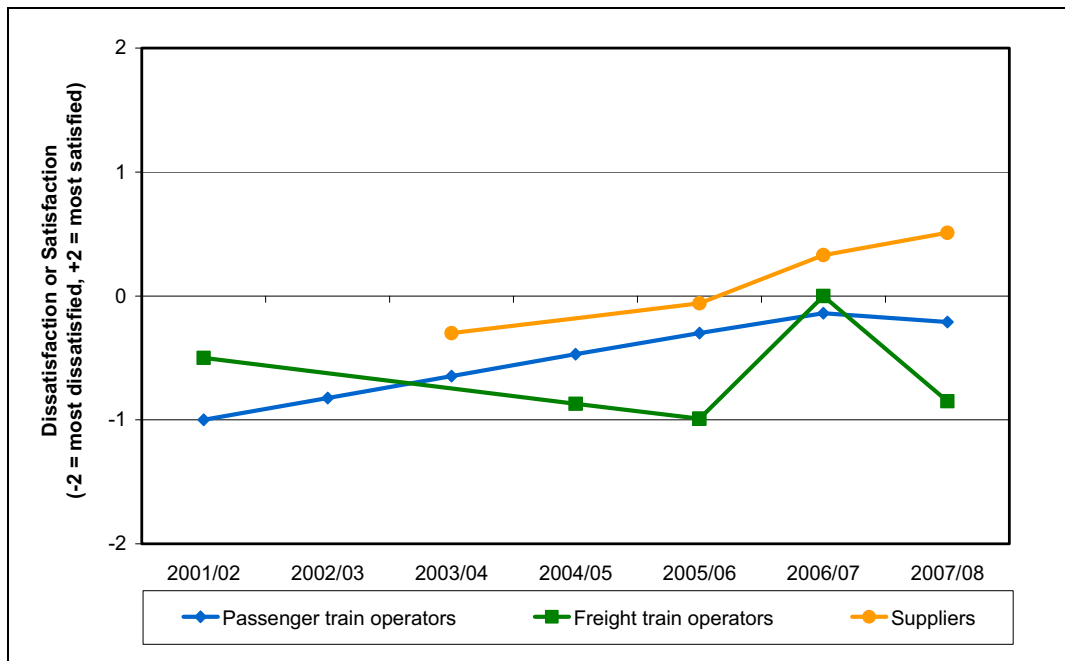


Figure 5.2.1 Customer & Supplier Satisfaction

- 5.2.11 **Passenger Train Operating Companies.** Disappointingly, Figure 5.2.1 shows a downturn in the perceptions of respondents. Moreover, it should be noted that the survey was conducted between mid October and late November, that is, before the well publicised period of poor performance by Network Rail over the Christmas period. It is difficult to interpret the reasons for the result. The customer survey is essentially a qualitative one, albeit it attempts to put numbers against different factors in order to give Network Rail guidance on where to target its management effort and resources. However, it should be borne in mind that this year’s result is only slightly lower (a variance of 0.07) than last year’s which was the best score achieved since the survey began.
- 5.2.12 **Freight Train Operating Companies.** Figure 5.2.1 illustrates the trend in the perception of Network Rail within Freight Companies. It should, however, be noted that the sample size for Freight customers is very small (under 30); it is not therefore unexpected that there should be a level of variability in the results.
- 5.2.13 **Suppliers.** Figure 5.2.1 appears to indicate that Network Rail is continuing to make steady progress in its relationships with its supply chain.

Audit Findings

Process

- 5.2.14 The two surveys, one of customers and one of 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 2007. 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 surveys under the same research manager. There is continuity between methodologies used in 2006 and 2007 and hence comparability between year on year results.

- 5.2.15 The 2007 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 can be included in the survey – this would be too large a sample to handle cost effectively. 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.
- 5.2.16 236 interviews were carried by telephone with TOC and FOC managers (against a maximum target of 240 – the 2006 survey achieved 244 interviews). The sample was representative of all operators, including open access ones. Interviews typically lasted between 20 and 25 minutes. This methodology was the same as for the 2006 survey and delivers both a high response rate and a higher level of detail compared to other alternative survey methods. It should be noted that the Customer survey was undertaken between 15 October and 30 November 2007, that is, before the highly publicised problems with overrunning engineering works at Christmas 2007.
- 5.2.17 For the supplier survey, the starting point for the sampling framework is Network Rail's list of suppliers. The sample is drawn from the list according to the volume of work undertaken. Whilst the key criterion is the amount of work done, enabling the research to focus on major suppliers, the sample is also adjusted to ensure that suppliers selected are critical to Network Rail's business.
- 5.2.18 72 interviews were conducted with CEOs and other senior managers and technical experts. Methodology was the same as for the 2006 survey, with in-depth interviews conducted face to face, or, where this wasn't possible, over the telephone. As in 2006, the survey was run as a joint initiative with the Rail Industry Association (RIA). This lends credibility to the study amongst respondents, as well as offering an additional level of check on the sampling methodology and impartiality of results.
- 5.2.19 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.
- 5.2.20 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

- 5.2.21 The methodology of both surveys has been established now over two years. The methodology represents an appropriate approach to this kind of work and the continuity allows for valid year on year comparisons in results. We are pleased to note that 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.

- 5.2.22 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. 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. 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, Network Rail are recognising the importance of customers and suppliers to their daily work and using feedback from them as the basis for improvement.

Organisational competencies

- 5.2.23 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

- 5.2.24 **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.
- 5.2.25 **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

- 5.2.26 We have audited the reliability and accuracy of data and commentary presented in Network Rail’s Annual Return 2008 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

- 5.2.27 **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 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.

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

- 5.2.28 We have no observations for this measure.

Progress on outstanding recommendations from previous audit reports

- 5.2.29 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>2007-R02: 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 2008 recommendations. <i>Current Status – Repeated in later year.</i></p>

Figure 5.2.2 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 2008, Section 1, Joint Performance Process (JPP), including Table 1.34.
- 5.3.2 The measure reports progress on the production of annual Joint Performance Improvement Plans (JPIPs) as part of the Joint Performance Process (JPP); this measure does not report on the content of JPIPs. The requirement to undertake a Joint Performance Process with Train Operating Companies (TOCs) and create the associated JPIPs was included in the Network Code (condition LA) on 27 March 2006; all franchised TOCs opted-in from that date.
- 5.3.3 The audit comprised meetings with Headquarters and local managers responsible for the production and maintenance of JPIPs. Three JPIPs for individual TOCs were sampled. The sample was not random but was representative of both service mix and size of activity. We held interviews with Route Performance teams responsible for Stagecoach South West Trains, London Midland and National Express East Coast.

Commentary on reported data

Regulatory Target

- 5.3.4 There is no regulatory target for this measure as part of the Annual Return.
- 5.3.5 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.
- 5.3.6 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

- 5.3.7 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. Individual JPIPs are produced for each TOC. The primary metric for measuring the success of JPIPs is the Public Performance Measure (PPM); delay minutes are secondary metrics.

- 5.3.8 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. Ultimately the success of the process relies on both parties working together. Our audit suggests that the success of this has varied across the company; in some cases it has been difficult to get TOCs to agree to the plans. In one case reviewed, the plan had not been signed by the TOC and was being referred to the Office of the Rail Regulator for resolution. However, we were particularly pleased that one of the audits was attended not just by the local Route Performance Manager, but also their counterpart from their partner TOC. It is notable that in this instance partnership working with Network Rail had formed a key part of the TOC's franchise bid – delivery of joint plans is easier when the objectives of both partners are aligned. This can be difficult where Routes have multiple TOCs; in this case it can be difficult to for Network Rail to align all the objectives all of the time.
- 5.3.9 The development of annual targets is led by the Headquarters Performance Improvement Manager; a standard templated approach is supplied to each Route. Disaggregated targets are issued to the Routes, with targets split out by geography and Train Operating Company.
- 5.3.10 It has been extremely heartening to see how over the three years since its introduction the JPIP process has moved from a compliance activity to a rolling process for delivering genuine and on-going improvement. Moreover, it is pleasing to see evidence this year that last year's recommendations with regards to the linking in of JPIPs to business planning are being implemented.
- 5.3.11 In terms of implementation, much work has been done at local levels by performance teams to involve front line managers and staff in both the on-going development and the delivery of the JPIP. This has included the development of KPIs for 2008/09 which encourages local functional managers to take responsibility for performance improvement and the implementation of JPIP actions.
- 5.3.12 Each Route audited had clear reporting and monitoring arrangements in place, including a clearly defined modus operandi for identifying and implementing remedial action.
- 5.3.13 This year our audits took place during the period of the FRA10 review, in which Network Rail was this year fully engaged. Several managers referenced the benefits of the process, and in particular, improvement actions that they had already identified as a result of preparing for that review. There were also several instances where best practice had been proactively sought out, developed and implemented locally in order to improve particular problem issues.

Skills and competence

- 5.3.14 Many of the skills required to run a successful JPP are “softer” skills, particularly relating to interpersonal skills and getting the best out of others. Managers we spoke to within Network Rail made spontaneous and positive mention of the high levels of investment in training within the organisation.

Assessment of confidence grade

- 5.3.15 **Reliability grade.** We believe that the audited measure should have a reliability score of A.
- 5.3.16 **Accuracy grade.** The data reported by Network Rail in the Annual Return is accurate – JPIPs are in place for audited Routes and are leading to significant reductions in delay minutes. We believe the accuracy grade for the JPIP measure as presented in the Annual Return is therefore 1.

Audit Statement

5.3.17 We have audited the reliability and accuracy of data and commentary presented in Network Rail’s Annual Return 2008 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

5.3.18 **JPP recommendation 1.** During the 2007/08 audits we witnessed a strengthened links between the JPIP process and infrastructure maintenance & renewal plans. We recommend that this link continue to be monitored, to ensure the anticipated improvements anticipated during CP4 do in fact materialise.

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

5.3.19 **JPP observation 1.** The success of Network Rail in delivering the JPP relies not just on its own efforts but also the willingness of Train Operating Companies to participate constructively in the process. This is particularly difficult where the objectives of companies are misaligned. This can happen where for example the performance targets of a particular franchise agreed between a TOC and the DfT are not in line with Network Rail’s own Route targets as outlined in its business plan, or where Network Rail is attempting to juggle the aspirations of a number of different operators with different service characteristics and different performance targets. The delivery of improvements has to be a joint process, with all parties equally committed to a common goal. Without stakeholder support in this, it can be difficult for Network Rail to deliver the outcomes that others desire.

Progress on outstanding recommendations from previous audit reports

5.3.20 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>2007-R03: We recommend the continued development of the challenge process for standard and stretch targets. We also recommend the continuing development of reporting such that forecasting accuracy can be monitored enabling Routes that may require support in this area to be identified.</p>	<p>Evidence provided to us during the audits concurs with Network Rail’s on this, namely that: “Challenge processes have been developed with more metrics in general and challenge being put in place for the 2008/09 JPIP agreement process.” Current Status – Actioned and verified</p>
<p>2007-R04: We recommend that the links between the JPIP process and infrastructure maintenance and renewal plans be formally strengthened. The JPIP has the potential to become a powerful tool for driving performance improvement, but is at risk of being seen as a bolt-on, rather than a process that could be influential in business planning.</p>	<p>There was clear evidence in the audits that links are now very much stronger than in previous years. This has been further strengthened during the CP4 process. We assess that this recommendation should continue to be monitored, to ensure the anticipated improvements anticipated during CP4 do in fact materialise. Current Status – Actioned and verified</p>

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

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 reported in Network Rail's Annual Return 2008, Section 2, Linespeed capability (C1), 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 at South East and London North Eastern Territories.

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	Variance
<35	5,570	4,163	3,821	3,787	3,783	-0.1%
40-75	16,585	16,927	16,895	16,856	16,890	0.2%
80-105	6,994	7,650	7,482	7,488	7,450	-0.5%
110-125	2,415	2,741	2,907	2,932	2,959	0.9%
125+	-	-	-	-	-	-
Total	31,564	31,482	31,105	31,063	31,082	0.1%

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%, comprising of 40.2km of new line and a net value of 3.2km of track removed due to data cleansing.

- 6.1.8 The Annual Return lists 71 linespeed changes:
- (a) 30 linespeed increases totalling 32.2km of track;
 - (b) 41 linespeed decreases totalling 17.7km of track.

Audit Findings

Process

- 6.1.9 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 Territory Engineering Knowledge Managers. GEOGIS is interrogated annually by Network Rail Headquarters to produce the data reported in the Annual Return.

Accuracy of the reported data

- 6.1.10 We undertook the following sampling activities:
- (a) Visits were made to 2 Territories, London North Eastern and South East. A sample of the linespeed changes during the year were checked against the relevant WONs and were found to have been accurately captured. However we observed that South East Territory had a far more robust system for recording linespeed changes from the WONs and PONs and updating them in GEOGIS. They had a spreadsheet which served as an audit trail of the changes made. It included information on the source document, when changes were made, and who made the changes in GEOGIS. The process followed in London North East was not as robust.
 - (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

- 6.1.11 **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 measure C1 should have a reliability grade of B.
- 6.1.12 **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 inconsistently applied across the Territories, which has the potential to lead to inaccuracies. We believe C1 should have an accuracy grade of 2.

Audit Statement

- 6.1.13 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2008 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 variation of 0.1% in the reported total track kilometres was almost entirely due to data cleansing. 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

- 6.1.14 **C1 recommendation 1.** 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.
- 6.1.15 **C1 recommendation 2.** 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. It is recognised however that after the organisational changes that have recently happened in the Engineering Knowledge team, Network Rail intend to set up more uniform systems to report this measure.

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

- 6.1.16 We have no observations for this measure.

Progress on outstanding recommendations from previous audit reports

- 6.1.17 There are no outstanding recommendations for this measure.

6.2 Gauge capability (C2)

Audit scope

- 6.2.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2008, Section 2, 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 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 the reported net change in the total kilometres of route, compared with last year is an increase of 0.2 %.

Gauge	2003/04	2004/05	2005/06	2006/07	2007/08	Variance
W6	5,223	4,955	4,771	4,746	4,669	-1.6%
W6 & W7	2,284	2,794	2,741	2,720	2,829	4.0%
W8	6,340	5,648	5,504	5,496	5,408	-1.6%
W9	2,483	1,714	1,615	1,618	1,698	4.9%
W10 & W6	-	6	6	6	6	0.0%
W10 & W8	-	60	73	65	65	0.0%
W10 & W9	163	939	1,100	1,138	1,139	0.1%
Total	16,493	16,116	15,810	15,789	15,814	0.2%

Figure 6.2.1 Gauge capability (kilometres) (C2)

- 6.2.8 These 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.

Audit Findings

Process

- 6.2.9 The process of reporting the network capability measures has not changed from the 2006/07 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 Track Geometry and Gauging Engineer using Certificates of Gauging Authority. The National Engineering Reporting team uses a lookup query to identify the total track length for each gauge type from GEOGIS.
- 6.2.10 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 are 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.
- 6.2.11 We obtained a sample historical Certificates of Gauging Authority as well as a sample of Certificates of Gauging Authority issued during 2007/08.

Accuracy of the reported data

- 6.2.12 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 2007/08. 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. It must however be noted that for some of them the gauge in the Certificate was recorded as W10, while the database recorded the gauge as W9 & W10. Network Rail stated that the Certificate allowed "tall" W10 freight vehicles to run but this did not reflect the fact that the route already had W9 status which is "wider". Hence it was reported as W9 & W10.
 - (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.
 - (d) Our C1 audit found GEOGIS has been subject to data cleansing, contributing towards a reduction in total track kilometres for some gauges.

Assessment of confidence grade

- 6.2.13 **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.
- 6.2.14 **Accuracy grade.** Our sampling found no errors in changes to gauge made in 2007/08, or to a sample of ELRs. We were unable to verify the impact of data cleansing on gauge capability. We believe that measure C2 should have an accuracy grade of 2.

Audit Statement

- 6.2.15 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2008 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

- 6.2.16 **C2 recommendation 1.** We recommend that Network Rail undertakes a thorough data cleaning exercise of the Capabilities Database to ensure that it accurately reflects the published gauge capability.

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

- 6.2.17 We have no observations for this measure.

Progress on outstanding recommendations from previous audit reports

- 6.2.18 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:

Recommendations made	Progress update
<p>2007-R09: 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. Current Status – Repeated in Later year</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 reported in Network Rail's Annual Return 2008, Section 2, Route availability value (C3), including Tables 2.7 – 2.8.
- 6.3.2 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: RA 1-6, RA 7-9, RA 10.
- 6.3.3 The definition and procedures for this measure are documented in NR/ARM/C3DF (issue 5) and NR/ARM/C3PR (issue 5).
- 6.3.4 The audit was undertaken at Network Rail Headquarters.

Commentary on reported data

Regulatory target

- 6.3.5 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.
- 6.3.6 In April 2001 the network consisted of 2,725km of track in RA band 1-6, 14,729km in RA band 7-9, and 13,392km in RA band 10.

Trend

- 6.3.7 Figure 6.3.1 shows the reported net change in the total kilometres of track for three RA bands. Track in RA1-6 has increased by 73.8%; track in RA7-9 and RA10 have shown a reduction.

RA Band	2003/04	2004/05	2005/06	2006/07	2007/08	Variance
RA 1-6	2,375	2,529	2,309	2,296	3,991	73.8%
RA 7-9	26,297	26,319	25,935	25,928	25,060	-3.3%
RA 10	2,585	2,634	2,861	2,839	2,031	-28.5%
Total	31,257	31,482	31,105	31,063	31,082	0.1%

Figure 6.3.1 Structures route availability (C3)

- 6.3.8 These large variances between RA bands are a result of the RA Verification project recently completed by Network Rail. London North Eastern, South East and Scotland have had the greatest changes in route length between the RA bands.

Audit Findings

Process

- 6.3.9 The process of reporting the network capability measures has not changed from the 2006/07 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

- 6.3.10 We undertook the following sampling activities:
- (a) For a sample of the routes (ELRs), the 'verified RA' was checked against the values in the Capabilities Database. The RA values were found to be correctly recorded in the Capabilities Database and 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

- 6.3.11 **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 C3 should have a reliability grade of B.
- 6.3.12 **Accuracy grade.** Our sampling found no errors. We were unable to verify the impact of data cleansing on route availability; however, our C1 audit found the net variation due to cleansing on the total network kilometres was 0.1%. We believe that measure C3 should have an accuracy grade of 2.

Audit Statement

- 6.3.13 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2008 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

- 6.3.14 We have no recommendations for this measure.

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

- 6.3.15 We have no observations for this measure.

Progress on outstanding recommendations from previous audit reports

- 6.3.16 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 reported in Network Rail's Annual Return 2008, 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.

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. 3rd 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	2003/04	2004/05	2005/06	2006/07	2007/08	Variance
25 kV a.c. overhead	7,780	7,748	7,882	7,980	7,974	-0.1%
650/750 V d.c. 3rd rail	4,483	4,497	4,493	4,484	4,481	-0.1%
Dual a.c. OHL & d.c. 3rd rail	33	35	39	38	40	4.5%
1500V d.c. overhead	19	39	39	39	39	-0.8%
Electrified	12,315	12,319	12,453	12,541	12,534	-0.1%

Figure 6.4.1 Electrification capability (C4)

- 6.4.8 These variances have been caused by either:
- Data cleansing activity;
 - There were 7km of additions of electrified track in 2007/08;
 - Closure of lines.

Audit Findings

Process

- 6.4.9 The process of reporting the network capability measures has not changed from the 2006/07 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.

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 2007/08 were selected and it was found that they were nearly all correctly reflected in GEOGIS. Network Rail however pointed out that for one ELR (ECM8), 2km of electrified track was coded as non-electrified. The relevant Territory engineers had been asked to change the GEOGIS records but had failed to do so even on the date of the audit.

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.** One minor error was found, where one ELR was wrongly reported, and the GEOGIS records had not yet been updated. 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 2008 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 **C4 recommendation 1.** 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.

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

6.4.15 We have no observations for this measure.

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:

Recommendations made	Progress update
<p>2006-R14: We recommend that the GEOGIS database be checked to ensure that electrification classifications are correctly recorded.</p>	<p>Audit of the last two years have shown no more significant errors in classifications Current Status – Actioned & Verified</p>

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 reported in Network Rail's Annual Return 2008, 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 0.7% between 2006/07 and 2007/08, whilst the freight miles decreased by 7.1% during the same period.

Measure	2003/04	2004/05	2005/06	2006/07	2007/08	Variance
Passenger train mileage (franchised)	263.6	262.9	267.8	268.8	270.8	0.7%
Passenger train mileage (open access)	3.9	3.5	4.1	4.1	4.2	2.8%
Freight train mileage	29.3	27.9	31.0	29.9	27.8	-7.1%
Total Mileage	296.8	294.3	302.9	302.8	302.8	0%

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 .txs 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 .txs files into Excel format. A summary spreadsheet summarises the train miles data by operator on a period-by-period basis.

Freight Miles

- 6.5.9 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).
- 6.5.10 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.

Accuracy of reported data

Passenger Miles

- 6.5.11 The query used to extract the data from PALADIN was checked and found to be reasonable. The summary spreadsheet used to compile the data was also checked and found to be accurate.
- 6.5.12 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.
- 6.5.13 During 2007/08 there were certain changes that occurred in the franchise structure, with TOCs being merged or reorganised. 4 operators ceased to exist – Midland Mainline, Central Trains, Virgin CC, and Silverlink. These were replaced by 4 new operators – Arriva CC, East Midland, London Midlands, and London Overground. Further GNER was changed to National Express East Coast. We checked and confirmed that the data reported accurately reflected these changes.
- 6.5.14 Train miles for Chiltern Railways services running on LUL infrastructure have not been excluded from the train miles reported in the Annual Return. The reported data is therefore overstated by a small (unquantified) amount.

Freight Miles

- 6.5.15 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.
- 6.5.16 While auditing passenger miles, the Performance Reporting Analyst extracted freight train miles from the Performance Strategy System (PPS) for a sample of operators for 2007/08. We however found there were significant differences between these figures and those reported by the Freight Billing Team (which we audited). These differences varied between 12% to -15%.
- 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 reasonable 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 reasonable 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 found that extracting the data from BIFS and PPS gave rise to two different sets of train miles. We believe that Freight Miles should have an accuracy grade of 3.

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 2008 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 2008 for Mileage. Our audit found significant differences between the reported data and another standard source of industry data. 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

- 6.5.24 **Mileage recommendation 1.** We recommend that Chiltern Railways running on LUL infrastructure is excluded from the figure reported.
- 6.5.25 **Mileage recommendation 2.** We recommend that Network Rail analyses the significant differences between data extracted from BIFS and PPS.

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

- 6.5.26 We have no observations for this measure.

Progress on outstanding recommendations from previous audit reports

- 6.5.27 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
2007-R10: We recommend that Chiltern Railways running on LUL infrastructure be excluded from the figure reported.	No action has been suggested to date. Current Status – Repeated in later year
2007-R11: We recommend that Network Rail rationalises the significant differences between data extracted from BIFS by the Performance Reporting Analyst and the Freight Billing Team.	No action taken to date Current Status – No Action or Timescale Identified
2007-R12: We recommend Network Rail rationalises the significant differences between the BIFS and PALADIN train mileages.	Not an issue during the 2007/08 audit Current Status – Withdrawn by Reporter
2007-R13: We recommend that a Network Rail adopt a formal procedure for reporting this measure.	No action taken to date Current Status – No action or Timescale Identified

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 reported in Network Rail's Annual Return 2008, 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 5.3% between 2006/07 and 2007/08.

Measure	2003/04	2004/05	2005/06	2006/07	2007/08	Variance
Million Gross Tonne Miles	27.235	28.392	30.305	30.252	28,650	-5.3%%

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.

Accuracy of reported data

- 6.6.9 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.
- 6.6.10 The data reported is a sum of the period-by-period train miles extracted from BIFS.

Assessment of confidence grade

- 6.6.11 **Reliability grade.** The definition and procedure for this measure is not documented. A reasonable 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.

6.6.12 **Accuracy grade.** We believe Freight Gross Train Miles should have an accuracy grade of 2.

Audit Statement

6.6.13 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2008 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

6.6.14 **Freight GTM recommendation 1.** We recommend that a formal definition and procedure is documented for this procedure and included in the Asset Reporting Manual.

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

6.6.15 We have no observations for this measure.

Progress on outstanding recommendations from previous audit reports

6.6.16 There are no outstanding recommendations for this measure.

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 2008, Section 2, Management of Late Disruptive Possessions.
- 6.7.2 The measure reports on the number of Late Disruptive Possessions (defined as any restriction on the availability of the network, which requires a TOC/FOC to bid for a short term, planned alteration to a weekly timetable service or existing offered STP service) that Network Rail has taken over the year.
- 6.7.3 This is the first time that this measure has been reported in the Annual Return. For this year, Network Rail have produced a purely numeric measure, taken by counting the number of Late Disruptive Possessions taken for each Territory.
- 6.7.4 Audits were undertaken at Leeds, where the measure is calculated by the Acting Possession Systems Support Specialist.

Commentary on reported data

Regulatory target

- 6.7.5 There is no regulatory target for this measure

Trends

- 6.7.6 Although this is the first year in which this measure has been reported, Network Rail has produced two years' worth of data to enable a limited trend comparison to be made. This shows that overall the number of possessions fell from 5,529 in 2006/07 to 4,444 in 2007/08.
- 6.7.7 Figure 6.7.1 illustrates how each part of Network Rail appears to have made progress in reducing the number of possessions year on year, with the exception of South East, which has seen a very small increase.

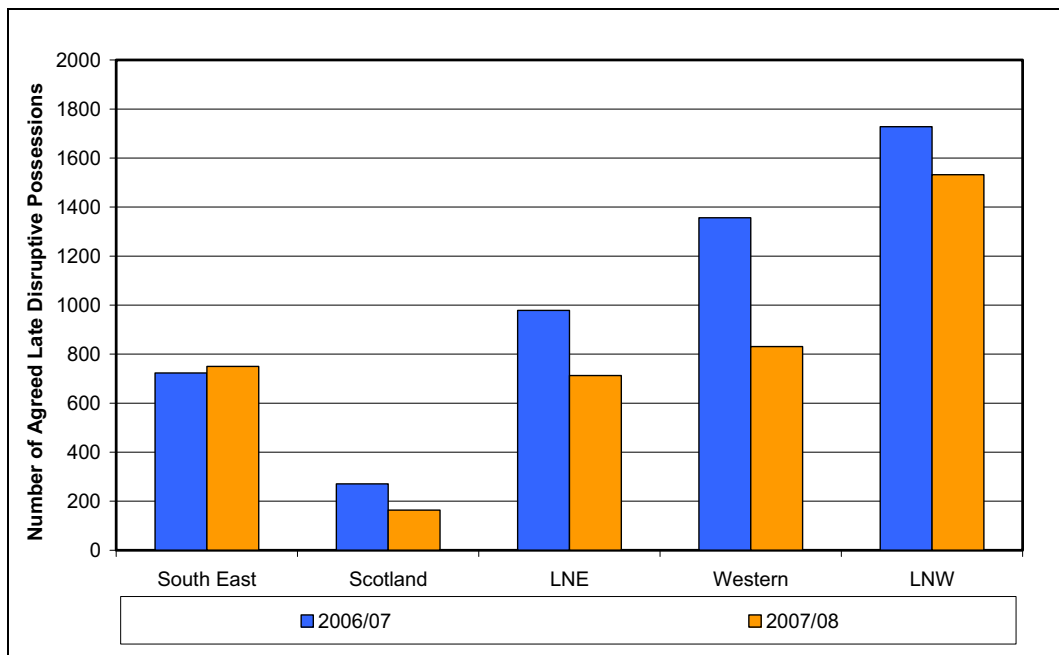
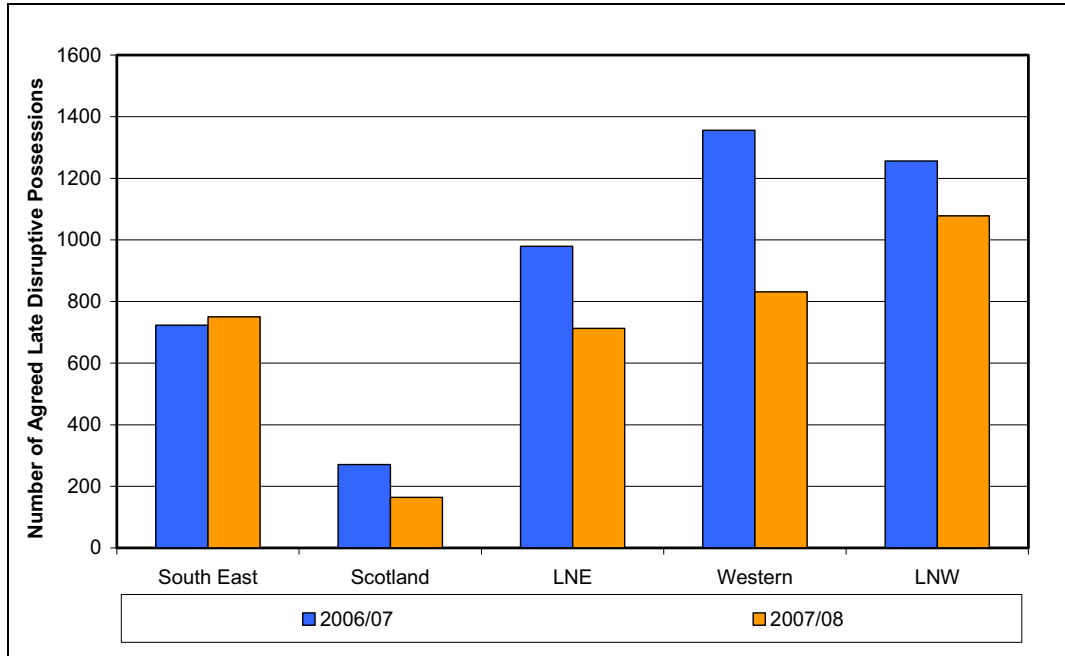


Figure 6.7.1 Late Disruptive Possessions by Territory including WCRM

6.7.8 Around one third of the Late Notice Possessions for London North Western Territory are associated with the West Coast Route Modernisation. Figure 6.7.2 below illustrates performance if possessions associated with the West Coast Route Modernisation (WCRM) are netted off the performance of London North Western Territory.



6.7.9

Figure 6.7.2 Late Disruptive Possessions by Territory excluding WCRM

6.7.10 It should, however, be noted that Network Rail themselves have concern about the level of robustness within the data used to compile the measure, particularly in relation to the historical data for 2006/07, a concern we would share. For this year, we question how much weight can be put on the results.

Audit findings

Process

6.7.11 The data source for this measure is the Possessions Planning System, with origin data being entered by Area Delivery Planning Teams. Data is extracted from the system on a four-weekly basis and is integral to the Schedule 4 system, affecting the level of compensation paid to the TOCs.

Accuracy of Reported Data

6.7.12 Network Rail have themselves warned that the level of robustness behind the measure this year is not as secure as they would have hoped. In particular, by having to re-create the measure retrospectively, they have had to use data that was available, rather than the data that they would have specified for capture had a reporting process for the measure be in place at the start of 2006/07.

6.7.13 They have assured us that significant steps have been taken to improve reporting for next year.

Assessment of confidence grade

6.7.14 **Reliability grade.** We believe that the Management of Late Disruptive Possessions should have a reliability grade of B.

6.7.15 **Accuracy grade.** We believe that the Management of Late Disruptive Possessions should have an accuracy grade of 3.

Audit Statement

- 6.7.16 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2008 for the Management of Late Disruptive Possessions. We welcome Network Rail's openness in terms of sharing their doubts in terms of the robustness of the measure this year. We note that this is the first year that the measure has been reported, and to some extent, this has been a learning process for all parties. 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

- 6.7.17 **Management of Late Disruptive Possessions recommendation 1.** The measure is this year very much "work in progress". For next year we will expect to see the level of reliability in the measure much improved. In particular, we will expect to see a) evidence of a clearly documented procedure in place with regard both to source data collection and the undertaking of data analysis/reporting to report on the measure and b) a clear and comprehensive data trail.
- 6.7.18 **Management of Late Disruptive Possessions recommendation 2.** For this year, the measure is a simple numeric one – as such, it has some usefulness in determining Network Rail's measurement of its asset base. However, we recommend that for the future that Network Rail consider increasing the sophistication of this measure, for example, by considering the impact of possessions, factoring in such issues as the length of the notice period and the number of trains plans amended.

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

- 6.7.19 We have no observations for this measure.

Progress on outstanding recommendations from previous audit reports

- 6.7.20 There are no outstanding recommendations for this measure.

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 2008, 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 each Territory.

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 2005/06 to 2008/09 should be no greater than 300 per annum.
- 7.1.6 181 broken rails were reported for 2007/08 which would meet the target of 300.

Trends

- 7.1.7 Figure 7.1.1 below shows the number of rail breaks for 2007/08 has continued the downward trend of this measure since 2000/01. The result for 2007/08 is a 5.7% improvement on 2006/07. The reasons for the lower result in 2007/08 have been attributed to a combination of improving testing processes which are reaping benefits by catching defects before they break plus the grinding programme and mild winter.

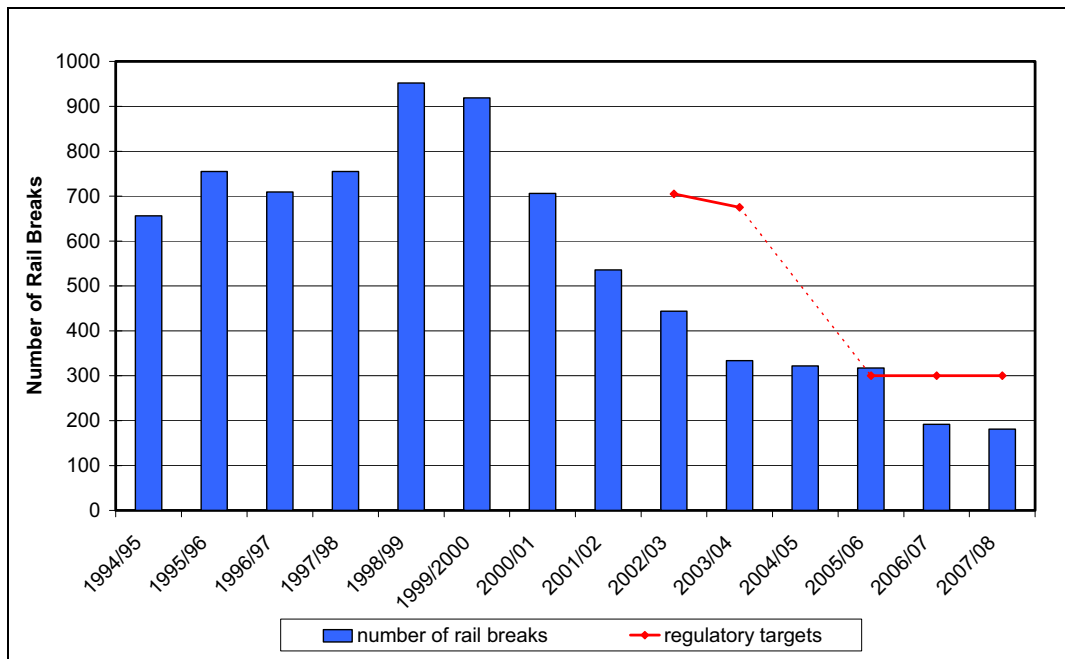


Figure 7.1.1 Number of broken rails (M1)

7.1.8 The number of broken rails by Territory is shown in Figure 7.1.2 below. The Territories with the largest decreases of Rail Breaks in 2007/08 were London North Western and Scotland. London North Eastern and South East Territories showed increases in the number of Rail Breaks in 2007/08.

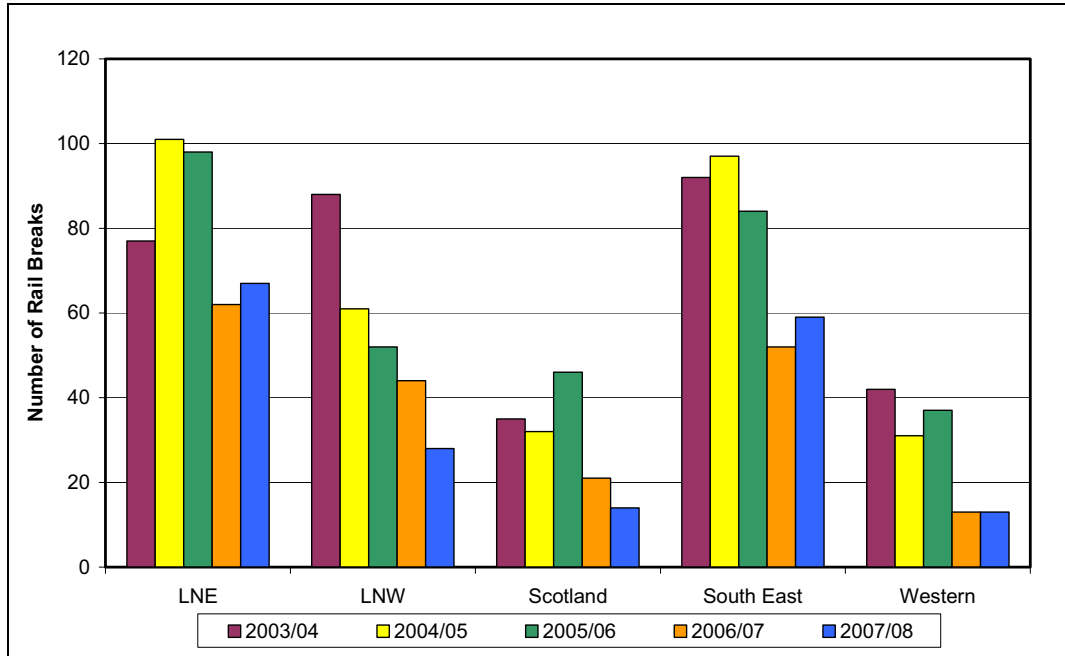


Figure 7.1.2 Number of broken rails by Territory (M1)

7.1.9 Engineers in the Territories audited attributed the decrease in the number of rail breaks to the mild winter, improved Ultrasonic Test Unit (UTU) compliance on the network, and the ongoing effect of renewals.

7.1.10 The percentage of weld failures and rail foot corrosion breaks have increased, but this is over a smaller sample than before and is therefore not a significant rise. Defects in the rail head have been 'hugely reduced', mainly due to the Ultrasonic Testing Unit (UTU) being run compliantly on most CAT1A, 1, 2 and 3 lines. The grinding programmes within the Territories have helped reduce rail breaks in main line routes, especially squat type defects.

7.1.11 As stated above, the temperate weather has also been a contributing factor in reducing numbers, although a small number of breaks still occurred during the traditional cold snap in November. Therefore there are always a proportion of broken rails that is sensitive to the climate and will be subject to the impact of the rail temperature dropping to sub-zero during the autumn and beyond. However, with improved testing and inspection, the impact of the 'cold snap' effect is expected to reduce.

7.1.12 For comparative purposes we have normalised the number of rail breaks using Equated Track Miles (ETM). Figure 7.1.3 shows the number of broken rails per 1000 ETM for each Area as coloured bars and a Network average for 2007/08 as a black bar. The grey bars show the same results for 2006/07, for comparative purposes.

7.1.13 It is apparent that Wessex, Anglia, Great Northern and East Midlands are significantly above the network average for breaks per 1000 ETM, which has forced London North Eastern and South East Territories above the network average. These Areas have significant volumes of freight traffic travelling to and from the Southern and Eastern Sea Ports. Network Rail's engineers consider this to be an important factor with heavy axle loads causing high impact forces where there are surface irregularities on the contact patch of the rail head.

7.1.14 There have been significant improvements on Wales & Marches, Sussex, Scotland East, West Coast South, Lancs. and Cumbria, Central and North Eastern. London North Western, Scotland and Western Territory all have fewer breaks per 1000 ETM than the network average.

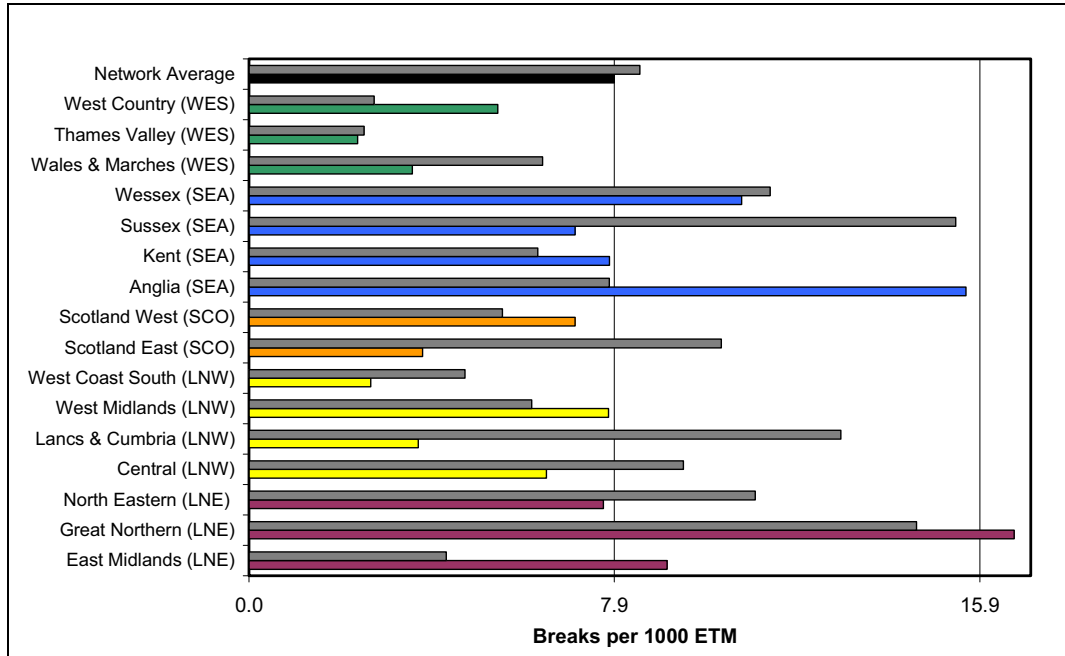


Figure 7.1.3 Rail breaks per 1000 equated track miles (M1)

Audit findings

Process

- 7.1.15 When broken rails are identified on the network, they are recorded at an Area level using a broken rail incident form. The details of each rail break are entered into the Area Defect Database and in many Areas also entered into a parallel running spreadsheet. Most Areas are still using databases developed by the former IMC's (Infrastructure Maintenance Companies), but Lancashire and Cumbria, Wessex and West Country Areas have all adopted the Rail Defect Tracker (RDT) system which was introduced and later withdrawn in 2007/08.
- 7.1.16 Following Network Rail's decision to shelve RDT as the preferred network-wide system, a new system, Rail Defects Management System (RDMS), is due to be rolled out in 2008/09, with an expected implementation date by 30th October 2008. The introduction is to generally coincide with the re-structuring within Network Rail to a route based organisation.
- 7.1.17 Rail break data from the Area rail defect databases is co-ordinated by the National Reporting Team to provide data to report the network-wide number of broken rails. In parallel, details of broken rails reported in the daily national control log are also recorded by the National Reporting Team in a 'Broken Rail Information' spreadsheet. RailData is also being used to record broken rails by the Network Rail Territories, however this will be replaced when RDMS becomes operational.
- 7.1.18 At Territory level, broken rails are being managed through the Hazard reporting system. Along with other incidents that feature on the daily national log, broken rails are awarded a hazard rating according to the severity of the break, apparent risk level of the location and the importance of the route. This system is used as a back-check by the Territory rail management engineer to review broken rails reported by the Areas/ Depots.

- 7.1.19 Every four weeks, the National Engineering Reporting Manager instigates a check by Territory Rail Management Engineers to reconcile the data in the Broken Rail Information spreadsheet and the data in the Area Defect Databases and to formally confirm the number of breaks.
- 7.1.20 Once any discrepancies between the Broken Rail Information Spreadsheet and the data in the Area defect databases are resolved, the National Engineering Reporting Manager stores the details of each rail break in the Headquarters RailFail database.
- 7.1.21 The Headquarters RailFail database is used to generate four weekly Period KPI Reports and the data at year end for the Annual Report.
- 7.1.22 Network Rail is anticipating that with the roll-out of RDMS, improvements in trend analysis will be available, which will allow the classifications and locations of rail breaks can to identified.

Assessment of confidence grade

- 7.1.23 **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.
- 7.1.24 **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 two broken rails or more in 2007/08 to have an inaccuracy of 1% of 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

- 7.1.25 We have audited the data presented in the Annual Return 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

- 7.1.26 We have no recommendations for this measure.

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

- 7.1.27 We have no observations for this measure.

Progress on outstanding recommendations from previous audit reports

- 7.1.28 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:

Recommendations made	Progress update
<p>2005-R11: 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. Current Status – In Progress</p>

Recommendations made	Progress update
<p>2007-R14: 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. Current Status – In Progress</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 2008, 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 a sample Area in each Territory: Great Northern Area for London North Eastern, West Coast South Area for London North Western, Scotland West Area for Scotland, Anglia Area for South East and West Country Area for Western.

Commentary on reported data

Regulatory target

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

Trend

- 7.2.6 In 2007/08, the number of isolated defects found was 22,851, which is 6.2% more defects than found in 2006/07; the length of continuous rail defects found was 339,973 yards, a decrease of 24.6% yards of defects than found in 2006/07. Isolated defects have increased mainly due to the increased UTU testing, while continuous defects (particularly Rolling Contact Fatigue defects) have reduced due to 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 2007/08 is (as yet) uncorrected.
- 7.2.8 **Isolated Rail Defects.** Figure 7.2.1 shows the number of isolated defects reported in the Annual Return. The performance for 2007/08 shows 50.0% fewer defects than the initially reported figure for 2006/07 and 20.1% fewer defects than the subsequently restated figure for 2006/07.
- 7.2.9 **Continuous Rail Defects.** Figure 7.2.2 shows the length of continuous defects reported in the Annual Return. The performance for 2007/08 shows an 8.6% decrease in defects than the initially reported figure for 2006/07 and 3.0% more defects than the subsequently restated figure.

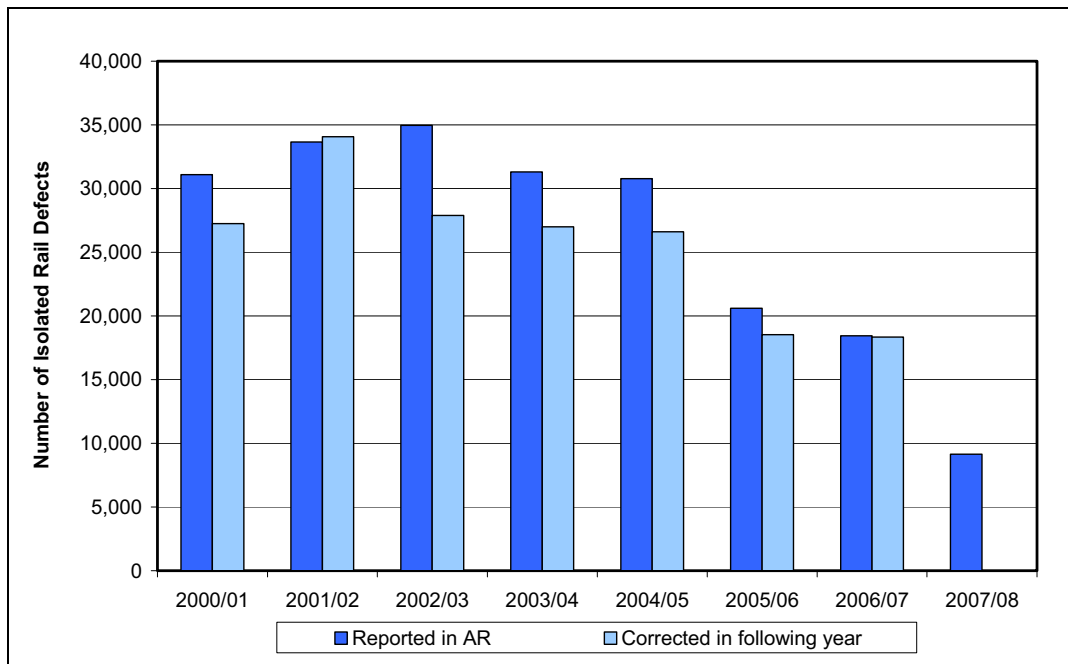


Figure 7.2.1 Numbers of isolated rail defects (M2)

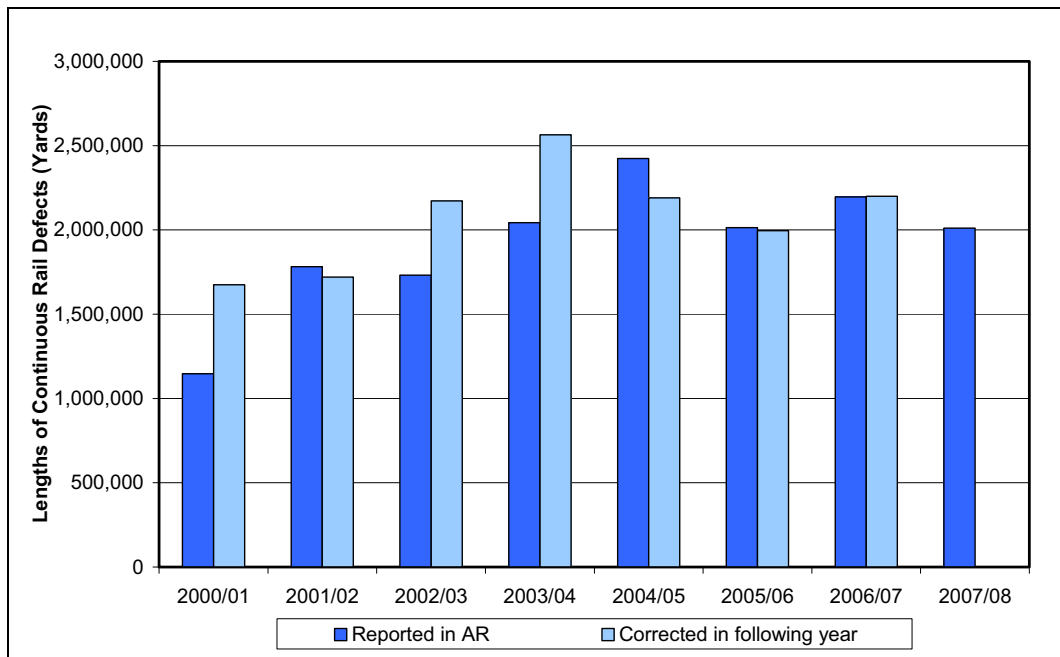


Figure 7.2.2 Length of continuous rail defects (M2)

Audit Findings

Area process

7.2.10 Data is collected for this measure through ultrasonic non-destructive and visual inspections. When a defect is identified it is recorded on a standard inspection form. These are then entered into the legacy Area Defect Databases by personnel in the Depots or at Area office level.

-
- 7.2.11 Network Rail are using the Ultrasonic Test Units (UTU) to replace pedestrian testing for the compliant testing requirements on the main line routes (CAT1A, 1, 2 and 3) at the standard testing frequencies. Additional pedestrian testing is then used to validate defects reported from UTU runs and to target defects – such as wheelburns, vertical longitudinal splits, lipping – outside of the UTU field of testing.
- 7.2.12 Details of isolated and non-RCF (Rolling Contact Fatigue) continuous defects are entered into the legacy Area Defect Database. The Areas use these databases throughout the process of defect management from identification to remediation. Each system was developed separately, and so each one has different built-in functionality for asset management; however, all the systems inspected provided reports for the ages of defects and the defects overdue for remediation.
- 7.2.13 RCF continuous defects found on site are entered into a variety of Area RCF tracking systems. Every 4 weeks the Areas forward this RCF data to the National Engineering Reporting Team as part of the reporting process.
- 7.2.14 RDMS (Rail Defects Management System) is due to be rolled out between June and October 2008. This will mean that there is a single database used by all Territories to record all defective rails, including RCF defects. Network Rail have said that RDMS will make it difficult for defects or sites of continuous defects to be entered more than once, and works together with ELLIPSE to provide a work bank and check off defects removed.
- 7.2.15 RDMS will also replace RailData, which is the former British Rail system retained by Railtrack and Network Rail throughout the period following privatisation. It had been retained as the client's system in parallel to the Infrastructure Maintenance Contractors systems and is still in use today.
- 7.2.16 The introduction of RDMS also coincides generally with Network Rail's re-structuring to a Route based organisation. This has an effect on the management of data input from ultrasonic and inspection teams into the new system. This is currently done at Area level in some locations and at Depot level in other places. The new organisation will result in the Area level of input being devolved down to the Depots in many places. Inevitably new personnel will be needed for the input in some Depots.
- 7.2.17 To prepare for the roll out of RDMS, the Areas have been continuing to undertake a data-cleansing exercise to ensure that the data entered into the new system is as accurate as possible. The data cleansing exercise was also necessary for the introduction of Rail Defect Tracker (RDT) in the previous year, before its network-wide introduction was withdrawn as the preferred system. Therefore corrections to databases have been ongoing and it has been necessary to continue this process in the 2007/08 year.
- 7.2.18 Some Areas who switched from their legacy systems to RDT early in the process found it necessary to retain RDT as their preferred system until the introduction of RDMS. However, these Areas in particular had to make significant updates at year end where rail defects had been removed from the track but this was not reflected in the RDT system. This resulted in some large data corrections at the end of 2006/07 and 2007/08.

Accuracy and Reliability of sampled data

- 7.2.19 We compared a sample of six defect report forms from the sample Areas with the data entered onto their database. In all of the sample Areas, the defect forms were completed in accordance with the procedure and had been entered correctly into the databases.
- 7.2.20 The Area Defect Databases are an integral part of the defect management process; engineers in each sample Area were confident regarding the accuracy of the defect data within their database and our sample audit concurred with this assertion.
- 7.2.21 However, the reliability of the data when comparing sampled Areas was inconsistent as some Areas included non-actionable defects in their databases and other Areas only included actionable defects (with the non-actionable defects being recorded in other asset management systems).

Assessment of confidence grade

- 7.2.22 **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 2007/08. Our audits have revealed that there is still an inconsistency around the network regarding non-actionable defects (some Areas are excluding them while others are not). Therefore, we believe that M2 should continue with a reliability grade of B.
- 7.2.23 **Accuracy grade.** We have concerns regarding the level of data correction required at the start of the 2007/08 reporting year. However, we have also noted that during the 2007/08 year all Areas have made good progress to improve the accuracy of the data in their systems despite significant data corrections in some Areas at the start of the year. However, until the rail defect data has been transferred into the new RDMS system and all Areas can demonstrate that data corrections are at a marginal level, we believe that M2 should continue with an accuracy grade of 3.

Audit Statement

- 7.2.24 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2008 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

- 7.2.25 **M2 recommendation 1.** For the fourth year in succession we still 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).
- 7.2.26 **M2 recommendation 2.** 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 & Severe category is reported separately in order to make visible the removal of Heavy & Severe RCF defects. This would enable the benefit of the rail grinding and re-railing work to be assessed.

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

- 7.2.27 **M2 observation 1.** We recognise the progress being made on the initiative to apply the Ultrasonic Test Unit (UTU) testing to lines which are Track Category 1A, 1, 2 and 3 and the aim to comply with the mandatory testing requirements using the UTU instead of pedestrian ultrasonic testing, where practicable. As part of this process Network Rail have a wish to separate suspect defects from actionable defects in order to manage the data. We recognise that the testing process, as it improves, will most likely increase the overall volume of defects found, particularly if more defects are being discovered which were previously not picked up. Therefore we support and endorse the initiative to separate suspect defects from actionable defects so that in the future, trend analysis will be more reliable.

Progress on outstanding recommendations from previous audit reports

- 7.2.28 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>2007-R15: 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.</p> <p>Current Status – Repeated in later year</p>
<p>2007-R16: 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 & Severe category is reported separately in order to make visible the removal of Heavy & 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.</p> <p>Current Status – Repeated in later year</p>

Figure 7.2.3 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 2008, 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 four track geometry parameters together with the percentage of track defined as 'very poor' or 'super-red'.
 - Speed band data (M3), including Tables 3.13 – 3.15. This is distribution of standard deviation values by national speed bands for different track geometry bands.
 - Level 2 exceedences (M5), including Table 3.19. 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 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

- 7.3.4 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 below the baseline level recorded in 2003/04.

National standard deviation data (M3)

- 7.3.5 The track geometry results for the 2007/08 reporting year are presented in Figure 7.3.1.

Geometry parameter	35m Top (Vertical displacement)			35m Alignment (Horizontal displacement)			70m Top (Vertical displacement)			70m Alignment (Horizontal displacement)		
	50%	90%	100%	50%	90%	100%	50%	90%	100%	50%	90%	100%
Results for 2007/08	73.6%	93.8%	98.6%	82.1%	95.8%	97.9%	74.7%	95.5%	97.3%	87.9%	98.1%	98.7%
Regulatory target	62.3%	89.2%	97.0%	72.6%	92.9%	96.5%	63.4%	92.3%	95.3%	79.2%	95.7%	97.2%
Result against target	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Figure 7.3.1 National SD data (M3)

- 7.3.6 All twelve of the regulatory targets for M3 track geometry national standard deviation data would be met in 2007/08.

Poor track geometry (M3)

7.3.7 There are no regulatory targets for poor track geometry.

Speed band data (M3)

7.3.8 There are no regulatory targets for speed band measures.

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 0.59 L2 exceedences per track mile were reported for 2007/08, which would meet the target.

Trends

7.3.11 The Annual Return commentary attributes the 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 2007/08 for all twelve measures are at the highest level of track geometry level since 2000/01.

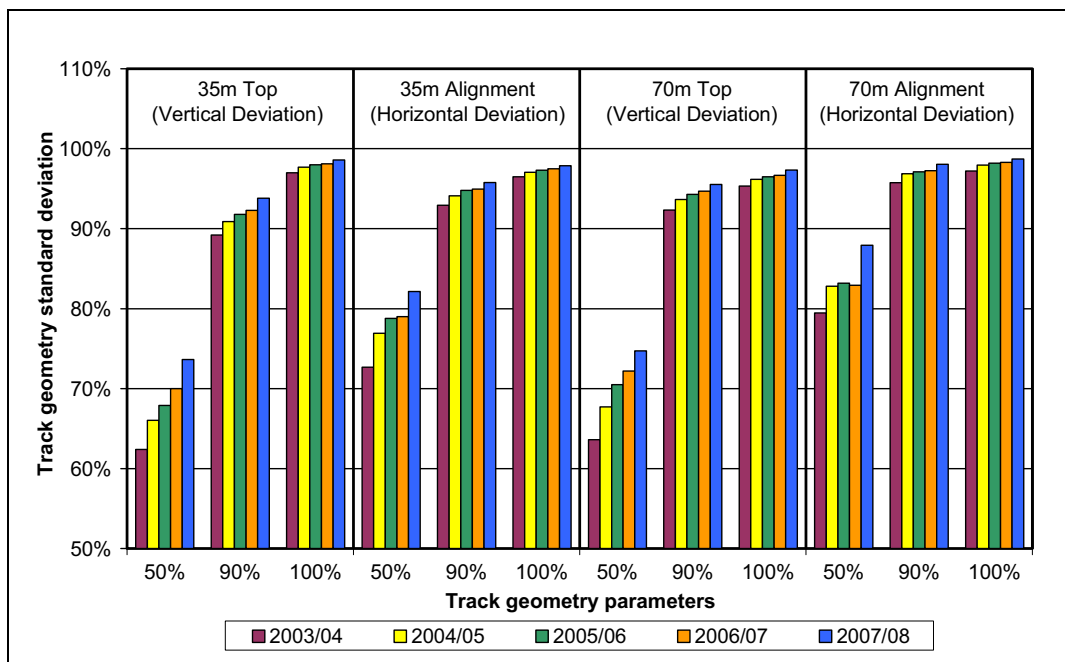


Figure 7.3.2 Track geometry standard deviation 2003/04 – 2007/08 (M3)

Poor track geometry

7.3.13 The poor track geometry (PTG) index is calculated using the national SD data results for each of the four track quality parameters together with 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.

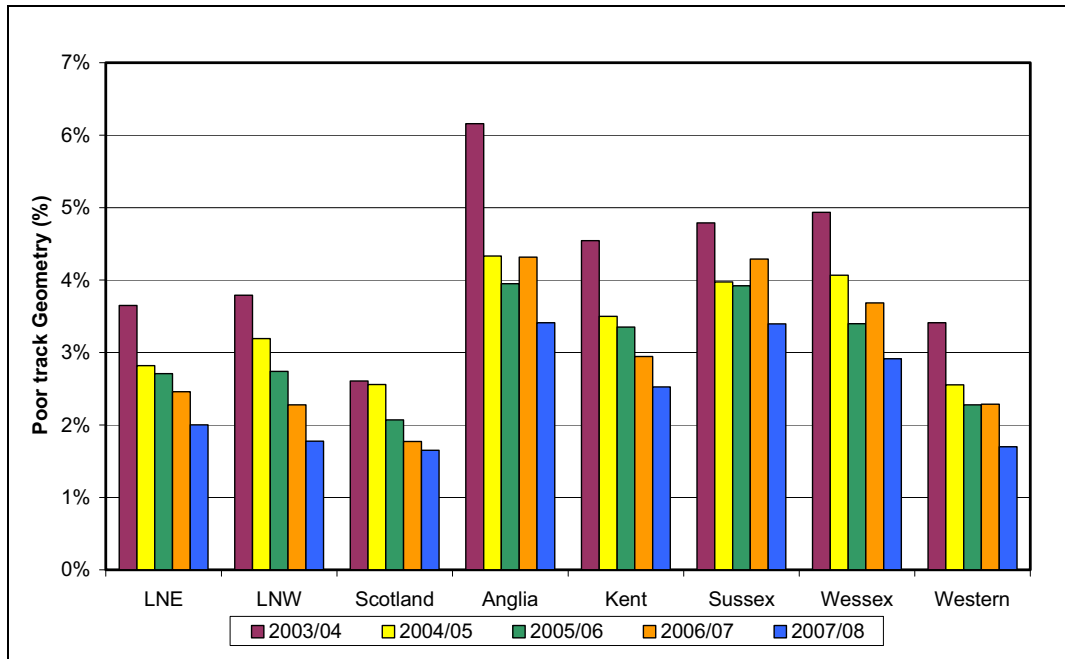


Figure 7.3.3 A comparison of Route PTG 2003/04 - 2007/08 (M3)

Speed band data

7.3.15 Figure 7.3.4 shows the overall SD results for each track geometry parameter against the speed bands for that parameter; there is a decrease for all measures compared with 2006/07.

Track geometry parameter	Linespeed range(mph)	Overall SD at year-end (mm)					Variance (06/07 vs. 07/08)
		2003/04	2004/05	2005/06	2006/07	2007/08	
35m Top	15-125	3.02	2.93	2.87	2.81	2.70	-0.11
	15-40	4.28	4.23	4.16	4.09	3.98	-0.11
	45-70	3.34	3.25	3.20	3.12	2.99	-0.13
	75-110	2.5	2.4	2.34	2.30	2.18	-0.12
	115-125	1.81	1.73	1.68	1.63	1.59	-0.04
35m Line	15-125	1.98	1.89	1.84	1.82	1.73	-0.09
	15-40	4.08	4.06	3.93	3.85	3.76	-0.09
	45-70	2.04	1.94	1.88	1.86	1.73	-0.12
	75-110	1.27	1.17	1.14	1.15	1.08	-0.07
	115-125	0.9	0.79	0.76	0.75	0.72	-0.03
70m Top	80-125	3.21	3.06	2.97	2.92	2.82	-0.10
	80-110	3.32	3.19	3.12	3.07	2.97	-0.10
	115-125	2.49	2.43	2.35	2.29	2.22	-0.07
70m Line	80-125	2.23	2.07	2.03	2.02	1.85	-0.18
	80-110	2.33	2.18	2.15	2.16	1.98	-0.18
	115-125	1.61	1.49	1.52	1.48	1.25	-0.23

Figure 7.3.4 Speed band standard deviations (M3)

Level 2 Exceedences

7.3.16 Figure 7.3.5 shows that this year all Routes had the lowest level of Level 2 exceedences per track mile for the last five years.

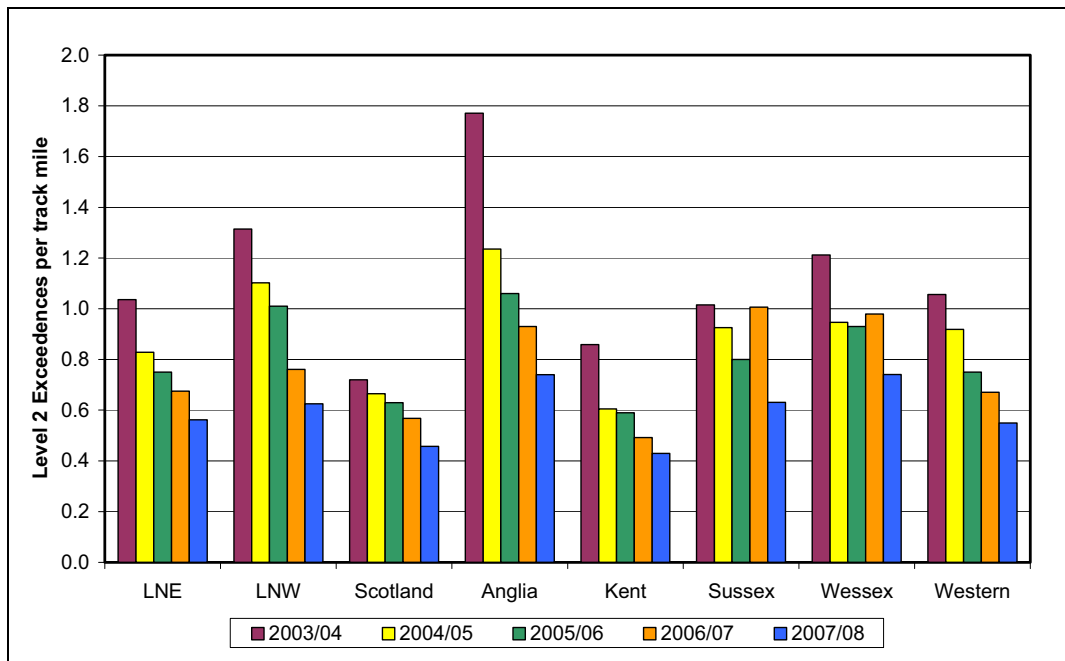


Figure 7.3.5 Level 2 exceedences for 2003/04 - 2007/08 (M5)

Audit findings

7.3.17 Network Rail have four track recording vehicles operating across the network which conduct the ‘compliant runs’ in accordance with the frequencies set out in the annual track measurement plan. The Southern Measuring Train (SMT), although fully approved and calibrated, is now being used for monitoring of the effects of any works.

Process

7.3.18 On completion of a recording run using the Serco-Lewis method (and LaserRail 3000 method on the New Measurement Train), the information is downloaded from the train’s recording system and uploaded to the CDMS system at the Engineering Support Centre in Derby. Each upload is a pack of files, containing measurements common to the range of parameters recorded on each vehicle. A team of analysts compares traces from every run with traces from previous runs on that line to identify any unexpected changes which may indicate errors in the data.

7.3.19 Following checking, the standard deviations for each eighth-of-a-mile are uploaded to the Track Quality Main Frame (TQMF) and to the Track Geometry Reports (TGR, formerly Condition Data Distribution System (CDDS)). From the TQMF, the National Engineering Information Analyst extracts the latest data to produce the four-weekly track geometry reports. The reports are checked for irregularities which are investigated. Reports are distributed to Territory and Area track engineers who use the information for developing track maintenance programmes. The reports are also uploaded onto the Portal Engineering Knowledge Hub.

7.3.20 Area track engineers also obtain track geometry information directly using TGR. TGR is fed with information directly from the track recording vehicles and provides the Area end-users with the information they require to enable them to manage, inspect and plan work arising from the track quality exceedancies recorded.

7.3.21 At the end of the year, the annual track geometry report is produced by the National Engineering Information Analyst and passed to the National Track Geometry and Gauging Engineer for sign-off.

7.3.22 We verified the process described above and inspected the spreadsheets used by the National Engineering Information Analyst.

Future Changes

7.3.23 It was noted from the audit that Network Rail plan future changes to bring the reporting of Level Two exceedences into line with European practice for track recording in Control Period 4. This will mean that the threshold will change for the reporting and minimum remedial action of discrete track geometry faults. This is due to a different shaped graph representing the threshold level being used in European standards when compared to the Network Rail graph.

Assessment of confidence grade

- 7.3.24 **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.
- 7.3.25 **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

7.3.26 We have audited the data presented in the Annual Return 2008 for Track Geometry (M3 & 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

7.3.27 We have no recommendations for this measure.

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

7.3.28 We have no observations for this measure.

Progress on outstanding recommendations from previous audit reports

7.3.29 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>2006-R22: 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>Network Rail have stated that this recommendation is being addressed as part of the board remit of work for the general modification and improvement of the measurement systems.</p> <p>Current Status – In Progress</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 2008, Section 3, Condition of asset temporary speed restriction sites (M4), including Tables 3.16 – 3.18.
- 7.4.2 The 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 4 weeks 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.
- 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 Network Rail's Headquarters, 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 numeric terms, the regulatory target is therefore:
- (a) Number of sites not greater than 942 (base-line) and 710 (2006/07);
 - (b) Severity score not greater than 4,622 and 3,246 (2006/07).
- 7.4.8 In 2007/08 there were 628 condition of asset TSRs on the network reportable for this measure with a total of severity score of 2,790 bettering the baseline target by 33% for the number of sites and by 40% for the severity score. These reported results would meet the regulatory target.

Trend

- 7.4.9 Figure 7.4.1 below illustrates how the reported TSRs are dominated by track-related faults, accounting for 94% of the total number and 98% of the total severity score.
- 7.4.10 Figure 7.4.2 shows the number of TSRs has improved significantly in most categories with earthworks achieving the highest reduction for both the number of sites and for severity scores – 33% and 66% respectively. Although structures saw a 66% increase in the number of sites, it should be noted that this high percentage increase was on a low base – the 2006/07 figure represents just 8 sites.

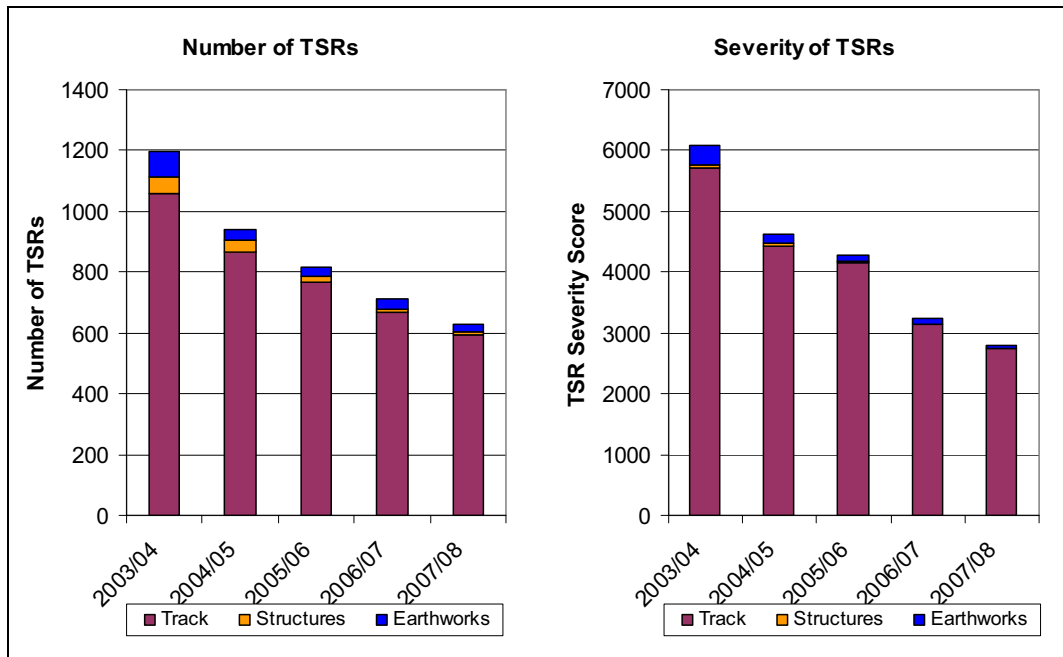


Figure 7.4.1 Number and severity of temporary speed restrictions (M4)

Measure (M4)	Cause of TSR	Variance 03/04-04/05	Variance 04/05 - 05/06	Variance 05/06 - 06/07	Variance 06/07 - 07/08
Number	Track	-18%	-12%	-13%	-11%
	Structures	-28%	-47%	-60%	63%
	Earthworks	-56%	-24%	18%	-33%
	Total	-21%	-13%	-13%	-12%
Severity Score	Track	-23%	-6%	-25%	-12%
	Structures	-17%	-62%	-12%	-20%
	Earthworks	-51%	-26%	-16%	-66%
	Total	-24%	-7%	-24%	-14%

Figure 7.4.2 Variance in Severity Score and Number of TSRs (M4)

7.4.11 Figure 7.4.3 and Figure 7.4.4 shows that nationally there is improvement in both TSR numbers and severity scores. However, In Scotland the number of TSR sites reportable to the M4 measure increased by 12%; despite this, there was a 31% improvement in the severity score for this Territory. Conversely, in South East Territory the severity score increased by 140%, despite a 13% reduction in the number sites. The majority of this score was in fact driven by just 2 sites, both on a secondary route. The national improvement this year has been driven by Western, which achieved a 21% reduction in the number of TSRs sites and a 51% reduction in the severity score.

Former Region/ Present Territory	2003/04	2004/05	2005/06	2006/07	2007/08	Variance
East Anglia & Southern/ South East	215	122	99	117	102	-13%
Great Western/ Western	199	130	95	87	69	-21%
LNE & MD & NW/ LNE & LNW	703	612	532	463	409	-12%
Scotland/ Scotland	82	78	89	43	48	12%
Total	1199	942	815	710	628	-12%

Figure 7.4.3 Number of temporary speed restrictions (M4); grouped for comparison (M4)

Former Region/ Present Territory	2003/04	2004/05	2005/06	2006/07	2007/08	Variance
East Anglia & Southern/ South East	530	166	142	154	370	140%
Great Western/ Western	908	591	538	472	231	-51%
LNE & MD & NW/ LNE & LNW	4410	3756	3451	2436	2132	-16%
Scotland/ Scotland	241	111	154	84	58	-31%
Total	6089	4624	4285	3246	2791	-14%

Figure 7.4.4 Severity of temporary speed restrictions (M4) ; grouped for comparison (M4)

Audit Findings

Process

Track

- 7.4.12 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 are planned and approved or (b) converted from Emergency Speed Restrictions to TSRs at the end of a 4-week qualifying period.
- 7.4.13 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.

- 7.4.14 The initial spreadsheet contains around 4,000 - 5,000 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, leaving a list of around 1500. These are then manually sifted again in order to link together TSRs at the same site ("parent-child" groupings). This takes the final number of TSRs used in the measure to around 600.

Earthworks and structures

- 7.4.15 Responsibility for calculating this measure lies with the Headquarters Engineering Reporting Manager (HQ ERM). The process for the 2008 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.
- 7.4.16 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.
- 7.4.17 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. At present, there is no back check to the WONs; 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.
- 7.4.18 The source spreadsheets are also shared with the Acting Possessions Support Specialist, enabling cross-checking between the two parts of M4 to take place.

Asset management

- 7.4.19 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

- 7.4.20 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. 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. Moreover, manual analysis of the data is 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 error.
- 7.4.21 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. Moreover, automatic checks are built into the spreadsheet that calculates the severity score.

- 7.4.22 Emergency Speed Restrictions (ESRs) are an issue. The process should be that any ESR longer than a week should be formally documented and included in the WON. The subject of this measure, the TSR, should be backdated to the beginning of the ESR within PPS. However, in practice, not all ESRs are documented in this way – ESR information is not therefore fully comprehensive. Where possible, this is mitigated by the APSSS via a manual check.
- 7.4.23 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; we were pleased to see that this year others were also involved in the process, ensuring that it is less reliant upon one person's skill set as well as providing an additional level of data checks.

Quality and accuracy checks

- 7.4.24 In order to understand the level to which any of the above might be a problem an audit was undertaken of reported Track TSRs. This comprised a spot check of a random sample of TSRs, pursuing the audit trail back to source data and checking for any anomalies. No major discrepancies were found that would materially affect the scores.
- 7.4.25 The audit revealed that 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 include:
- (a) Where linespeeds are variable (e.g. by freight/passenger) the higher speed is used for the purposes of the calculation – this may lead to an overstating of the severity factor.
 - (b) Where a TSR is split into two or more sections, separated by a non-restricted section that already has a lower line speed, the assumption is made that full speed could not be attained on the TSR sections, and the actual line speed is therefore more in line with the speed on the non-restricted section
 - (c) Where TSR includes or is adjacent to a station, it is assumed that trains that call at the station cannot achieve full line speed and hence the effect of the TSR is lowered.
- 7.4.26 The calculation spreadsheet and the formulae used to calculate the severity score were also checked. No disparities material to the final calculation were found.
- 7.4.27 We are satisfied that the process is carried out conscientiously and knowledgably. Significant efforts are made to by the Acting Possession Systems Support Specialist and Headquarters ERM to check data accuracy.

Assessment of confidence grade

- 7.4.28 **Reliability grade.** The definition of the measure is clearly documented. Though the procedure has not been updated to reflect the current organisation, it 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.

- 7.4.29 **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 impacted by risks from (a) ESRs being incorrectly input to PPS, and (b) the continuing degree of manual manipulation of raw data to produce the result. We believe M4 should continue to have an accuracy grade of 2.

Audit Statement

- 7.4.30 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2008 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.

Recommendations arising

- 7.4.31 **M4 recommendation 1.** As noted in our Audit Report we have doubts as to the usefulness of this measure. Moreover, data reporting against it is carried out by Network Rail purely for the Annual Return, suggesting it is not a measure they themselves find useful in monitoring the condition of their asset base. We recommend that Network Rail and ORR work 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.

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

- 7.4.32 We have no observations for this measure.

Progress on outstanding recommendations from previous audit reports

- 7.4.33 We set out below our assessment on the current progress of Network Rail in addressing our outstanding recommendations for Condition of Asset Temporary Speed Restriction Sites (M4) from our previous Audits:

Recommendations made	Progress update
2006-R23: We recommend the documents NR/ARM/M4PR (issue 5) and NR/ARM/M4DF (issue 6) are updated to reflect the change in organisation.	This work was begun, but discontinued when the responsible individual moved to another post. Current Status – No action or timescales identified
2007-R17: We recommend the additional process notes currently in development to document the manual manipulation and checking be incorporated within the RT/ARM/M4PR as further guidance to correct compilation of the measure.	This work was begun, but discontinued when the responsible individual moved to another post. Current Status – No action or timescales identified
2007-R18: We recommend the PPS system is considered for further enhancement to further automate the generation of the measure.	Network Rail have explored options for a centralised TSR management & reporting system as an enhancement to PPS. However, this is not currently a priority. Current Status – No action or timescales identified
2007-R19: We recommend instructions be re-issued to all local teams regarding the correct procedure for inputting Emergency Speed Restrictions to PPS.	This has been briefed out and the PPS Training course has been updated accordingly. Current Status – No action or timescales identified

Recommendations made	Progress update
<p>2007-R20: We recommend the definition of the measure be amended to remove the qualifying time period of >4weeks.</p>	<p>This measure was rejected by Network Rail on the basis both of the relevance of such a measure and the sheer workload required to report against it. We are content that this is dropped, provided the new recommendation made this year is acted upon. We are parking this recommendation subject to recommendation made for the 2007/08 year.</p> <p><i>Current Status – Parked by Reporter</i></p>

Figure 7.4.5 Progress on outstanding recommendations for Condition of asset temporary speed restriction sites (M4)

7.5 Earthworks Failures (M6)

Audit scope

- 7.5.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2008, Section 3, Earthworks Failures (M6) including Table 3.20.
- 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 each of the five Territories.

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 is 47 network wide earthworks failures.
- 7.5.6 For 2007/08, the result of Earthworks failures was 107 which would not meet the target for the year.

Trend

- 7.5.7 Figure 7.5.1 shows the 107 earthworks failures for 2007/08. There was a 15.9% increase in failures compared to 2006/07; 127.7% over the regulatory target. Earthworks failures causing train derailment decreased from three in 2006/07 to zero for the year ended 2007/08.

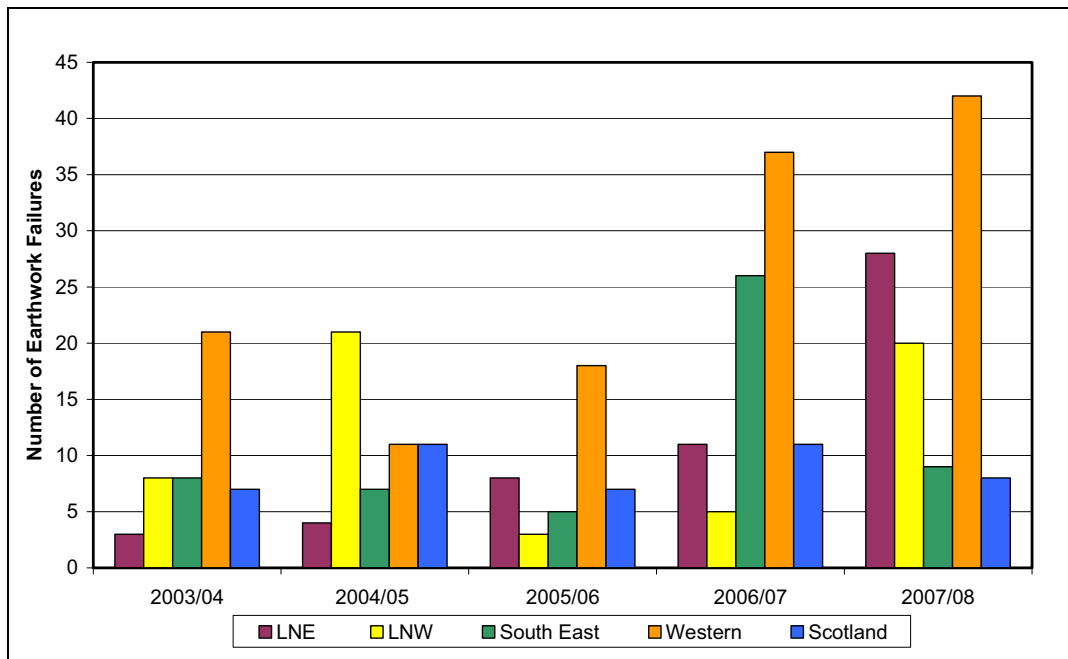


Figure 7.5.1 Number of Earthwork failures reported during the last five years (M6)

7.5.8 Figure 7.5.2 illustrates the distribution of events between Territories since the setting of the Regulatory target, and large fluctuations between years. The large stepped increase in volume in the past two years is attributed to significant, localised weather events. In London North Eastern, 22 of the 28 incidents occurred over 13 days in June 2007. Similarly for London North Western, 6 of the 20 incidents occurred over two days in August 2007.

Territory	2003/04	2004/05	2005/06	2006/07	2007/08	Variance % (06/07 vs. 07/08)
LNE	3	4	8	11	28	+154.5
LNW	8	21	3	5	20	+300.0
South East	8	7	5	26	9	-65.4
Western	21	11	18	37	42	+13.5
Scotland	7	11	7	11	8	-27.3
Total	47	54	41	90	107	+18.9

Figure 7.5.2 Variance of Earthwork failures (M6)

7.5.9 The number of incidents in Western Territory continues to rise; these incidents are largely confined to areas in Oxfordshire, Gloucestershire and Worcestershire, where a combination of geology, historic railway infrastructure construction issues and excessive weather events has created a large volume of reported incidents.

7.5.10 For each earthworks incident, Network Rail also produce 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.

7.5.11 Whilst the number of incidents per year has risen steeply, Figure 7.5.3 shows that the annual number of serious incidents (scoring 50 or over) has been steadily decreasing. The average hazard score per incident is also showing a downward trend.

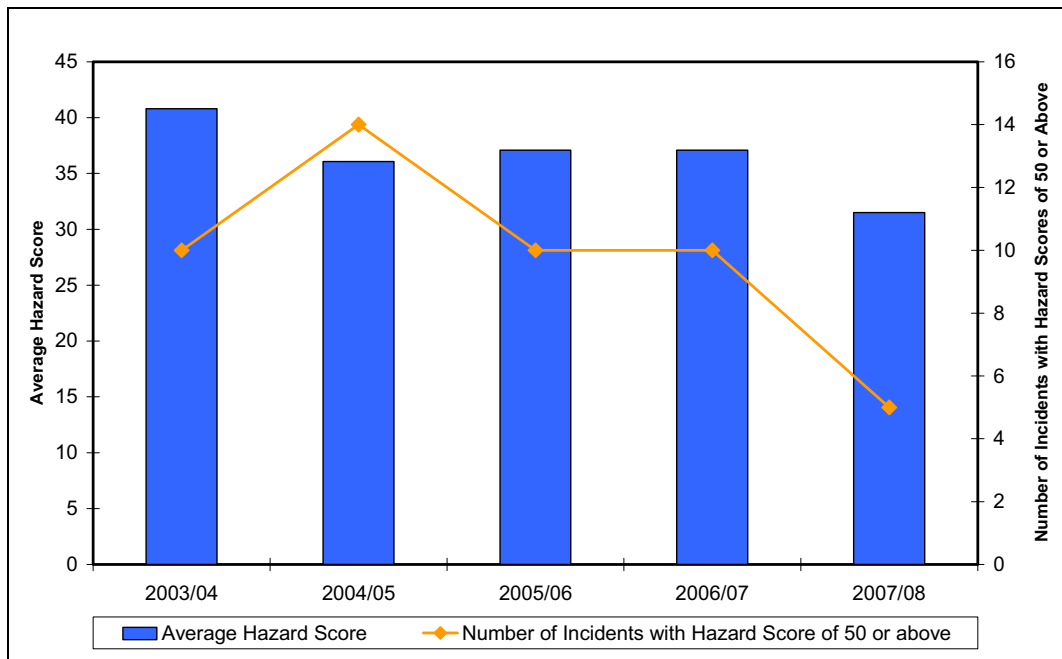


Figure 7.5.3 Incidents by Hazard Score (M6)

Audit findings

Measure Definition

- 7.5.12 A revised definition document NR/ARM/M6DF (Issue 6) was issued on 15 February 2008, in response to the recommendation made last year regarding reporting of multiple incidents. We have based the scope of this year's audit on this revised definition.
- 7.5.13 The following revised wording has been included to the ARM definition:
- "Multiple embankment and cutting failures that occur on the same Engineers Line Reference on the same day due to a single event are recorded as one event for the purpose of this definition".*
- 7.5.14 The Reporter does not accept this definition. The earthworks stock, for which Network Rail is responsible, is generally put to the test during weather events. It therefore follows that as a weather event would be concentrated in one area, it would put all those earthworks beneath (on the same ELR) under pressure at the same time.
- 7.5.15 We acknowledge that multiple failures can occur on the same earthwork structure, and that these should be counted as a single incident, however, we do not accept that other structures on the same line but some distance apart (and which also fail) should in effect be ignored in the count. The revised definition dilutes the assessment of whether the assets being maintained by Network Rail have sufficient robustness to support the railway.
- 7.5.16 In seeking a definition, we accept that there will be grey areas of interpretation. We are comfortable that an individual (presumably the Network Rail Headquarters Champion) should determine whether the incident is counted as a single or multiple incident in order to ensure consistency.

Process

- 7.5.17 The data acquisition, verification and reporting mechanisms for this measure have not materially changed this year, although the reporting definitions were updated to incorporate the recommendation from last year regarding the consistency of reporting multiple failures. Multiple failures on a single Engineer's Line Reference (ELR) caused by a single event are recorded as a single failure.
- 7.5.18 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. Further scoring systems "Soil Slope Hazard Index (SSHI)" and "Rock Slope Hazard Index (RSHI)" give a numerical score on the asset condition, which informs decisions on intervention and potentially overall asset population trends.
- 7.5.19 Despite this effort in assessing and managing the earthwork assets, the existing M6 measure is crude and highly skewed by weather events and thus provides little indication of Network Rail performance in managing these assets. We feel that the asset condition information being collected should be used to form the basis for a new measure for earthworks asset condition

Accuracy of reported data

- 7.5.20 For each Territory, we reviewed each of the M6 failures reported, except in Western, where we viewed a sample of failures. We then compared these to the Headquarters spreadsheet received at the start-up meeting.
- 7.5.21 The audit confirmed that data on incidents was being collected in accordance with the reporting procedure.

Assessment of confidence grade

- 7.5.22 **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.
- 7.5.23 **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

- 7.5.24 We have audited the reliability and accuracy of data and commentary presented in Network Rail’s Annual Return 2007/08 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

- 7.5.25 **M6 recommendation 1.** 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.
- 7.5.26 **M6 recommendation 2.** We recommend that the asset condition information being collected should be used to form the basis for a new measure for earthworks asset condition.

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

- 7.5.27 **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 will 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

- 7.5.28 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>2007-R21: 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 have 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>Current Status – Actioned and verified</p>

Figure 7.5.4 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 2008, Section 3, Bridge condition (M8), including Tables 3.21 – 3.23.
- 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 produces a condition score from 1 to 100; these are converted into condition grades which are integers from 1 to 5, where 1 is good condition and 5 is poor condition, using a linear scoring mechanism: 100-80 is condition grade 1, 79-60 is condition grade 2, 59-40 is condition grade 3, 39-20 is condition grade 4, 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). No changes to these documents have been made since the previous year.
- 7.6.4 Audits were undertaken at Network Rail Headquarters and at each of the five Territories.

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, which is anticipated to be 2008/09.
- 7.6.6 Therefore, there is currently no regulatory target for this measure.

Trends

- 7.6.7 SCMI scores for 4,168 bridges were entered into the tool in 2007/08. This brings the cumulative total of SCMI reports to 27,433. This total includes bridges that have now had second cycle examinations. Network Rail have advised that 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 20375 scores across five examination years.
- 7.6.8 The total population of assets which would qualify to have an SCMI examination remains uncertain. Historically, the figure above has been compared to the volume in GEOGIS (circa 41,000). However, the GEOGIS number is known to be misleading as it contains many anomalies. Anecdotal information provided by the Territories suggests that around 80-90% of the stock has now been assessed and included within the SCMI reporting tool.
- 7.6.9 Figure 7.6.1 shows the average SCMI band and SCMI score for structures examined since April 2003, which includes a total of 20,375 examinations. Network Rail have based their year on year analysis on the date at which the SCMI score is entered into the tool and not the date of the examination. This is misleading given the excessive length of time taken to submit results into the tool (see section 7.6.19 - 21). We do not agree with this approach and have carried out our analysis shown in Fig 7.6.1 on the date of examination.

Exam Year	Average Band	Average SCMI Score	Volume of Exams
2003/04	2.04	69.2	4,296
2004/05	2.09	67.7	4,337
2005/06	2.15	66.3	5,002
2006/07	2.12	67.2	4,063
2007/08	2.13	66.9	2,677
Years 2003/08	2.11	67.5	20,375

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

7.6.10 Figure 7.6.2 illustrates the cumulative distribution of grades for the past five years. Currently 61% of bridges scored are in condition grade 2, 76% are in the top two grades, and 98% are in the top three grades

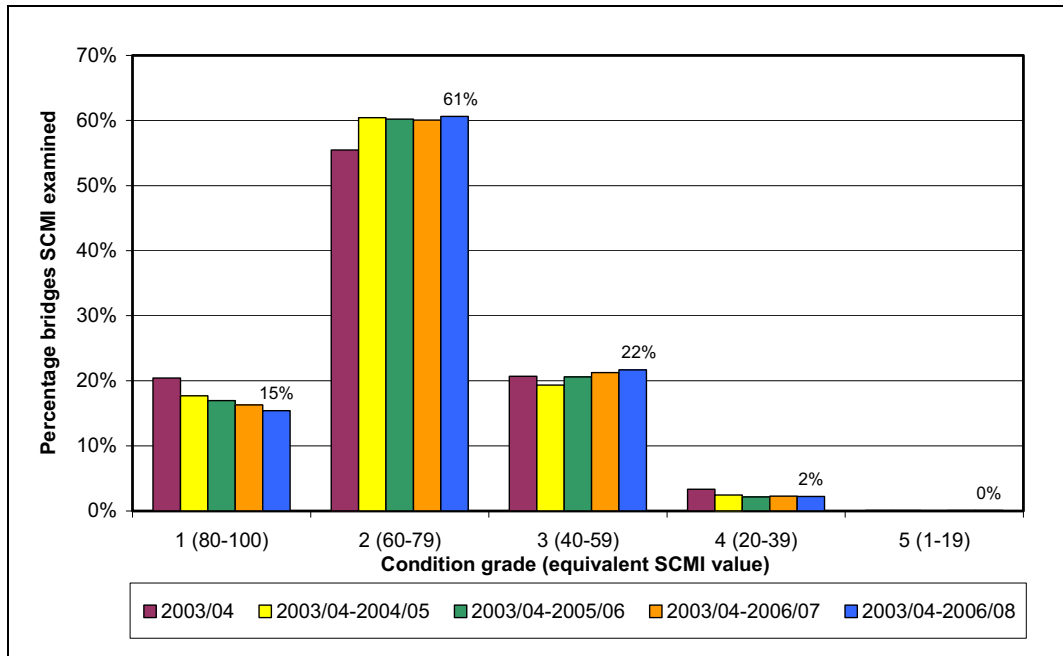


Figure 7.6.2 Bridge condition reported during the last five years (M8)

7.6.11 As the full asset population has not yet been inspected and 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 2007/08. Network Rail confirmed that no changes have been made to the definition and procedures for this measure since last year. Network Rail stated that it intended to revise the procedure following the introduction of Civils Asset Register and electronic Reporting System (CARRS).

- 7.6.13 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. Network Rail accept that there is concern over the quality of SCMI data pre 2003/04. On the basis that the first cycle commenced in 03/04, the full six year cycle should therefore be complete by March 2009. This assumption underpins our assessment that around 80-90% of the asset population have now been assessed.
- 7.6.14 We noted in our audit that Scotland Territory has recently moved the detailed examination cycle to 8 years.
- 7.6.15 SCMI exams are undertaken by structures examination contractors (SEC's). The SEC's have ten year contracts, of which 2007/08 is year five. The SEC prepares the SCMI examination data and passes this to the Network Rail Territory for entry into the SCMI tool. The SCMI tool is then interrogated by Network Rail Headquarters to provide data for the Annual Return. The process for transfer of information still contains a number of manual processes which add delay. There remains considerable scope for efficiency improvements in the process.

Accuracy of reported data

Programme

- 7.6.16 A major development since the last report has been the introduction by Network Rail of CARRS. This now provides a national database of the civils assets as opposed to local stand alone databases in the Territories. The CARRS system is used to manage the examination programme, monitor progress and hold "PDF" copies of the examination reports from the SEC's. The introduction of this tool is a major step forward in the asset stewardship of civils assets for Network Rail. For the first time Headquarters can readily access information on examination data without reference to the Territory.
- 7.6.17 The CARRS database will be the primary tool for identifying the asset population in future Annual Returns. However the present version of CARRS does not hold sufficient attribute information to identify if a structure would qualify for an SCMI examination. As mentioned previously, we consider that around 80-90% of the asset population have received an SCMI examination.
- 7.6.18 We were broadly satisfied that the programme of examinations (circa 1/6th of the population) was achieved in 2007/08.
- 7.6.19 As mentioned in previous annual returns, 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 anticipate around 4,400 SCMI reports to be undertaken in each year. A total of 2,677 exams were reported in 2007/08, which indicates that around 1700 (40%) had not been entered into the system. Our audits confirmed that a number of SEC's have a significant backlog of examinations to be submitted.
- 7.6.20 Figure 7.6.3 shows that, of the SCMI scores reported for 2007/08, the average time to enter an examination into the SCMI tool is 201 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 and is an increase on the 162 days from last year.

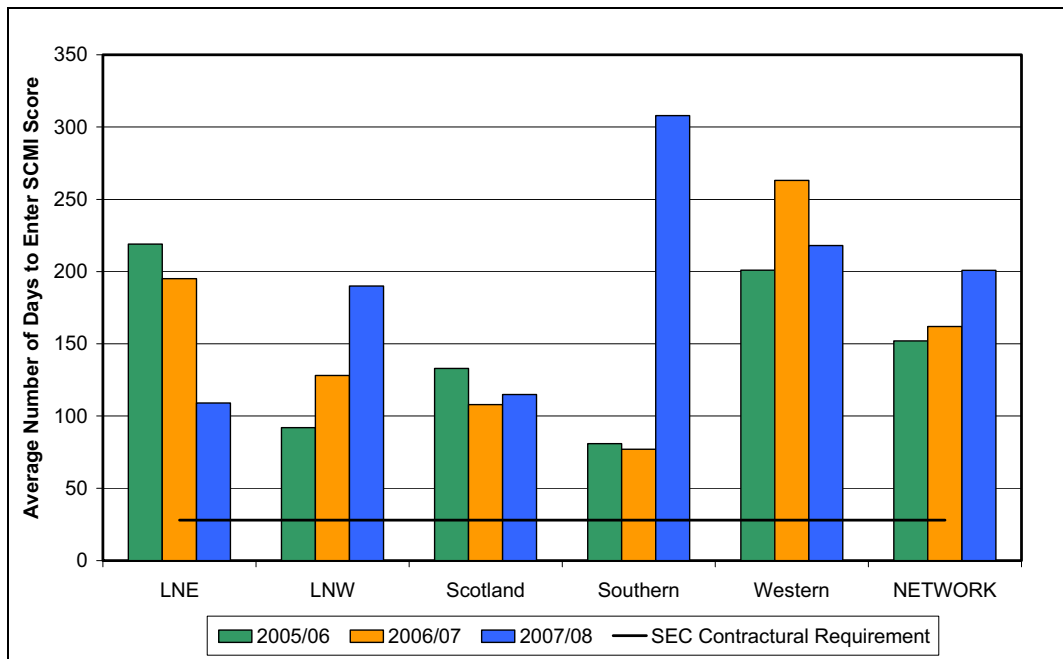


Figure 7.6.3 Average Number of Days from Examination to Entry into SCMI by Territory (M8)

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

Inspections reported for 2007/08

7.6.22 Since the previous Annual Return a further 4,168 SCMI examinations have been added to the SCMI tool. We requested a sample of five detailed examination reports for each Territory. These were randomly selected from the SCMI tool provided by Network Rail Headquarters. All of these were received and reviewed. We are broadly satisfied, from the evidence provided, that these examinations were undertaken and the actual conditions of each bridge were accurately reflected in the condition grade.

7.6.23 During the audit, we selected a random sample of five SCMI scores, either in hardcopy or from CDs, and cross-checked that these were in the national database. We found in all Territories that the SCMI scores checked had been uploaded successfully.

SEC checks and audits

7.6.24 Step 3 of the ARM procedure states that the SEC will undertake site samples of reports. We were broadly satisfied that the SEC's are undertaking site sampling to varying degrees and that these are well established practices; however one SEC did confirm that for 2007/08, such sampling had not been undertaken.

Network Rail checks and audits

7.6.25 Step 5 of the ARM procedure states that the Network Rail Territory will undertake reviews of sample reports and include site visits and checks. As mentioned in previous reports, this activity varies considerably across the network, with one Territory undertaking no checking and others providing variable checking.

7.6.26 A key indicator of this activity would be the number of reports returned to the SEC by Network Rail. Our audit did not identify any volume of SCMI reporting data being returned to the SEC for correction. This is in sharp contrast to the high level of data inaccuracies resulting from the Lloyds Register desk top review carried out in 2006/07 and their site based audits of 2005/06.

7.6.27 We conclude that this element of the procedure is not being adhered to.

- 7.6.28 Whilst not within the existing ARM procedure, Network Rail has historically commissioned national audits of the SEC examinations (by Lloyds Register). These have the considerable added advantage of assessing consistency of reporting across Territories. No such national audit was conducted in 07/08 despite the previous two audit reports raising significant concerns with regard to the quality of the data.

National comparability

- 7.6.29 The new Network Rail specification, NR/SP/CTM/017 (June 2006), for examination competencies does not cover SCMI examinations. The SEC's have not received instruction from Network Rail on how to proceed following the withdrawal of the previous standard NR/SP/CIV/047 which did cover SCMI in detail. Our audit did however confirm that, in the absence of advice, the SEC's were continuing to use the former standard for SCMI competence assessments.
- 7.6.30 Whilst some instruction has been issued to the SEC's (advice on scoring masonry brickwork), we have significant concerns about the development of the SCMI process and the accuracy and national uniformity of reports being submitted.
- 7.6.31 In particular we have concern over the approach to second cycle examinations. Our audit identified that, whilst a draft instruction had been issued by Network Rail on the subject, the SEC's were using a variety of approaches across the network. We would conclude that this will erode confidence in the uniformity of SCMI nationally.
- 7.6.32 We note that the SCMI user group is no longer in place due to financial constraints.
- 7.6.33 In summary, we consider that Network Rail has, due to financial restraints and other competing priorities (introduction of CARRS), not given SCMI examinations sufficient attention and the quality of data being prepared is deteriorating. In support of this argument we list the following cases:
- (a) SCMI not included on new CARRS database;
 - (b) No audits of SCMI examinations in past year;
 - (c) Abandonment of SCMI user group;
 - (d) Exclusion of SCMI in competence standards for examinations;
 - (e) No reports returned by Network Rail due to queries regarding SCMI;
 - (f) Absence of clear direction on second cycle examinations;
 - (g) The concerns raised by the last two Lloyds Register reports on SCMI data quality.
- 7.6.34 We consider that the SEC's might not unreasonably conclude that Network Rail did not consider SCMI of importance and hence the quality of SCMI data prepared would degrade.

Assessment of confidence grade

- 7.6.35 **Reliability grade.** The definition for this measure is documented. The process of condition inspections is subjective, and there have been no instructions from Network Rail as to the manner in which to conduct second cycle examinations. We believe the M8 measure should have a reliability grade of C.
- 7.6.36 **Accuracy grade.** Whilst the SCMI process is well established, we have significant concerns on the ongoing accuracy of data now being collected. This is primarily due to Network Rail paying insufficient attention to the process. We believe the M8 measure should have an accuracy grade of 3.

Audit Statements

- 7.6.37 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2008 for bridge condition (M8). We can confirm the data has generally been collected and reported in accordance with the relevant definition and procedure. Whilst the SCMI process is well established, we have significant concerns on the ongoing accuracy of data now being collected. This is primarily due to Network Rail paying insufficient attention to the process. 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

- 7.6.38 **M8 recommendation 1.** We recommend that the CARRs database be developed to include SCMI data.
- 7.6.39 **M8 recommendation 2.** 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.
- 7.6.40 **M8 recommendation 3.** We recommend that Network Rail commission research into the SCMI second cycle process and that clear instructions are issued to the SEC's.
- 7.6.41 **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.
- 7.6.42 **M8 recommendation 5.** We recommend that competency standards are re-introduced to Network Rail company standards.
- 7.6.43 **M8 recommendation 6.** We recommend that the SCMI user group is resurrected and given the support it requires to enable it to function.

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

- 7.6.44 **M8 observation 1.** We note Network Rail's statement that it intends to move to a risk based approach and that the interval frequency for SCMI examinations is likely to vary for specific structure types. The effects on future SCMI analysis need to be considered as part of this process. The alteration of the exam frequency for all structures in Scotland from 6 to 8 years is inconsistent with this statement.
- 7.6.45 **M8 observation 2.** We note that Network Rail are commencing analysis of the SCMI data for metal bridges with second cycle examinations. We would suggest that such data should be treated with caution given the small sample, uncertainty of the pre 2003/4 data collection and the absence of linkages between any interventions.

Progress on outstanding recommendations from previous audit reports

- 7.6.46 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
<p>2005-R19: 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>Current Status – In Progress</p>

Recommendations made	Progress update
<p>2006-R32: 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.</p>	<p>Network Rail accepted that local reporting is not working (ARM procedure step 5). Network Rail have cited budget constraints as barrier to further work. Current Status – In Progress</p>
<p>2006-R34: 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. Current Status – Repeated in later year (Recommendation 3 above)</p>
<p>2006-R35: 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. Current Status – Repeated in later year (Recommendation 4 above)</p>
<p>2007-R22: 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.</p>	<p>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. Current Status – Repeated in later year (Recommendation 5 above)</p>

Figure 7.6.4 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 2008, Section 3, Signalling failures (M9), including Table 3.24.
- 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 Audits were undertaken at Network Rail Headquarters and selected Areas of London North East in York and Sussex in Croydon and the fault control for London North Western Territory in Birmingham.

Commentary on reported data

Regulatory target

- 7.7.5 The regulatory target for signalling failures set in ORR’s 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.
- 7.7.6 In 2007/08, Network Rail reported 19,900 qualifying incidents attributed to signalling failures, which would meet the regulatory target.

Trend

- 7.7.7 Figure 7.7.1 shows performance 2004/05 to 2007/08; there has been an improvement of 12% on signalling failures in 2007/08. It can be seen that improvement has occurred in all Territories with the smallest being in Western Territory. As noted in the Network Rail commentary, this figure is a significant improvement on the regulatory target.

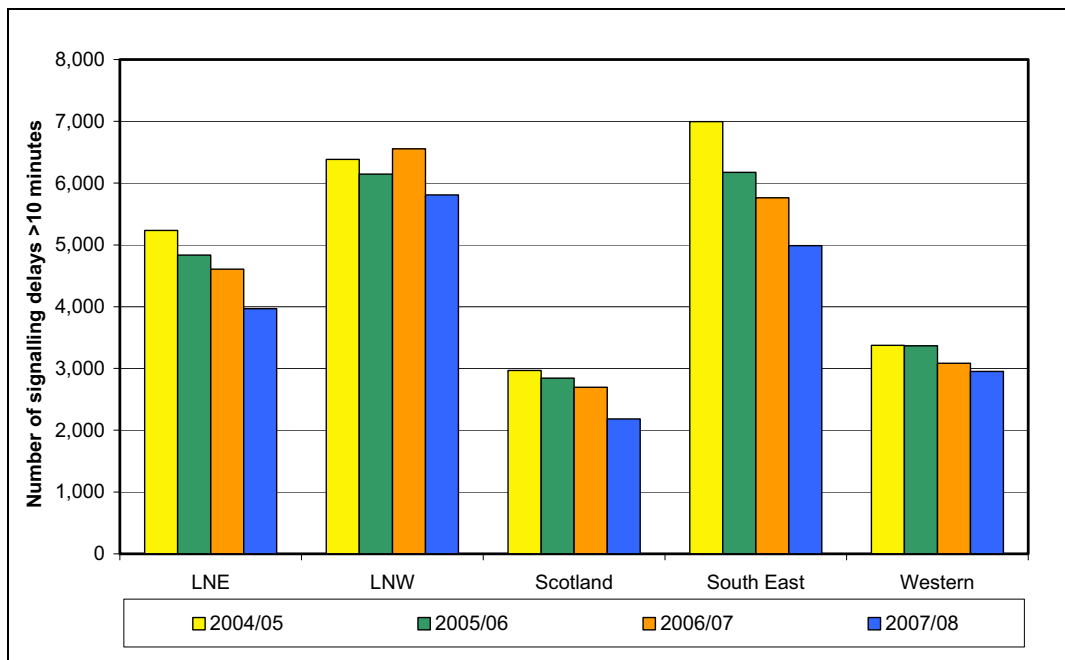


Figure 7.7.1 Number of signalling failures >10 minutes (M9)

- 7.7.8 Network Rail has attributed the improved performance to the installation of 8000 hour lamps and LED long range signals with the consequent reduction in lamp failures. An increasing number of High Performance Switch Systems (HPSS) for point operation has also contributed to the reduction in failures causing more than 10 minutes delay. Our Audits at the selected Areas demonstrated well established performance monitoring and action plans in place for the particular problems in the Area, with resources being targeted appropriately.
- 7.7.9 The number of signalling failures per million train kilometres is also presented in the Annual Return. This statistics 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

Data sourced from TRUST

- 7.7.10 The data for this measure is sourced from TRUST (Train Running System), the rail industry's delay measurement and attribution system, using delay categories specified in the definition of the measure. Attribution is undertaken by trained staff; data quality is monitored by a process of supervision and spot-audit. Allocation of delay to a particular company and delay category is based on the Delay Attribution Guide (DAG) and the delay attributor's knowledge of the root cause.
- 7.7.11 As noted in previous years, attribution of delay to signalling delay categories as defined in the DAG is not always appropriate for this measure, leading to a systematic over-reporting of signalling failures for measure M9; for example:
- (a) Track faults which cause points failure are initially categorised as signalling failures even if there is no signalling fault. These can actually be successful detections of unsafe situations by the signalling system, not failures of the signalling system.
 - (b) Track faults which cause track circuit failures are categorised as signal failures. Again, this is a successful detection by the signalling system, not a failure of the signalling system.
- 7.7.12 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.
- 7.7.13 At the end of 2007/08, 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 Headquarters Signalling team for reporting.

Commentary sourced from FMS

- 7.7.14 The Headquarters signalling team does not analyse or investigate the data from TRUST. The commentary provided by the Headquarters signalling team in the Annual Return is based on data from the Fault Management System (FMS), and information from the Signalling Performance Group in which issues and trends are highlighted in both a monthly and 6 monthly Review of Signalling Failures.
- 7.7.15 FMS is divided into "local" and "Central" sub systems. The local sub systems are used by the fault control centres to enter and manage the rectification of faults. The local systems then upload the fault information to the central system on a nightly basis. There is a mismatch between FMS local and FMS central in that certain fields are not uploaded to the central system. This was not seen as great issue by Network Rail Headquarters, in that if additional data was required, it would be specially requested from the Area concerned.
- 7.7.16 A fault can only be attributed and coded to a 'verified asset', i.e. an asset already entered into FMS. This raises the following issues:
- (a) Not all assets which fail have verified status in FMS. Network Rail estimates that 95% of signalling assets are verified. When changes take place to the asset base

there can be a time lag between the introduction into service of the asset and the FMS system being updated.

- (b) Engineers use a data analysis tool called DISCOVERER to obtain information from FMS. Experience has been gained by the users and it was not mentioned as causing any particular difficulties
- (c) Last year we reported that the ability of engineers to analyse the causes of signalling failures was reduced by the implementation of FMS and the associated data analysis tool. It is understood that Network Rail is continuing with the development of a replacement system.
- (d) Network Rail are simplifying the data structure for FMS failure causes, this will enable more consistency in FMS failure cause.

Correlation between FMS and TRUST reportable failures

- 7.7.17 In a previous audit we undertook analysis of the two data sources – FMS and TRUST to determine what level of correlation existed. We tried to link the data from FMS and TRUST but were unable to do so due to significant levels of incomplete data fields. During our visits last year to two Integrated Control Centres it became clear that the co-operation and checking between Operations Control functions and Fault Control functions worked together to ensure that delays were as accurately attributed as possible, with a check taking place to ensure that incidents were associated with equipment failures in both FMS and TRUST. The Integrated Control Centres appear to provide a significant improvement in communication between operations and fault control.
- 7.7.18 Our visits to Areas and fault control this year indicated that a changes to the control centre operators has resulted in staff with less technical knowledge entering data into the FMS system, hence the exact cause of failure is being passed verbally from technical staff on site to control staff having less technical understanding.
- 7.7.19 It is understood that trials were held some years ago with a hand held data entry device for use by technical staff to enter fault cause data into the system directly. This type of technology is now in widespread use in other areas of industry and it is understood that the initiative is being re-launched. A system of this nature would enable technical staff to ensure a more accurate fault cause to be recorded and allow fault control staff to concentrate on the strategic direction of faulting staff to failures of greatest impact.

Assessment of confidence grade

- 7.7.20 **Reliability grade.** The definition for this measure is clearly documented. A documented process has been followed to collect and report this measure. The commentary is based on data from the FMS system, which does not correlate well with TRUST. Steps are being taken in some Areas to align TRUST data and FMS data which does result in delays attributed to signalling failures to be reduced., because there are faults which cause less than 10 minutes delay to trains or no delay. 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 Territories. We believe that M9 should have a reliability grade of C.
- 7.7.21 **Accuracy grade.** The process of delay attribution is a subjective process often undertaken with considerable time pressure. Systematic errors introduced by the mismatch between the definition of this measure and the advice in the Delay Attribution Guide mean that this measure is over-reported but in a consistent manner. We believe that the accuracy of the data and commentary cannot be in any case better than 10%, hence we believe that M9 should have an accuracy grade of 4.

Audit Statement

7.7.22 We have audited the reliability and accuracy of the available data and commentary, within the Network Rail Annual Return 2008, 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. Due to the inherent reliability and accuracy of the data collection process and level of analysis backing the commentary, the data and commentary has been assessed as having a confidence grade of C4. The regulatory target for this measure has been met.

Recommendations arising

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

7.7.23 We have no recommendations for this measure.

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

7.7.24 **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.

Progress on outstanding recommendations from previous audit reports

7.7.25 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>2005-R23: 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. Current Status – Reclassified as an observation</p>
<p>2005-R24: 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. Current Status – Reclassified as an observation</p>
<p>2007-R23: 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. Current Status – In Progress</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 2008, Section 3, Signalling Asset Condition (M10), including Tables 3.25 – 3.27 .
- 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.
- 7.8.4 Audits were undertaken at Network Rail Headquarters and four of the five Territories: London North Eastern, Scotland, London North Western and Western. One SICA Assessments was attended in the Western Territory.

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 2007/08, Network Rail reported the average condition band to be 2.38, which would meet the regulatory target.

Trend

- 7.8.7 Figure 7.8.1 shows the trend for the asset condition of signalling interlockings. The reported proportion of assets in all grades has remained broadly the same with grade 2 (10 to 20 years remaining life) increasing slightly and the grade 3 (3 to 10 years remaining life) decreasing slightly.

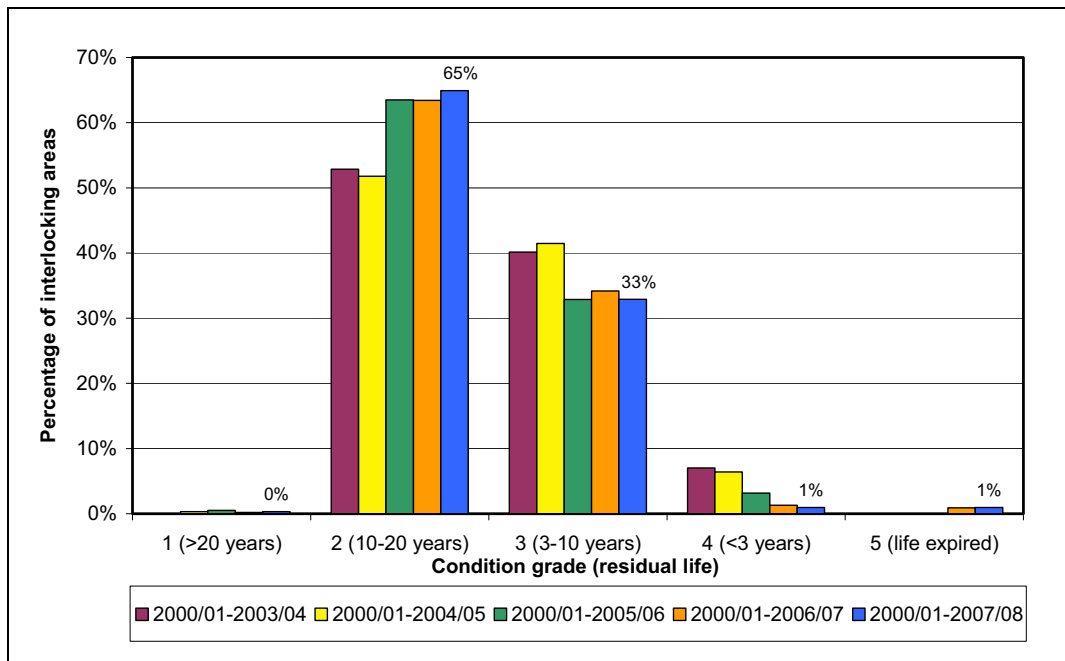


Figure 7.8.1 Average signalling asset condition (M10)

7.8.8 During the last two 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 that most of reported results are in the condition grade 2 (10 to 20 years remaining life). Network Rail has embarked on an exercise to refine the measurement tool with the object of providing a more representative spread for level crossings, to enable forward planning and prioritising of renewals.

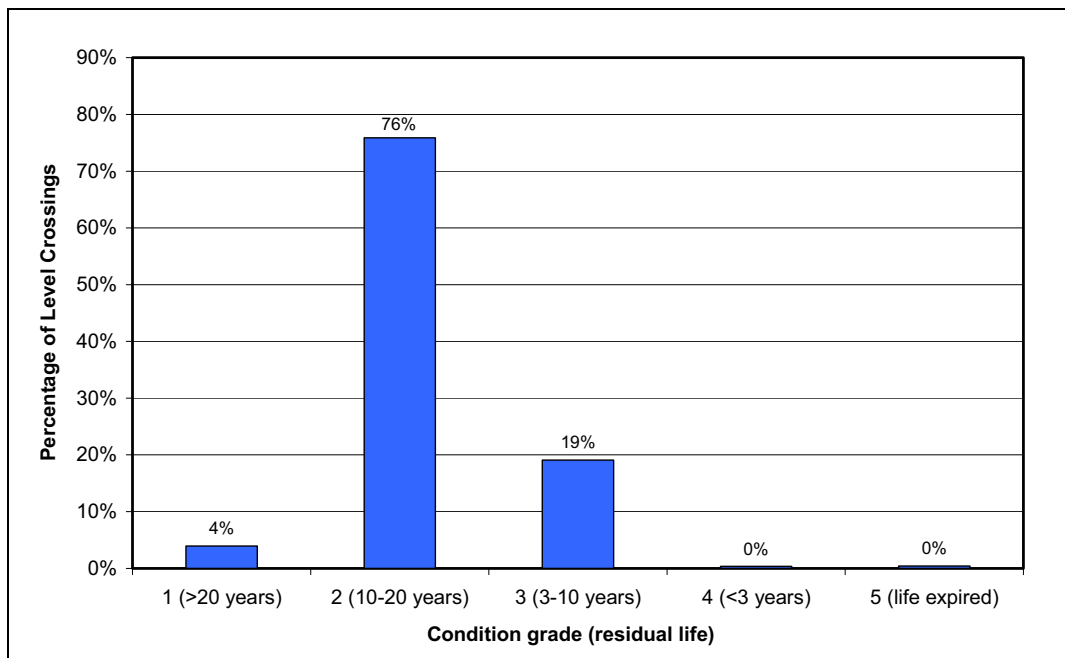


Figure 7.8.2 Average Level Crossing condition for 2007/08 (M10)

Audit findings

- 7.8.9 A revised procedure NR/ARM/M10PR (issue 6) was provided prior to the audit. It had been updated to reflect minor changes and clarifications to the reassessment intervals.

Programme

- 7.8.10 Network Rail's SICA Information System (SIS) provides transparent data storage and facilitates the reporting process. There are relatively few users of use of SIS, but its features and use are not documented. There is no subsequent process to check that the data entered into SIS is accurate. Network Rail indicated that training was planned.
- 7.8.11 The population of interlockings in each Territory changes each year as signalling schemes are commissioned and old interlockings replaced. The process of cross-checking and clarifying the number of interlockings recorded in the Interlocking Data Cards (IDCs) and within the SIS system was continued and there is high degree of confidence that all interlockings do have entries in the IDCs and SIS as appropriate. The filtering and refinement of the records associated with level crossings also continued.
- 7.8.12 NR/SP/SIG/13251 requires each Territory to maintain a register of all its installations to enable the current status of SICA assessment to be viewed
- 7.8.13 The steady state in the average condition can be attributed to the condition rating categories having a wide range and most interlockings are contained in the condition 2 band (10 to 20 years remaining life). The rationalisation of the data set is virtually complete.
- 7.8.14 Network Rail's procedure NR/ARM/M10PR set a target to assess 100% of interlockings by March 2006. There is no revised target set in Section 1.4 of the Asset Reporting manual. This requirement has been achieved.

SICA3

- 7.8.15 For 2007/08, condition assessments have been undertaken using SICA3 which provides either an overview of condition ('primary SICA3' or pSICA3) or a more detailed assessment of condition (a 'secondary SICA3' or sSICA3).
- 7.8.16 One of our technical experts observed a SICA3 assessments being undertaken at Park Junction. The assessment process was observed to be thorough and systematic. There was a methodical approach to the assessment of a representative selection of equipment. The maintenance engineers would also be consulted to determine any immediate plans for patch renewals or areas of concern that were not sampled but might have a bearing on the remaining life of the installation.
- 7.8.17 The ability to record the state of much of the equipment that was assessed in the form of digital photographs much improves the subsequent use of the assessment reports by Territory. It was apparent that the user group continues to maintain a common team approach to the assessment process, with a common understanding of the assessment of the more difficult situations and equipment.

Collection Process

- 7.8.18 For 2007/08, assessments have been mostly undertaken by dedicated Network Rail signalling assessment engineers, whose primary role is to conduct SICA assessments. SICA reports include a spreadsheet which is used to upload the data to SIS. Changes of staff occur in all organisations, and development of assessor competence is generally by coaching and mentoring once appointed.
- 7.8.19 Peer reviews of assessments were undertaken by senior Headquarters signalling engineers; at least one review was conducted for each Territory in 2007/08. We sampled the output of these Peer Reviews; the scope and approach to the review was appropriate.
- 7.8.20 From our audits, the key issues with regards to the collection process were:

- (a) The SICA User's Group (SUG) has continued to meet. This group involves SICA practitioners across the nation in exchange of ideas, consistency of application and solution to issues arising from use of the tool. The users' group also carry out a sample of SICA assessments together to ensure a consistent approach in using the tool. Minutes from various SUG meetings were provided which highlighted the beneficial actions coming out of the meetings.
 - (b) None of the Territories undertake formal audits on practitioners. The only 'audit' type process being carried out is the Headquarters Peer Review by senior Headquarters engineers, and reference is made to this in the revised draft procedure.
 - (c) The greatest difference between the Territories is in their approach to competence, training and succession issues. Most Territories had one Signal Assessment Engineer and a number of other staff who could act as assessors and a continuity of experience was maintained.
- 7.8.21 The national database, SICA Information System (SIS) allows for (amongst other things) (a) automated upload of SICA results directly from the summary spreadsheet and (b) reporting of the data for the Annual Return. SIS is securely available across the Network Rail intranet and thus is accessible at all levels of the organisation. Generally a separate condition assessment report is produced for use at Territory level. This will typically contain photographs, examples of specific problems noted and a record of any known minor renewals. This provides invaluable evidence to support and prioritise renewals projects.
- 7.8.22 As for previous years, the scores for primary SICAs are altered by Headquarters for the purposes of reporting, such that the remaining asset life is reduced by 22.5%, as Network Rail believes pSICA assessments over-estimate asset life. Though this clearly reflects a precautionary approach, there is no documented evidence to support the level of adjustment and the adjustment factor is not recorded in the definition or procedure as recommended after our 2005/06 audit. The adjustment factor is applied as part of the reporting function of SIS. It is suggested that this pessimism is documented but not amended since this would then alter the yardstick for previous years.

Asset Management

- 7.8.23 The assessment process using SICA has been used as the basis for scoping and prioritising Network Rail's renewals programmes, both at local and national levels. This has been assisted by the roll-out of SIS, which has made the data easier to access and use. Prioritisation of major schemes, which affect the renewals plans for those Areas, has been much facilitated by the advent of SIS and its ability to facilitate adjustment and review of the overall signalling strategy and individual elements of the renewals programme.
- 7.8.24 The overall condition summary shows that about one third of the signalling assets will need to be renewed in between 3 and 10 years time and about two thirds of the asset will remain serviceable for between 10 and 20 years. On a broad basis this would appear to be an achievable programme. Network Rail has renewals plans covering Control Periods 4, 5 and beyond.

Assessment of confidence grade

- 7.8.25 **Reliability grade.** The definition for this measure is clearly documented in a slightly revised ARM document. A documented process has been followed to collect and report this measure. In 2007/08 Network Rail has maintained the standard of management of condition data and SIS has proved to be a valuable tool in the asset management process. The process has been undertaken by persons with suitable levels of expertise supplemented by documented guidance and oversight by others. We believe that M10 should have a reliability grade of B.

7.8.26 **Accuracy grade.** The assessment process for determining remaining asset life is subjective but adequately allows prioritisation of renewals. The peer review process by Headquarters Engineers provides independent check on the accuracy of the resulting SICA scores against experience. The process for carrying out the assessments and producing condition reports remains robust, but subjective to a small extent. The procedures for entry of data are not documented. There is no simple check to confirm that data has been entered correctly. We believe that M10 should have an accuracy grade of 2

Audit Statement

7.8.27 We have audited the reliability and accuracy of the available data and commentary, within Network Rail's Annual Return 2008, 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

7.8.28 **M10 recommendation 1.** 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.

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

7.8.29 **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

7.8.30 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
2005-R31: 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. Current Status – Actioned and verified
2007-R24: 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. Current Status – Repeated in Later year
2007-R25: 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. Current Status – Actioned and verified

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 2008, Section 3, traction power incidents:
- (a) Alternating current traction power incidents causing train delays (M11), including Table 3.28;
 - (b) Direct current traction power incidents causing train delays (M12), including Table 3.29.
- 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 The definitions and procedure for these measures are documented in the Network Rail Asset Reporting Manual (ARM) documents:
- (a) NR/ARM/M11DF (issue 3)
 - (b) NR/ARM/M12DF (issue 3)
 - (c) NR/ARM/M11PR (issue 4)
- 7.9.4 These measures have a common procedure and data collection process; we have therefore audited and reported on these measures together. Audits were undertaken at Network Rail Headquarters and London North Eastern, London North Western and South East Territories. The London North Western Territory is responsible for reporting these measures for Western Territory.

Commentary on reported data

Regulatory target

- 7.9.5 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.
- 7.9.6 **M11.** In numerical terms, the regulatory target is to not exceed 107 OLE component failures causing train delay. For 2007/08, the result reported by Network Rail was 63, which would meet the regulatory target.
- 7.9.7 **M12.** In numerical terms, the regulatory target is to not exceed 30 conductor rail component failures causing train delay. For 2007/08, the result reported by Network Rail was 9, which would meet the regulatory target.

Trend

- 7.9.8 Figure 7.9.1 shows the number of reportable traction power incidents for 2007/08 has seen a downward trend from 2006/07. The results for 2007/08 are decreases of 9% and 18% for a.c. and d.c. incidents respectively.

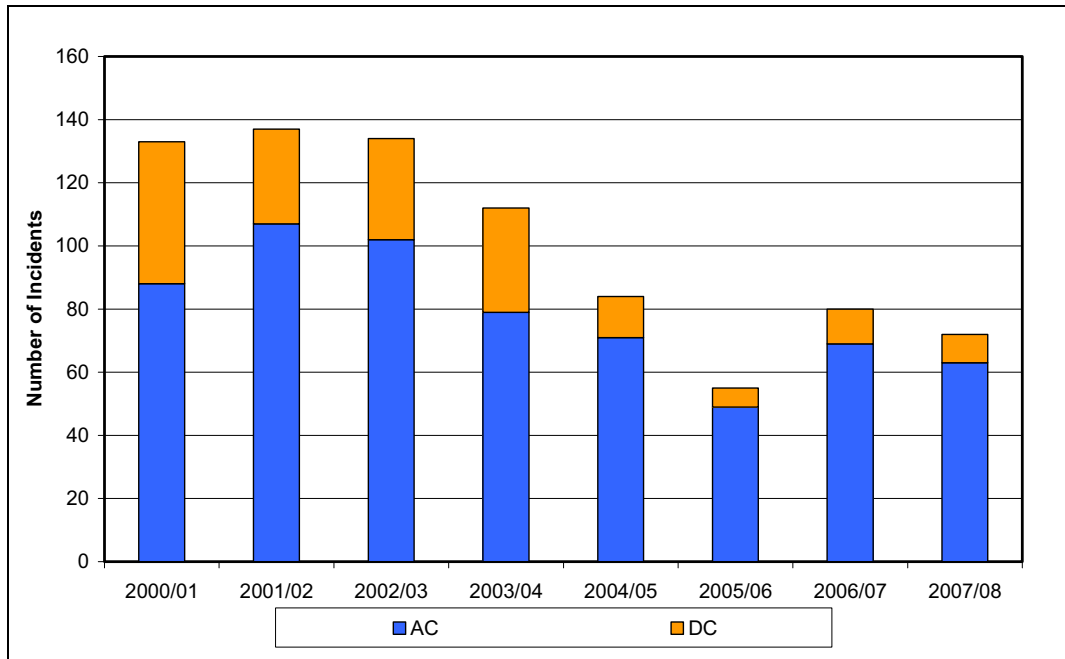


Figure 7.9.1 Traction power incidents causing over 500 train delay minutes (M11 & M12)

7.9.9 Figure 7.9.2 shows that despite the percentage of incidents having fallen in 2007/08, London North Eastern and South East (Sussex) Routes have seen an increase in incidents. Two Routes, Western and Scotland have remained unchanged. The remaining Routes have all seen an improvement in the number of incidents.

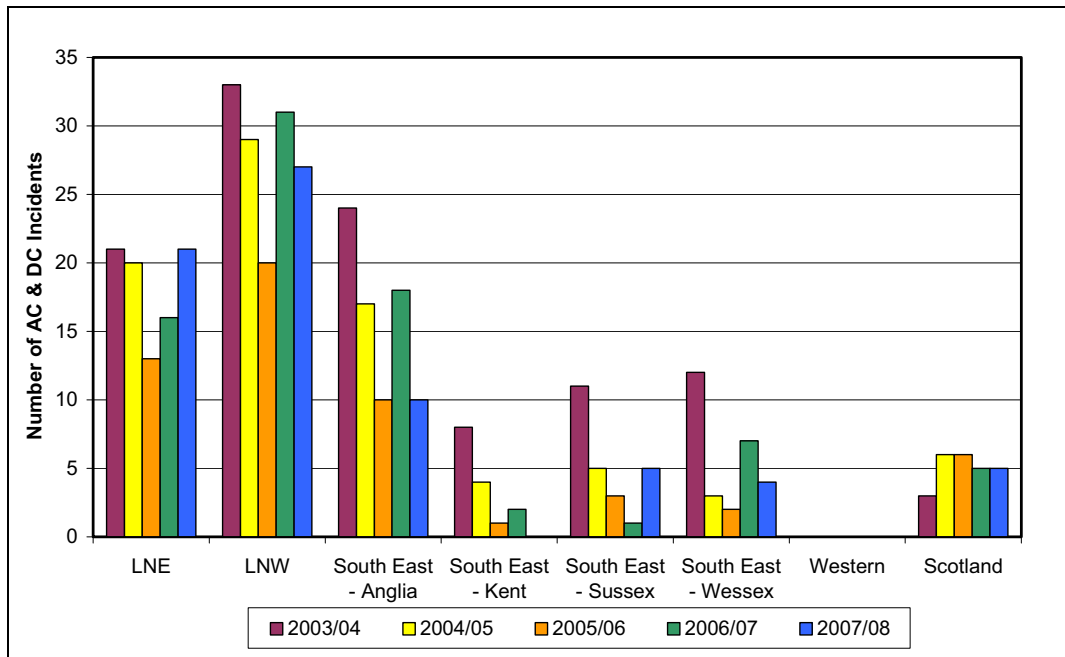


Figure 7.9.2 Number of a.c. and d.c. Incidents causing over 500 minutes delay (M11 & M12)

7.9.10 South East (Sussex) Route attributed their increase in conductor rail incidents to a faulty batch of MKVII hook switches. A reduction in OLE backlog and fewer conductor rail incidents have contributed to the significant fall in incidents reported in the other three South East Routes.

- 7.9.11 Network Rail stated that the increase in failures experienced by London North Eastern Route this year was mainly due to construction/maintenance delivery problems. Major works in improving the infrastructure saw that the 'burn in period' of new components was amongst problems that were factors in this result.
- 7.9.12 We were advised that the continuation of the renewal of 'over the boom' UK1 spec cantilevers and polymeric insulators has contributed to the reliability of the London North Western Route OLE for 2007/08; however some construction delivery problems did have adverse effects.
- 7.9.13 Figure 7.9.3 compares the incidents for 2006/07 and 2007/08 for each Route by failure analysis category given in the Headquarters spreadsheet. This figure supports the rationale given for the trends above.

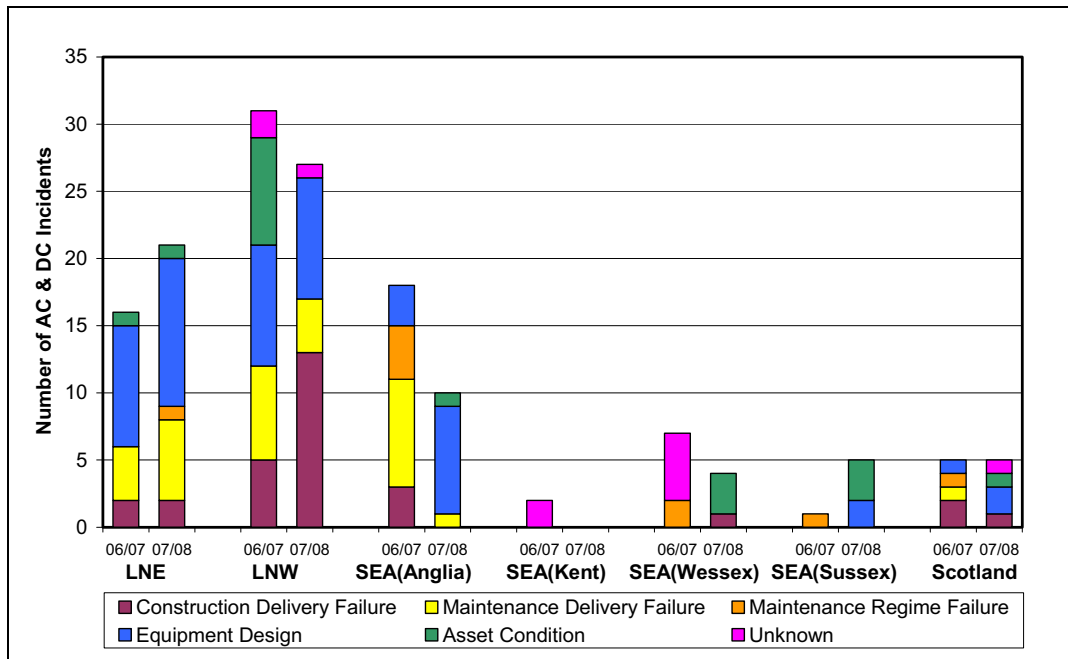


Figure 7.9.3 Comparison of a.c. and d.c. Incidents by Failure Analysis Category (M11 & M12)

Audit findings

Process

- 7.9.14 The data acquisition, verification and reporting mechanisms for this measure have not materially changed this year.
- 7.9.15 On a daily basis, the National Engineering Reporting team collate OLE and conductor rail component incidents from the national incident log into a single spreadsheet. Every four weeks, the spreadsheet is sent to the Territory E&P Engineers for verification that each incident meets the definition for measure M11 or M12; a commentary is provided as appropriate.
- 7.9.16 The Territories, in association with the relevant Area, use a variety of data sources to verify the incidents including Production Logs, TRUST and contact with personnel involved in the incident and its remediation. For incidents which involve a TOC, where the cause is not obvious, the Territories will appoint an outside party to investigate the incident.
- 7.9.17 The spreadsheet is returned to the National Engineering Reporting team for reporting on a four-weekly basis. In parallel, for asset management purposes the Territory E&P teams provide a formal report to the Headquarters E&P team on the incident. At year-end Territory Engineers formally sign-off the data to be reported.

Accuracy of reported data

- 7.9.18 We undertook a 100% desktop check of traction power incidents causing greater than 500 minutes of delay using the Headquarters spreadsheet, which included details of whether or not each large power incident had been accepted or rejected by the Territory E&P Engineers as falling within the definition of the M11 and M12 measures. From the limited description provided in the spreadsheet, we did not identify any errors in the allocation of incidents to electrification.
- 7.9.19 During the audit at each Territory, we also selected a sample of incidents that had been rejected and asked for explanation about the incident and reasons for rejection. Where required we asked for further documented evidence. We found for all the selected incidents, that the Territory E&P Engineer was able to justify the reasoning behind the rejection of the incident and provide evidence where required. Copies of the Territories final sign-off sheets were provided and these agreed with the reported numbers.
- 7.9.20 Using the year's final delay information³, 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 72 incidents accepted, we found that one a.c. incident caused only 495 minutes delay. We also found that two of the 15 incidents that were rejected due to being "less than 500 mins" actually caused 506 and 551 minutes respectively. Both of these were a.c. incidents.

Assessment of confidence grade

- 7.9.21 **Reliability grade.** The definitions for these measures are clearly documented. A single documented process has been followed to collect and report these measures. 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.
- 7.9.22 **Accuracy grade (M11).** Our samples found the data was recorded in the Headquarters spreadsheet with only a few minor inaccuracies and the Territories could justify their reasoning for the rejected incidents. We believe that M11 should have an accuracy grade of 2.
- 7.9.23 **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. The accuracy grade for M12 is therefore 'X' to indicate that an accuracy grade cannot be properly ascribed (as stipulated in the confidence grading guidance; Appendix D).

Audit Statements

- 7.9.24 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2008 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.
- 7.9.25 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2008 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.

³ TRUST data that has been processed through PMR-PUMPS (received from the Network Rail Performance reporting team)

Recommendations arising

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

7.9.26 We have no recommendations for this measure.

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

7.9.27 We have no observations for this measure.

Progress on outstanding recommendations from previous audit reports

7.9.28 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:

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

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 2008, Section 3, Electrification condition – a.c. traction feeder stations and track sectioning points (M13), including Table 3.30.
- 7.10.2 This is a condition measure for alternating current (a.c.) traction feeder stations (FSs) and track sectioning points (TSPs), 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 have 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.
- 7.10.4 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/M13PR (issue 7).
- 7.10.5 As part of the implementation of this change Asset Management Consulting Limited (AMCL), the Independent Reporter for Asset Management, was instructed to review the new asset condition assessment and data collection processes within the pilot Areas. The findings of AMCL’s review were made available to us and therefore, to avoid unnecessary double auditing, our audit was undertaken at Network Rail Headquarters only.

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 However, as this is the first year the new measure has been collected and no comparative measure for 2001/02 is available, the 2007/08 reported condition can not be assessed against this regulatory target.

Trend

- 7.10.8 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
Average Score using previous process	1.9	1.87	1.85	1.88	-
Average Score using new process	-	-	-	-	3.53

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

7.10.9 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 there has been a major shift in scores previously centred around grade 2, to the majority (71%) of inspections now resulting in a grade 4.

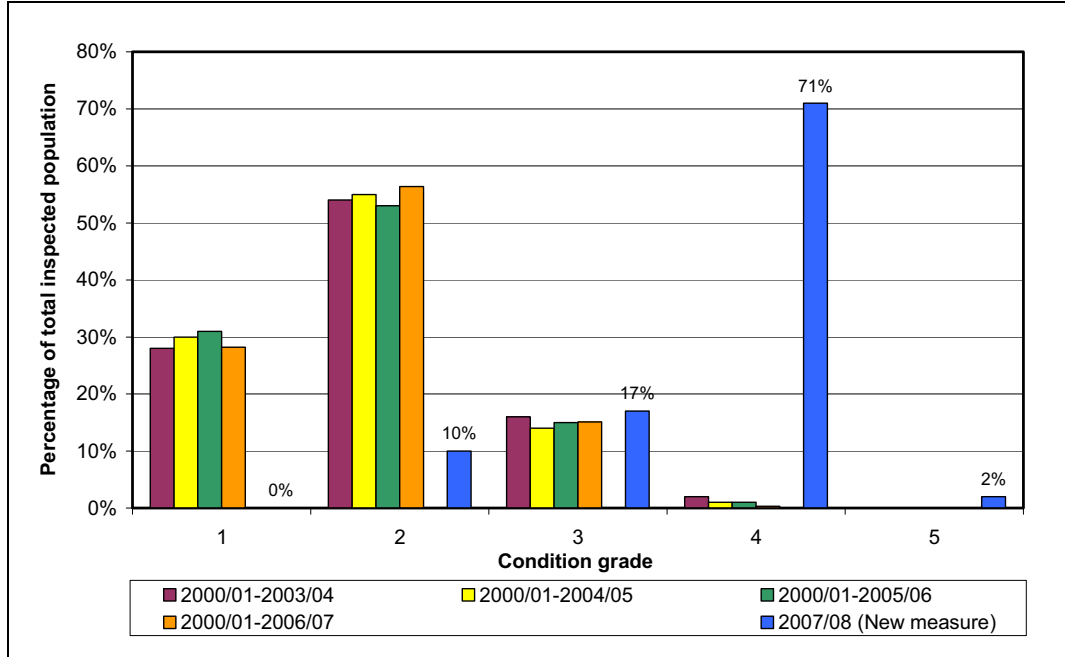


Figure 7.10.2 condition a.c. traction feeder stations & track sectioning points (M13)

Audit findings

7.10.10 The procedures NR/ARM/M13PR and NR/ARM/M13DF were revised in September 2007 to reflect revised process and responsibilities for the pilot Areas.

Piloted Process

7.10.11 The updated process, which was piloted in West Coast South and North Eastern Areas, shifted the responsibility for the data collection from the Territory engineers to the Maintenance organisation. In order to enable this shift Ellipse, Network Rail's Maintenance scheduling tool, was adapted to include a Condition Assessment module. This module was designed to record asset condition scores from the assessment questionnaire and collate and report the resulting M13 scores.

7.10.12 During the pilot period, Headquarters are parallel running a separate spreadsheet in order to check and validate the results being produced from Ellipse. Until the Ellipse algorithms have been validated, the Headquarters spreadsheet will be used to produce the figures for the Annual Return.

7.10.13 We are pleased to note that the algorithms in Ellipse used to calculate the average condition score applies natural rounding, which address the concern we've raised consistently over the last few years. The Headquarters' spreadsheet is also using natural rounding.

7.10.14 Part of the scope for the pilot was a review of the questionnaire, which lead to it being adapted to make the required information more quantitative and thus less subjective. This includes measurement of the trip times. For the questions which are still subjective, a detailed guidance to scoring has been provided, which provides criteria of each grade (1-5) for each assessment question.

- 7.10.15 The inclusion of these quantitative tests has been made possible by shifting these inspections to the Maintenance organisation, who are able to complete the questionnaire as part of their standard maintenance inspection cycle. This also offers the benefit of more regular data collection frequencies (every 2-4 years).
- 7.10.16 At the beginning and during the pilot, members from the Headquarters E&P team attended site visits with the Area maintenance teams to provide explanation and ensure consistence. General feedback from the Areas was that they were content with the process and could see value in it. Constructive criticism from these visits has lead to a few changes in the questionnaire, including the decision to remove of the partial discharge measurement, as it could not be done consistently.

AMCL's review of the new asset condition assessment and data collection processes

- 7.10.17 As mentioned above AMCL have reviewed the new asset condition assessment and data collection processes within the pilot Areas as part of their role as the Independent Reporter for Asset Management. Their final report⁴ identified a number of key findings. Set out below is a subset of the AMCL findings which we believe to be pertinent to M13:
- (a) The decision to base asset condition assessments on routine inspections appears to be a sensible efficient practice.
 - (b) There is evidence of a well structured and well defined suite of documents that describe the purpose of the new processes and how to carry out the new processes. However, the driver for the asset condition assessment within some of the process documentation appears to place the main emphasis on providing data to the ORR rather than the need to collect the data as part of good asset management practices.
 - (c) Feedback from the end users has been positive and there is evidence of the processes being modified to take account of constructive feedback.
 - (d) The new asset condition assessment processes will provide much greater coverage and sample size thereby improving the strategic view on asset condition.
 - (e) The weighting of the component parts of the asset condition assessment processes appear to have been well thought through.
 - (f) There is evidence that the new processes should help to deliver a consistent asset condition assessment activity across all Territories although due to ongoing status of the trial this has not been possible to completely verify.
 - (g) There is evidence that the processes to assess and collect asset condition data have been sensibly rationalised. Furthermore, the processes are in line with good practice that is commensurate with the maturity of asset condition measures in Network Rail.
 - (h) The new system for a.c./d.c. substation assets should allow for greater accountability and engagement as the maintainers are actively involved in the process.

Accuracy of reported data

- 7.10.18 We checked the Headquarters' summary spreadsheet and found it was correctly producing the numbers reported in the Annual Return; however it was noted that the figure of 3.35 given in the table of the draft annual return section for the Network average condition grade was a typo and should be 3.53. This error was raised with Network Rail and was corrected for the Final Annual Return.

⁴ AMCL Independent Reporter Report - Review of Task 3C Outputs, E&P: Asset Condition Data (Version 1.0)

- 7.10.19 We also checked the numbers given in an extract from the Ellipse condition module. We found a number of inconsistencies between these results and those in the Headquarters' summary spreadsheet. Network Rail have recognised these inconsistencies and are continuing to validate the Ellipse condition module data as part of the pilot. The Headquarters' summary spreadsheet will continue to be used until the issues are resolved.

Assessment of confidence grade

- 7.10.20 **Reliability grade.** The definition for this measure is clearly documented. A single documented process has been followed to collect and report this measure. The process of condition assessment has become more quantitative, however still contains subjective elements. We believe that M13 should have a reliability grade of B.
- 7.10.21 **Accuracy grade.** Our samples found the data was recorded accurately in the Headquarters spreadsheet this year. However the new process for data collection has only been used for 14% of the asset population which is insufficiently large to support a numeric assessment of the accuracy of this measure. The accuracy grade for M13 is therefore 'X' to indicate that an accuracy grade cannot be properly ascribed (as stipulated in the confidence grading guidance; Appendix D).

Audit Statement

- 7.10.22 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2008 for Electrification condition of a.c. traction feeder stations and track sectioning points (M13). 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. Achievement of the regulatory target for this measure can not be assessed.

Recommendations arising

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

- 7.10.23 We have no recommendations for this measure.

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

- 7.10.24 We have no observations for this measure.

Progress on outstanding recommendations from previous audit reports

- 7.10.25 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
2005-R33: 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. Current Status – Actioned and verified
2005-R34: 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). Current Status – Actioned and verified

Recommendations made	Progress update
<p>2005-R35: 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.</p>	<p>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. Current Status – Withdrawn</p>
<p>2006-R43: 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.</p>	<p>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. Current Status – Actioned and verified</p>
<p>2007-R26: 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>The new measure is using natural rounding Current Status – Actioned and verified</p>

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 2008, Section 3, Electrification condition – d.c. substations (M14), including Table 3.31.
- 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 have 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.
- 7.11.4 The definition and procedures for this measure are documented in the Network Rail Asset Reporting Manual, documents NR/ARM/M14DF (issue 4) and NR/ARM/M13PR (issue 7).
- 7.11.5 As part of the implementation of this change Asset Management Consulting Limited (AMCL), the Independent Reporter for Asset Management, was instructed to review the new asset condition assessment and data collection processes within the pilot Areas. The findings of AMCL's review were made available to us and therefore, to avoid unnecessary double auditing, our audit was undertaken at Network Rail Headquarters only.

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 However, as this is the first year the new measure has been collected and no comparative measure for 2001/02 is available, the 2007/08 reported condition can not be assessed against this regulatory target.

Trend

- 7.11.8 Figure 7.10.1 shows that the average score obtained using the new M14 measure is not comparable to the relatively steady trend of the previous inspection method.

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

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

- 7.11.9 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 7.10.2. It can be seen that there has been a major shift in scores previously centred around grade 2, to the majority (80%) of inspections now resulting in a grade 4.

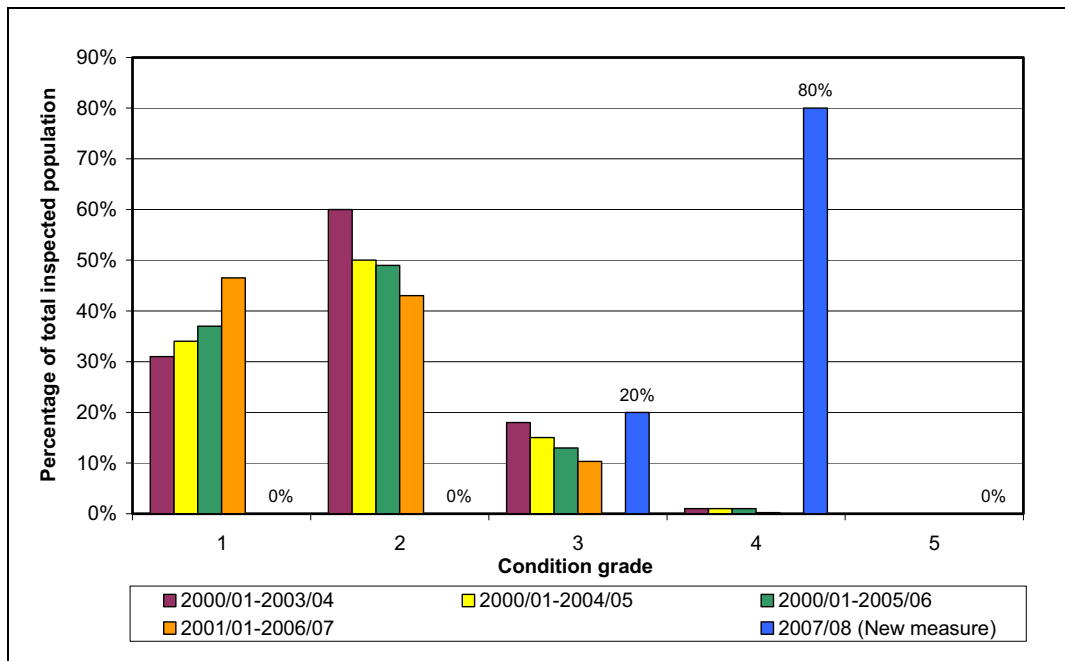


Figure 7.11.2 Average condition grade for d.c. sub-stations (M14)

Audit findings

7.11.10 The procedures NR/ARM/M14PR and NR/ARM/M14DF were revised in September 2007 to reflect revised process and responsibilities for the pilot Areas. The procedure for this measure is almost identical to that described in M13.

Piloted Process

- 7.11.11 The updated process, which was piloted in West Coast South and North Eastern Areas, shifted the responsibility for the data collection from the Territory engineers to the Maintenance organisation. In order to enable this shift Ellipse, Network Rail’s Maintenance scheduling tool, was adapted to include a Condition Assessment module. This module was designed to record asset condition scores from the assessment questionnaire and collate and report the resulting M14 scores.
- 7.11.12 During the pilot period, Headquarters are parallel running a separate spreadsheet in order to check and validate the results being produced from Ellipse. Until the Ellipse algorithms have been validated, the Headquarters spreadsheet will be used to produce the figures for the Annual Return.
- 7.11.13 We are pleased to note that the algorithms in Ellipse used to calculate the average condition score applies natural rounding, which address the concern we’ve raised consistently over the last few years. The Headquarters’ spreadsheet is also using natural rounding.
- 7.11.14 Part of the scope for the pilot was a review of the questionnaire, which lead to it being adapted to make the required information more quantitative and thus less subjective. This includes measurement of the trip times. For the questions which are still subjective, a detailed guidance to scoring has been provided, which provides criteria of each grade (1-5) for each assessment question.
- 7.11.15 The inclusion of these quantitative tests has been made possible by shifting these inspections to the Maintenance organisation, who are able to complete the questionnaire as part of their standard maintenance inspection cycle. This also offers the benefit of more regular data collection frequencies (every 2-4 years).

7.11.16 At the beginning and during the pilot, members from the Headquarters E&P team attended site visits with the Area maintenance teams to provide explanation and ensure consistence. General feedback from the Areas was that they were content with the process and could see value in it. Constructive criticism from these visits has lead to a few changes in the questionnaire, including the decision to remove of the partial discharge measurement, as it could not be done consistently.

AMCL's review of the new asset condition assessment and data collection processes

7.11.17 As mentioned above AMCL have reviewed the new asset condition assessment and data collection processes within the pilot Areas as part of their role as the Independent Reporter for Asset Management. Their final report⁵ identified a number of key findings. Set out below is a subset of the AMCL findings which we believe to be pertinent to M14:

- (a) The decision to base asset condition assessments on routine inspections appears to be a sensible efficient practice.
- (b) There is evidence of a well structured and well defined suite of documents that describe the purpose of the new processes and how to carry out the new processes. However, the driver for the asset condition assessment within some of the process documentation appears to place the main emphasis on providing data to the ORR rather than the need to collect the data as part of good asset management practices.
- (c) Feedback from the end users has been positive and there is evidence of the processes being modified to take account of constructive feedback.
- (d) The new asset condition assessment processes will provide much greater coverage and sample size thereby improving the strategic view on asset condition.
- (e) The weighting of the component parts of the asset condition assessment processes appear to have been well thought through.
- (f) There is evidence that the new processes should help to deliver a consistent asset condition assessment activity across all Territories although due to ongoing status of the trial this has not been possible to completely verify.
- (g) There is evidence that the processes to assess and collect asset condition data have been sensibly rationalised. Furthermore, the processes are in line with good practice that is commensurate with the maturity of asset condition measures in Network Rail.
- (h) The new system for a.c./d.c. substation assets should allow for greater accountability and engagement as the maintainers are actively involved in the process.

Accuracy of reported data

7.11.18 We checked the Headquarters' summary spreadsheet but could not reproduce the average condition score of 3.61 given in the Annual Return. Our calculations showed a score of 3.52. This inconsistency had not been explained by Network Rail at the time of publishing this Final Report.

7.11.19 Due to the small sample available, we haven't reviewed the Ellipse data against the Headquarters' summary spreadsheet, however we would expect there to be the potential for similar inconsistencies as where encountered in M13 audit. Network Rail have recognised these inconsistencies and are continuing to validate the Ellipse condition module data as part of the pilot. The Headquarters' summary spreadsheet will continue to be used until the issues are resolved.

⁵ AMCL Independent Reporter Report - Review of Task 3C Outputs, E&P: Asset Condition Data (Version 1.0)

Assessment of confidence grade

- 7.11.20 **Reliability grade.** The definition for this measure is clearly documented. A single documented process has been followed to collect and report this measure. The process of condition assessment has become more quantitative, however still contains subjective elements. We believe that M14 should have a reliability grade of B.
- 7.11.21 **Accuracy grade.** Our samples found the data was recorded accurately in the Headquarters spreadsheet this year. However the new process for data collection has only be used for 1% of the asset population which is insufficiently large to support a numeric assessment of the accuracy of this measure. The accuracy grade for M14 is therefore 'X' to indicate that an accuracy grade cannot be properly ascribed (as stipulated in the confidence grading guidance; Appendix D).

Audit Statement

- 7.11.22 We have audited the reliability and accuracy of data and commentary presented in Network Rail’s Annual Return 2008 for Electrification condition of d.c. substations (M14). 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. Achievement of the regulatory target for this measure can not be assessed.

Recommendations arising

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

- 7.11.23 We have no recommendations for this measure.

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

- 7.11.24 We have no observations for this measure.

Progress on outstanding recommendations from previous audit reports

- 7.11.25 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
<p>2006-R45: 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.</p>	<p>As part of the development of the new measure the questionnaire has been reviewed and updated in association with maintenance. Current Status – Actioned and verified</p>
<p>2006-R46: 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.</p>	<p>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. Current Status – Actioned and verified</p>
<p>2007-R27: 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>The new measure is using natural rounding Current Status – Actioned and verified</p>

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 2008, Section 3, Electrification condition – a.c. traction contact systems (M15), including Tables 3.32 – 3.33.
- 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 is completed during the normal maintenance inspection, 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 During 2007/08 Network Rail have 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.
- 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).
- 7.12.5 As part of the implementation of this change Asset Management Consulting Limited (AMCL), the Independent Reporter for Asset Management, was instructed to review the new asset condition assessment and data collection processes within the pilot Areas. The findings of AMCL's review were made available to us and therefore, to avoid unnecessary double auditing, our audit was undertaken at Network Rail Headquarters only.

Commentary on reported data

- 7.12.6 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 1.8.
- 7.12.7 The extrapolated average condition score reported by Network Rail for year-end 2007/08 was unchanged from 2006/07 at 1.7, which would meet the regulatory target.

Trend

- 7.12.8 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	00/01-03/04	00/01-04/05	00/01-05/06	00/01-06/07	00/01-07/08
Average Condition Score	1.7	1.7	1.7	1.7	1.7
% of Asset Surveyed	15%	17%	21%	27%	30%

Figure 7.12.1 a.c. traction contact systems (M15)

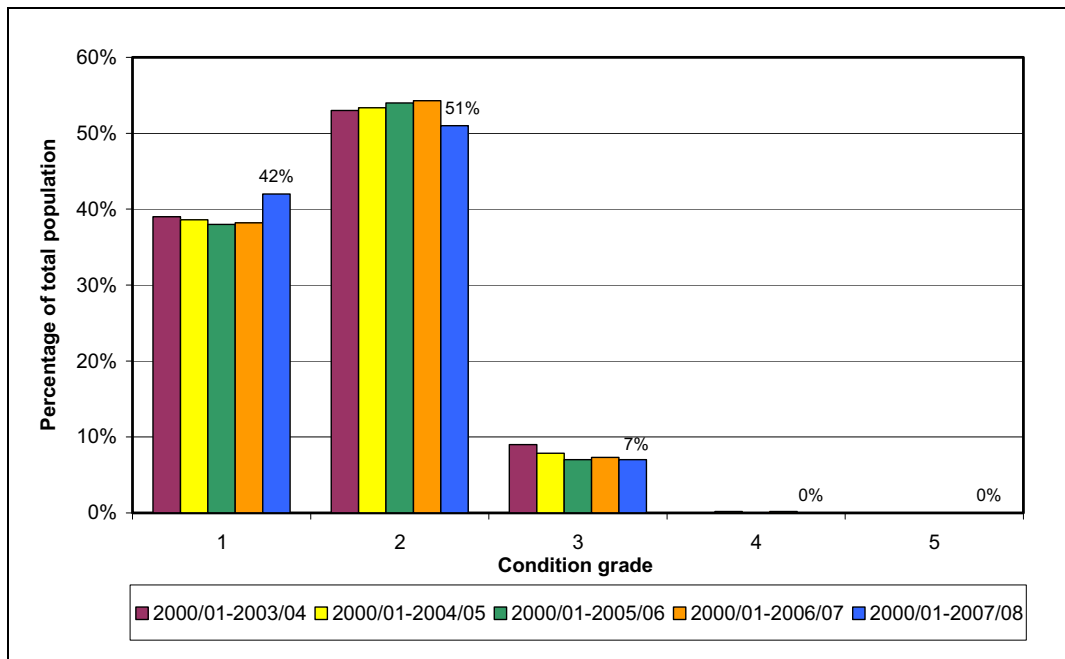


Figure 7.12.2 Average condition grade of a.c. traction contact systems (M15)

Audit findings

7.12.9 The procedures NR/ARM/M15PR and NR/ARM/M15DF were revised in September 2007 to reflect revised process and responsibilities for the pilot Areas.

Piloted Process

7.12.10 The updated process, which was piloted in West Coast South and North Eastern Areas, shifted the responsibility for the data collection from the Territory engineers to the Maintenance organisation. In order to support this shift Ellipse, Network Rail's Maintenance scheduling tool, was adapted to include a Condition Assessment module.

7.12.11 This module was designed to record asset condition scores from the assessment questionnaire and collate and report the resulting M15 scores. However, the reporting component of the system is not yet developed, so the collation and reporting is still being prepared via the previous Headquarters' spreadsheet. This has meant that the score is still being calculated by rounding component scores down. Network Rail have advised that this practice has only been maintained for consistency purposes, and once the dataset is larger, the scores will be recalculated using natural rounding.

7.12.12 Part of the scope for the pilot was a review of the questionnaire and aligning it with Ellipse standard jobs. This has enabled the questionnaire to be completed by technical support personnel in the Maintenance organisation, who conduct a desktop exercise of mapping the Ellipse data collected through foot patrols to the questionnaire. By using this standard maintenance foot patrols data, it enables more regular data collection frequencies (every 2-4 years).

AMCL's review of the new asset condition assessment and data collection processes

7.12.13 As mentioned above AMCL have reviewed the new asset condition assessment and data collection processes within the pilot Areas as part of their role as the Independent Reporter for Asset Management. Their final report identified a number of key findings. Set out below is a subset of the AMCL findings which we believe to be pertinent to M15:

- (a) The decision to base asset condition assessments on routine inspections appears to be a sensible efficient practice.

- (b) There is evidence of a well structured and well defined suite of documents that describe the purpose of the new processes and how to carry out the new processes. However, the driver for the asset condition assessment within some of the process documentation appears to place the main emphasis on providing data to the ORR rather than the need to collect the data as part of good asset management practices.
- (c) The new asset condition assessment processes will provide much greater coverage and sample size thereby improving the strategic view on asset condition.
- (d) The weighting of the component parts of the asset condition assessment processes appear to have been well thought through.
- (e) There is evidence that the new processes should help to deliver a consistent asset condition assessment activity across all Territories although due to ongoing status of the trial this has not been possible to completely verify.
- (f) There is evidence that the processes to assess and collect asset condition data have been sensibly rationalised. Furthermore, the processes are in line with good practice that is commensurate with the maturity of asset condition measures in Network Rail.

Accuracy of reported data

7.12.14 We checked the Headquarters' summary spreadsheet and found it was correctly producing the numbers reported in the Annual Return; however it was noted that there is a rounding error on the percentages given in the draft Annual Return for grades 2 and 3. This error was raised with Network Rail, however this was not corrected for the Final Annual Return.

Assessment of confidence grade

7.12.15 **Reliability grade.** The definition for this measure is clearly documented. A single documented process has been followed to collect and report this measure. The process of condition assessment has become more quantitative, however still contains subjective elements. We believe that M15 should have a reliability grade of B.

7.12.16 **Accuracy grade.** Our samples found the data was recorded accurately in the Headquarters spreadsheet this year. However, the process of condition assessment is subjective and only 30% of the asset population has been assessed. We remain concerned by the method of calculation the Network average by rounding down of individual scores. We believe that M15 should have an accuracy grade of 3.

Audit Statement

7.12.17 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2008 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 B3. The regulatory target for this measure has been met.

Recommendations arising

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

7.12.18 We have no recommendations for this measure.

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

7.12.19 We have no observations for this measure.

Progress on outstanding recommendations from previous audit reports

7.12.20 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>2005-R37: 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. Current Status – Actioned and verified</p>
<p>2005-R38: 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. Current Status – In progress</p>
<p>2006-R48: 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. Current Status – In progress</p>
<p>2007-R28: 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. Current Status – In progress</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)

- 7.13.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail’s Annual Return 2008, Section 3, Electrification condition – d.c. traction contact systems (M16). Including Tables 3.34 – 3.35.
- 7.13.2 This is a condition measure for conductor rail contact systems, 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 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) and NR/ARM/M16PR (issue 4).
- 7.13.4 Audits were undertaken at Network Rail Headquarters and London North Eastern, London North Western and South East Territories. Scotland and Western Territories do not have conductor rail traction systems.

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 2007/08 was unchanged from 2006/07 at 1.9 which would again not meet the regulatory target.

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	00/01-03/04	00/01-04/05	00/01-05/06	00/01-06/07	00/01-07/08
Average Condition Score	1.8	1.9	1.8	1.9	1.9
% Surveyed	64%	68%	69%	70%	71%

Figure 7.13.1 Average condition of conductor rails (M16)

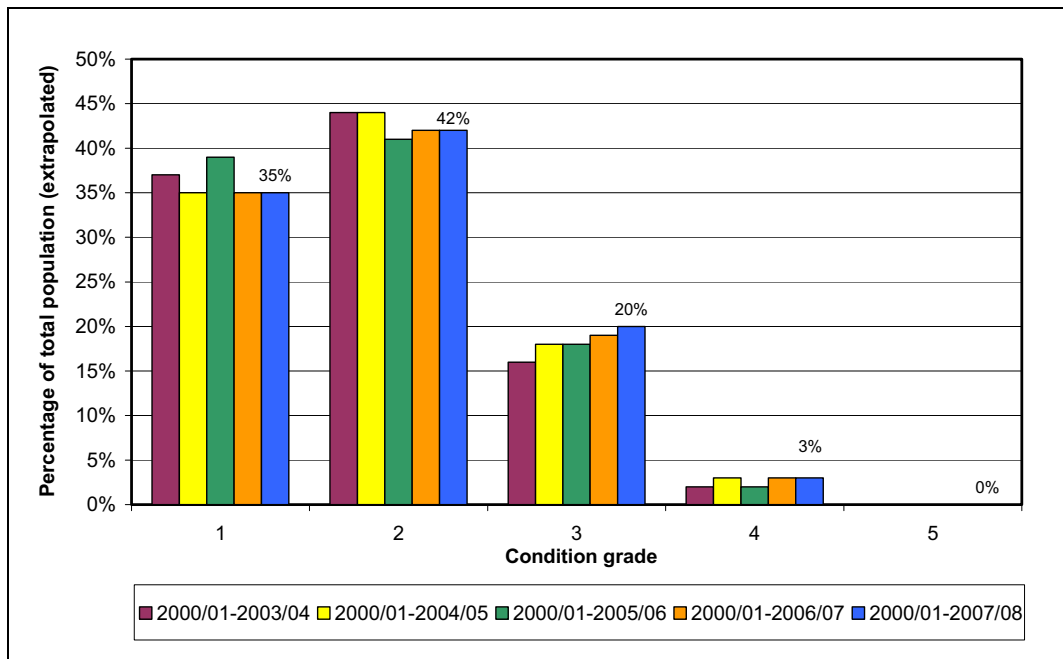


Figure 7.13.2 Average condition of conductor rails (M16)

Audit findings

Process

7.13.8 The definition and procedure have not been changed this year. 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. Measurements are entered into a standardised spreadsheet for storage by Territory personnel. The standardised spreadsheet contains:

- (a) Details of wear measurements undertaken in the current and previous years;
- (b) Lookup tables with standard wear rates, so that the current level of wear can be estimated from wear measurements corresponding to previous years;
- (c) Lookup tables with age estimates for particular levels of wear, so that the age of data can be back-calculated from the level of wear recorded; this is used when the date of a historic wear measurement has been lost;
- (d) Algorithms for calculating the condition grades from the wear measurements.

7.13.9 A reporting spreadsheet is administered by the Headquarters Business Planning Manager (E&P) for the Principal Engineer (Contact Systems). The reported data was subject to sign-off by the Territory E&P Engineers.

Accuracy of reported data

7.13.10 No data was reported this year by London North Eastern Territory, although it should be noted that they only have a very small area of conductor rail.

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

Developments

- 7.13.12 As mentioned in the last two year's audit reports, gaining access to the d.c. conductor rail to obtain data is a significant challenge for Network Rail, as manual gauging on live conductor rails is not justifiable under the Electricity at Work Regulations. To rectify this, a train-borne conductor rail gauging system has been developed to measure the position and cross-sectional profile of contact rails for wear calculations. This system has been integrated into the Southern Measurement Train (SMT).
- 7.13.13 The train is presently operational and the algorithms for conductor rail measurement are being validated. 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 should increase the reliability and accuracy of the 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.
- 7.13.14 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. Network Rail is confident however that changes they are implementing into the algorithm will resolve these issues in the near future.

Assessment of confidence grade

- 7.13.15 **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, as stipulated in the confidence grading guidance (Appendix D).
- 7.13.16 **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

- 7.13.17 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2008 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

- 7.13.18 We have no recommendations for this measure.

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

- 7.13.19 We have no observations for this measure.

Progress on outstanding recommendations from previous audit reports

- 7.13.20 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 2008, Section 3, Station Stewardship Measure (M17), including Tables 3.36 – 3.38.
- 7.14.2 During 2007/08 Network Rail have introduced the Station Stewardship Measure (SSM), which has replaced the previously reported Station Condition Index (SCI).
- 7.14.3 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 64 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 64 elements. The condition grades are integers from 1 to 5, where 1 is good condition and 5 is poor condition. Each of the 64 elements is weighted according to importance (and cost implications) of being 'suitable for safe and efficient operational use' of the station. The resulting station condition grades are then weighted and averaged to produce the overall SSM score for all stations. For 2007/08, the station weighting had not been agreed, and so each station was given the same weighting.
- 7.14.4 The definition and procedure for this new measure have not formally been documented. During the audits, we received draft copies of the Network Rail Asset Reporting Manual definition and procedure, documents NR/ARM/M17MN (issue 5) and NR/ARM/M17PR (Issue 7). However at the time of producing this final report, these had not been finalised and formally approved.
- 7.14.5 Audits were undertaken at Network Rail Headquarters, Network Rail's MP&I Office at Waterloo, the responsible consultants at South East, Western and London North Western Territories and Network Rail's appointed external auditor.

Commentary on reported data

- 7.14.6 Section 6.0 of the draft 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 figure has not been reported for 2007/08.

Regulatory target

- 7.14.7 The regulatory target for the station condition 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. As this is the first year the new SSM has been collected and no comparative measure has been provided, the 2007/08 reported condition can not be assessed against this regulatory target.

Trend

- 7.14.8 Figure 7.14.1 shows that the new SSM score is not comparable to the previous relatively steady trend of the SCI score.

Period	2003/04	2004/05	2005/06	2006/07	2007/08
Average SCI score	2.25	2.23	2.22	2.24	-
Average SSM score	-	-	-	-	2.71

Figure 7.14.1 Average condition of Stations (M17)

7.14.9 The percentage of stations achieving grades 1-5 (either SCI or SSM) across the entire network in the last 5 years is shown in Figure 7.14.2. It can be seen that the majority of the SSM results are Grade 3, where as for the SCI Grade 2 was more dominate.

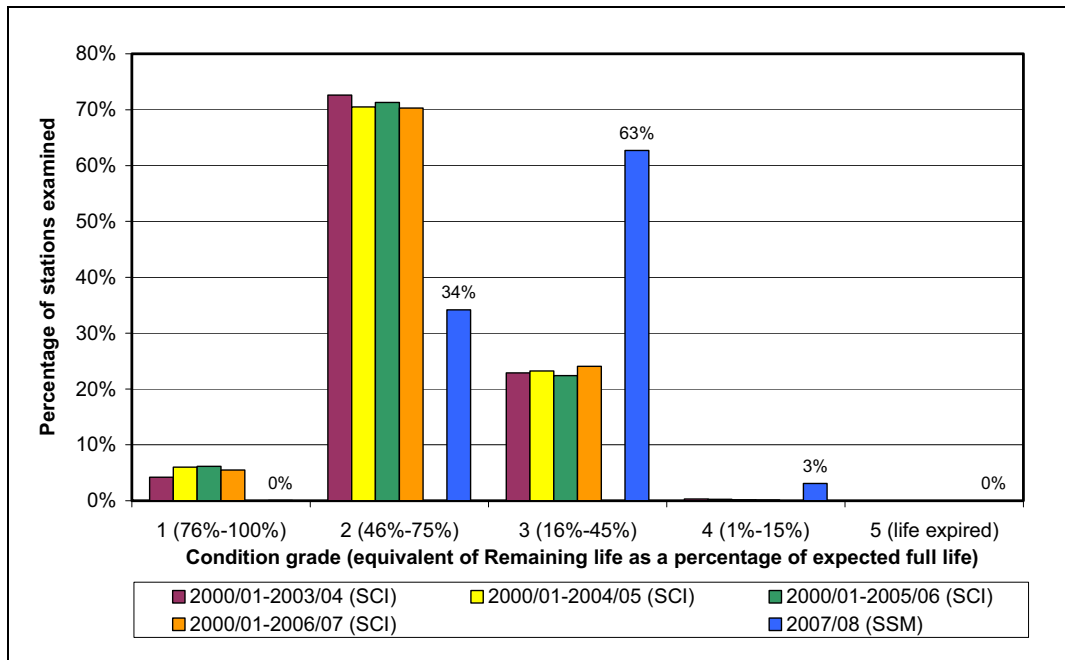


Figure 7.14.2 Station condition (either SCI or SSM) reported during the last five years (M17)

Audit findings

Definition

- 7.14.10 As a result of recommendations from previous years, there have been many significant changes to the measure during the last year. However, the necessary revisions to the definition and procedure documents have yet to be formalised and issued.
- 7.14.11 The new methods of data collection represent a significant improvement in efficiency, and major improvements in the training of inspectors and the QA process have also resulted. Great efforts have been made to make the measure more appropriate by a thorough review of the elements to be inspected, their expected lives, their relative importance, and also the relative importance of each station. However, the weightings to be applied to compute a final score are still under discussion between Network Rail and ORR.
- 7.14.12 These represent a significant improvement compared to the former Station Condition Index and address the majority of concerns expressed in previous years. However we do have the following remaining concerns with the definition of the new measure:
 - (a) We were initially informed that it was Network Rail's intended to continue the calculation of the SCI from the new data being collected for a period of time. This is reflected in the draft procedure, which states that a comparative measure is to be calculated for the remainder of CP3. However, we were advised in our final audit meeting that this comparative measure would not be provided. Reporting of this comparative measure is essential in assessing performance against the regulatory target and to allow trends to continue to be monitored until repeat data for the new measure is available.
 - (b) The new measure retains the system of condition grades based on a non-linear integer scale. While we can understand that arguments exist for both linear and non-linear distributions, we do not support the use of an integer scale which has the effect of 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.

Process

- 7.14.13 This year, overall responsibility for managing the collection of data for the measure has remained with Network Rail's Infrastructure Investment (NRIL) Group (formally MP&I), but the inspection results are now submitted directly to the System by the individual inspection consultants. Each Territory has an appointed consultancy company, who undertakes the station condition inspections. These consultants are procured and managed by NRIL.
- 7.14.14 During 2007/08 collection of data for this measure was integrated into the new Operation Property Asset System (OPAS), previously referred to as Atrium. This was populated by an initial survey programme named Atrium Data Collection Lite (ADCL) or OPAS Phase 1 in which data was collected which represented 80% of expenditure for all 1920 stations. A full 100% data survey was then undertaken on a 20% sample of stations (OPAS Phase 2) which formed the first year of a 5 year rolling programme of inspections.
- 7.14.15 As part of the rollout of the OPAS system, Network Rail conducted a 4 day training course for all surveyors and system administrators. This course was mandatory for users of the system and thus access was restricted to these attendees only. Additional training has been conducted as necessary.
- 7.14.16 At the initial audit meeting we were advised that the Annual Return 2008 would report on the 20% sample taken as part of OPAS Phase 2. Therefore our subsequent audit visits were focused on the process used for the more recent phase of the collection. We did note during these audits that the delivery of inspection reports into the system was behind schedule, which was needed in order to meet the required deadline for the production of the Annual Return. At our final audit meeting with the Headquarters champion we were advised that Phase 2 was not completed (still outstanding QA checks) and that the Phase 1 data would be used. Phase 1 data was also used to populate Network Rail's Strategic Business Plan.
- 7.14.17 A similar process was followed during both phases of the OPAS data collection. In general the consultant's surveyors would download a template for each station (or station block) prior to attending the site, and this was then filled out on site. To enable this data to filled out while on site, Network Rail introduced collection of data using handheld computers (PDA's) as part of OPAS Phase 1. We were advised that during Phase 2 a standalone data entry (SDE) system was also made available, which allowed data entry on a standard computer. This has rapidly becoming the preferred method of entry, as it offers a large screen and easier input functions. This has lead to a change in surveying practise for some of the consultants. Of the consultants audited, each had developed different methods for data collection and entry. These ranged from the intended data input on site using the PDA's or Tablet Laptops, to collection of data on paper for later input by the inspector or technical clerks using the SDE system.
- 7.14.18 Once the information is ready, it is uploaded to the OPAS system for validation checking. If the survey fails validation, an error report is produced which details the reasons why the survey did not pass. If these errors can be corrected, the survey will be re-uploaded with the corrections made. In some cases, the validation rule in OPAS is incorrect for that survey, an example of this is the validation rule that a platform end must have a ramp, but this isn't the case for all stations. In this case, the survey will be marked for "forced validation".
- 7.14.19 Once the survey has been validated the consultant takes the survey through their quality assurance (QA) process. This process varies by consultant, but in general involves a least one very through check of 100% of surveys. On top of the consultant's QA processes, Network Rail have also appointed an external auditor, WSP, who did audits on a 5% desk top and 5% site visit basis. The consultants submit the surveys for Network Rail's approval once they are assured by the consultant. The NRIL project manager then checks and approves these in the system ready for reporting.

7.14.20 To produce the figures for the Annual Return, the Headquarters' champion extracts the year's information from OPAS in to an access database and applies the element weightings and produces the summary tables for the Annual Return. We have been advised that in future, an algorithm will be developed within OPAS to automatically calculate the SSM score.

Accuracy of reported data

7.14.21 We reviewed the calculation within the Headquarters' database used to produce the numbers for the Final Annual Return. We found no errors and that the numbers reported in the Annual Return were correct.

7.14.22 During our audits of the consultants, we took a sample of surveys from the Phase 2 programme. However, due to Network Rail decision to report on the Phase 1 results, we've been unable to check these against the Headquarters' database, and thus the numbers being reported in the Annual Return.

7.14.23 The spread of SSM scores across the grades that has been reported by Territory is shown in Figure 7.14.3 below. It can be seen that there is a quite a difference in the dominate score band between the Territories. When asked, the Network Rail Headquarters' Champion was unable to provide a reason for this difference. This could be accurately reflecting the difference condition of each Territory's assets, but we do have concern that this could be a result of differing survey approaches or application of the Asset Remaining Life (ARL). We suggest that this difference needs to be investigated further and if these results are found to misrepresent the relative average conditions of the Territories' stations, then the cause for this discrepancy needs to be identified and rectified.

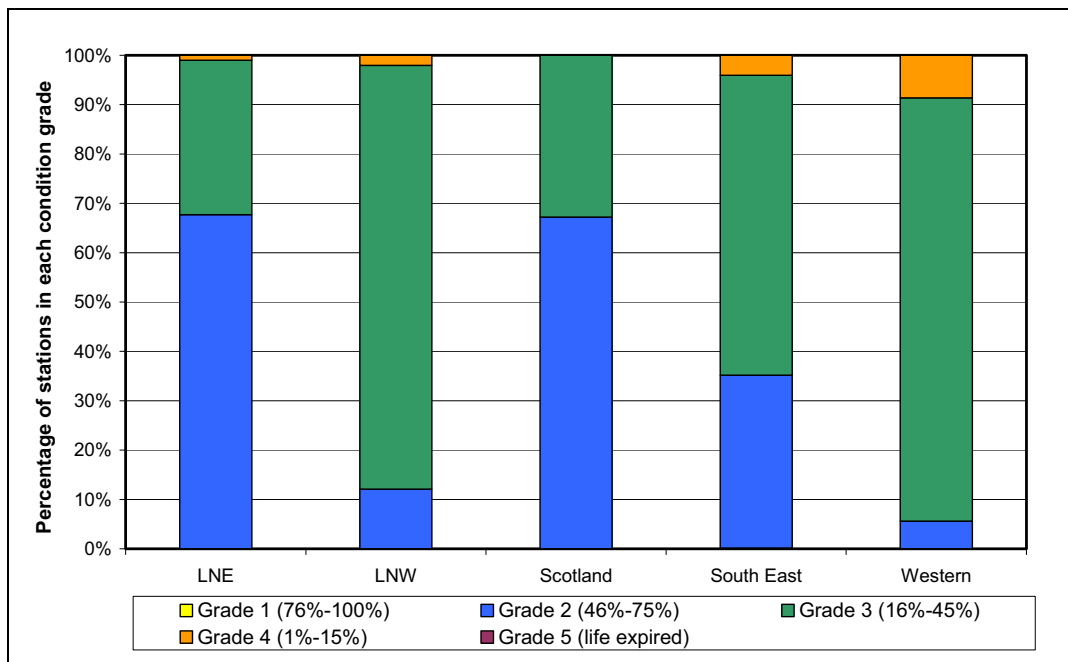


Figure 7.14.3 Spread of SSM Scores across grades by Territory (M17)

7.14.24 Network Rail appointed WSP to audit both phases of the OPAS surveys for 2007/08. We received a copy of the Final Audit report for Phase 2, dated 31 March 2008. Unfortunately, the audit was carried out too early compared to the completion of data collection and processing with the result that it was not possible for them to audit a random sample, and the distribution of stations audited across Territories was very uneven ranging from zero to 22. Similar problems had been experienced during their audit of Phase 1, for which the audit report, dated 15th February 2008, states that only 41% of surveys had been completed by 12/11/07 (by which date that should have been completed).

Assessment of confidence grade

7.14.25 **Reliability grade.** The definition for this measure is documented but has not been finalised or issued. The process for condition assessment is subjective. The defined scoring system is non-linear and ensures that averaged scores almost entirely falls in one of three scores. We believe that M17 should have a reliability grade of B.

7.14.26 **Accuracy grade.** We still have concerns regarding the subjective nature of this measure especially the application of asset remaining life; however we feel the programme of training courses has provided more consistency. We believe that M17 should have an accuracy grade of 3.

Audit Statements

7.14.27 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 and processed in accordance with the new procedures, however the documentation for this is still to be finalised and issued. The data has been assessed as having a confidence grade of B3. Achievement of the regulatory target for this measure can not be assessed.

Recommendations arising

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

7.14.28 **M17 recommendation 1.** We recommend that a comparative measure to the previous SCI be calculated for the remainder of CP3.

7.14.29 **M17 recommendation 2.** 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.

7.14.30 **M17 recommendation 3.** 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.

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

7.14.31 We have no observations for this measure.

Progress on outstanding recommendations from previous audit reports

7.14.32 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
2005-R40: 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. Current Status – Actioned and verified

Recommendations made	Progress update
<p>2005-R41: 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.</p>	<p>WSP has been appointed as an external auditor. Their audits have included site visits which assess the accuracy of the scoring attributed on site.</p> <p>Current Status – Actioned and verified</p>
<p>2005-R42: 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.</p> <p>Current Status – Actioned and verified</p>
<p>2006-R50: 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 address. There are however, still a number of these issues we still think are affecting this measure.</p> <p>Current Status – In progress</p>
<p>2006-R51: 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</p> <p>Current Status – Actioned and verified</p>
<p>2007-R29: If the use of MP&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.</p> <p>Current Status – In progress</p>
<p>2007-R30: 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.</p> <p>Current Status – Actioned and verified</p>
<p>2007-R31: 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.</p> <p>Current Status – Actioned and verified</p>

Figure 7.14.4 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 2008, Section 3, Light maintenance depot – condition index (M19), including Tables 3.39 – 3.40.
- 7.15.2 This measure assesses the average condition for each Light Maintenance Depot (LMD), using a methodology which provides a condition grade from 1 to 5, where 1 is good condition and 5 is poor condition. 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;
- 7.15.3 The definition and procedures for this measure are documented in the Network Rail Asset Reporting Manual, documents NR/ARM/M19DF (issue 3) and NR/ARM/M19PR (issue 4). There is also a supplementary manual, NR/ARM/M19MN (Issue 2).
- 7.15.4 Due to the imminent introduction of a revised condition measure for LMD, the audit for 2007/08 was focused only on the accuracy of the data, which was undertaken at Network Rail Headquarters.

Commentary on reported data

Regulatory target

- 7.15.5 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.
- 7.15.6 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.
- 7.15.7 In 2007/08, the average condition grade reported by Network Rail was 2.49, which would meet the regulatory target.

Trend

- 7.15.8 Figure 7.15.1 shows that the average LMD condition score has continually improved over the last 5 years, in which the percentage of depots inspected has approached 100% (based on a population of 89, as listed in the procedure).

Period	00/01-03/04	00/01-04/05	00/01-05/06	00/01-06/07	00/01-07/08
Average Condition Score	2.63	2.63	2.58	2.56	2.49
% of depot survey	46%	46%	64%	91%	96%

Figure 7.15.1 Average condition of LMD (M19)

7.15.9 Figure 7.15.2 shows the trend for asset condition. The results for 2007/08 have shown an increase in percentage of assets in condition grades 1 & 2, with decreases in the other condition grades, except grade 5 which has remained as zero percent.

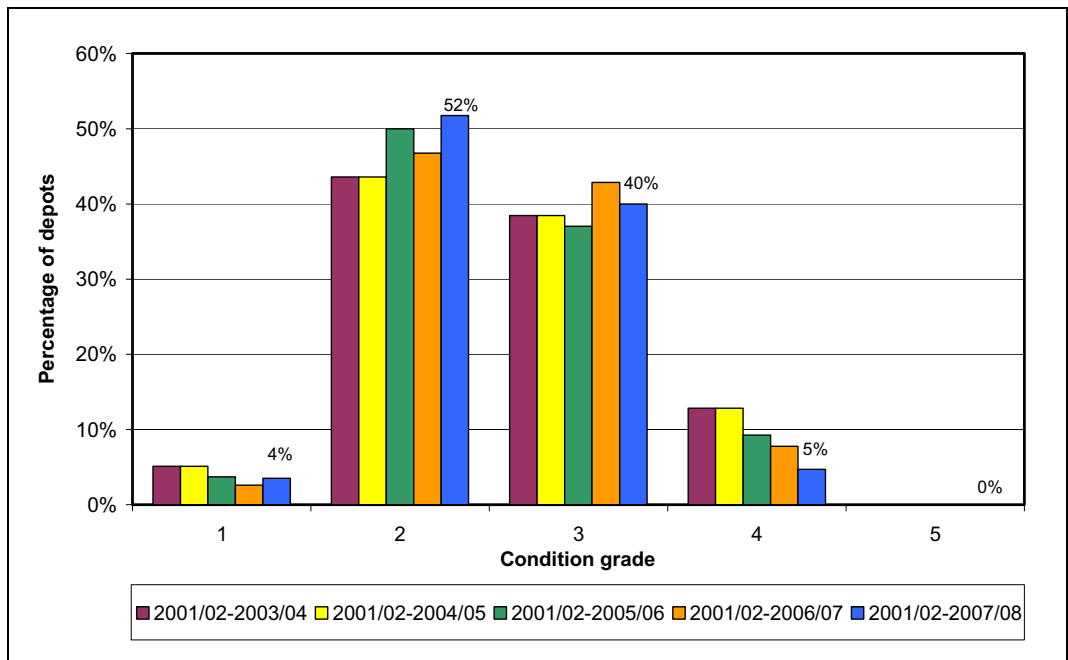


Figure 7.15.2 Average LMD asset condition (M19)

7.15.10 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.

7.15.11 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 eighth year of undertaking inspections; the condition of 85 LMD of the revised total population of 86 have been reported for year end 2007/08.

Audit Findings

Accuracy of reported data

7.15.12 Of the 13 inspections conducted, Headquarters received a full electronic copy of the reports; we verified that the data in the Headquarters database was correct for all the 2007/08 inspections reports. We also checked that the data within the Headquarters' database had been correctly reported in the Final Annual Return. All data was found to be correct.

Assessment of confidence grade

- 7.15.13 **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.
- 7.15.14 **Accuracy grade.** We found a few discrepancies in the reports for this measure which have minor impacts on the results. 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

- 7.15.15 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2008 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 has been met.

Recommendations arising

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

- 7.15.16 We have no recommendations for this measure.

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

- 7.15.17 We have no observations for this measure.

Progress on outstanding recommendations from previous audit reports

- 7.15.18 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
2005-R45: 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. Current status – Withdrawn
2005-R46: 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. Current status – In Progress
2006-R54: 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. Current status – Repeated in later year
2006-R55: 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.	We have been advised that the new measure for LMD will pick-up this recommendation. Current status – In Progress

Recommendations made	Progress update
<p>2007-R34: 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 have 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>Current status – In Progress</p>
<p>2007-R35: 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>Current status – In Progress</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 2008, Section 3, Network Rail Asset Stewardship Incentive Index (ASII), including Tables 3.41 – 3.42.
- 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 2007/08 result of 0.634 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.

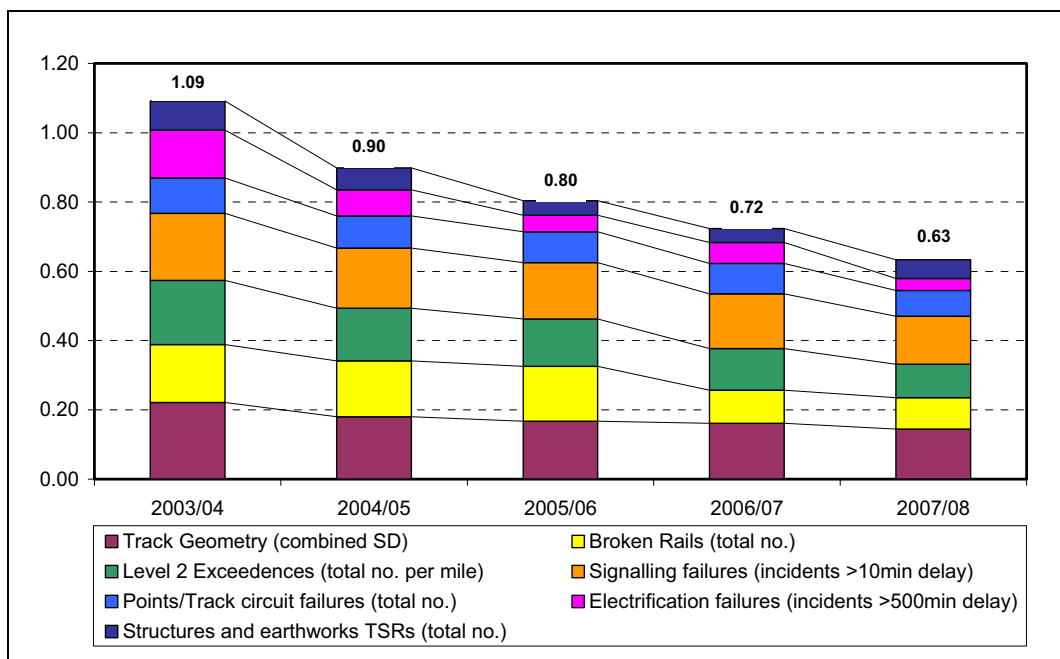


Figure 7.16.1 Asset Stewardship Incentive Index (ASII)

- 7.16.8 This year, Network Rail has reported a 12% 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 3.8; 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)	0.723	Index calculated using M3, Table 3.8
Broken rails (6.1)	181	Checked against M1, Table 3.1
Level 2 exceedences (6.2)	0.580	Checked against M5, Table 3.19
Signalling failures causing delay of 10min or more (6.3)	19,900	Checked against M9, Table 3.24
Points/ track circuit failures	14,367	Checked against Table 1.22
Traction power supply failures causing 500min delay or more (6.7 & 6.8)	72	Checked against M11, Table 3.28 Checked against M12, Table 3.29
Structures & earthworks temporary speed restrictions (6.5 & 6.6)	35	Checked against M4, Tables 3.17 & 3.18
Asset Stewardship Incentive Index	0.634	Index calculated, ASII, Table 3.41

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 14,367 does not match the figure of 14,382 reported in Table 1.22 of the Annual Return. This minor discrepancy does not have a material affect on the overall ASII value of 0.634.

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 2008. 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 2008 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 2008, Section 4, 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 undertaken at Network Rail’s Infrastructure Investments (II) track renewals team. For West Coast Route Modernisation (WCRM) and maintenance delivered projects we confirmed that there had been no change in the data collation procedure from 2006/07. For II delivered projects, we also undertook audits in two Territories, London North Eastern and London North Western.

Commentary on reported data

Regulatory targets

8.1.4 There are no regulatory targets for these measures.

Trend

8.1.5 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. Non-WCRM rail renewals increased between 2004/05 and 2005/06, but have been falling over the last three years.

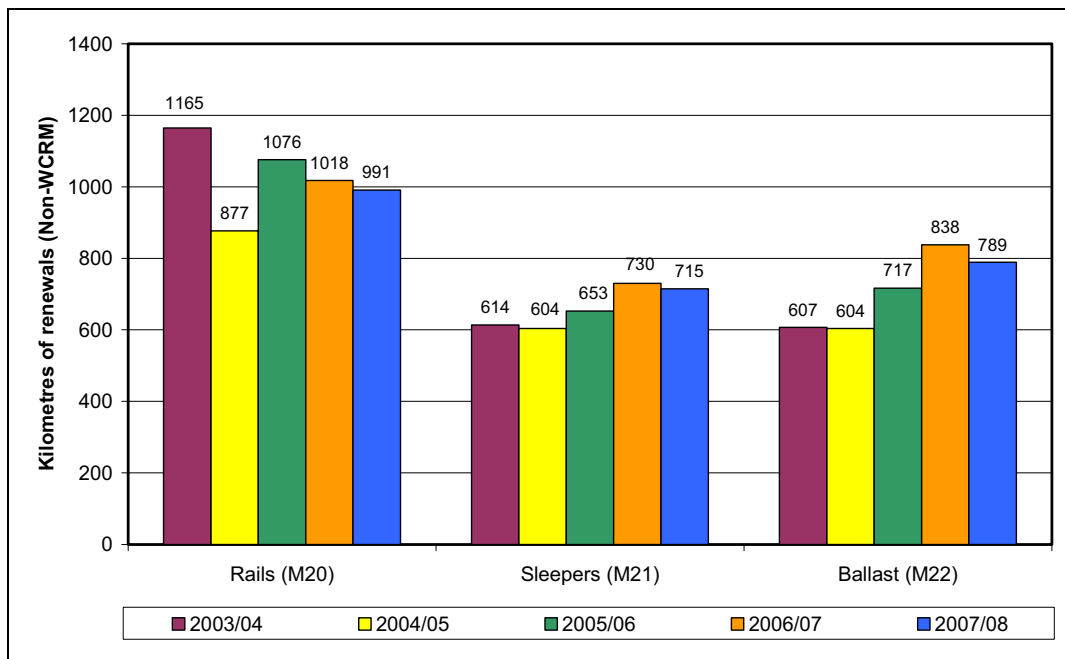


Figure 8.1.1 Track renewal volumes excl. WCRM (M20, M21, M22)

8.1.6 Figure 8.1.2 shows non-WCRM full S&C renewals have risen by 59% over the last five years but declined by 11% in 2007/08. The changes have resulted from a change in Network Rail's asset management practices for S&C over this 5-year period.

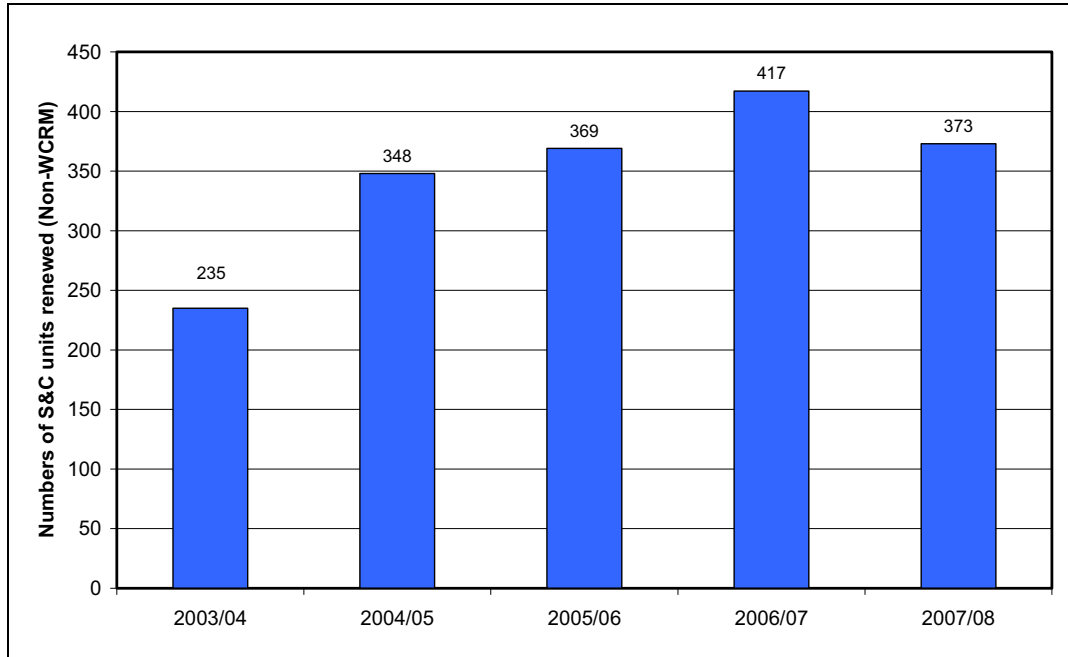


Figure 8.1.2 Switch and crossing full renewals excl. WCRM (M25)

8.1.7 Figure 8.1.3 shows the non-WCRM S&C renewals by type of renewals undertaken over the last 5 years. The last year saw a slight fall in the reported number of removals/recoveries works as compared to the previous year. However there was an increase in partial renewals/reballasting.

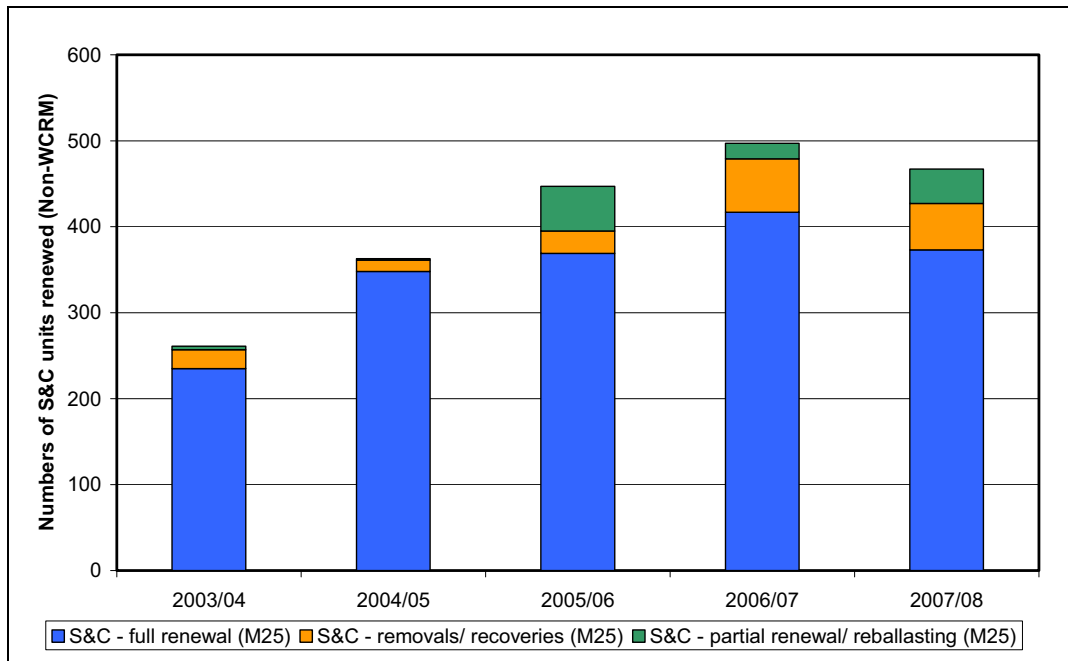


Figure 8.1.3 Switch and crossing renewal excl. WCRM by type (M25)

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 in York collate the Annual Return data from the MBR reports.
- 8.1.10 Each report has a summary page, which summarises year-to-date renewals of rail, sleepers, ballast and S&C, in terms of both cost and volumes. However the MBR report does not disaggregate the sleepers or ballast data by category. These are split in accordance with defined category rules.
- 8.1.11 For II delivered projects, the Senior Planner Track in York was requested to extract the total renewals volumes by Territory from P3e, and these were compared to the volumes reported (which were compiled from the MBR packs). Some discrepancies were found between these numbers.
- 8.1.12 We undertook audits of individual schemes from 2 Territories, London North East and London North West. In both Territories, on completion of a renewals work the contractor prepares a GEOGIS 'Construction Details' report which is sent to the Programme Controls Manager. When the follow-up work has been completed a 'Correlation' drawing is prepared. The Network Rail Site Manager checks the GEOGIS report against the 'Correlation' drawing before it is submitted for input into the P3e database.

West Coast Route Modernisation track renewals

- 8.1.13 Each week renewals volumes are entered into the WCRM Project Control System (PCS) database by project teams using 97 unique WCRM activity codes which align with the WCRM cost control system. There are currently around 40-50 project teams on the West Coast project. The data entered into PCS is verified by West Coast Engineering, Project Controls Managers, and the Project Manager.
- 8.1.14 For the track renewals measures, the WCRM Performance Measurement Manager used bespoke queried to collate the appropriate data from PCS.

Maintenance delivered track renewals

- 8.1.15 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 Headquarters 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

- 8.1.16 We checked the P3e database and the processes used to consolidate all the information for reporting purposes, and found this to be correct.
- 8.1.17 However there were discrepancies between the total renewals volumes by Territory between those extracted from the P3e database and those compiled from the MBR packs. There are minor differences between individual Territories, ranging from -4% to 3% for plain line works, and -1% to 8% for S&C works.
- 8.1.18 We undertook site visits to London North Eastern and London North Western and found no major errors in that data reported into P3e for the individual schemes audited.

- 8.1.19 During the audit of London North Eastern, Network Rail explained that the need to over plan renewals has been reviewed and only the compliant volumes of plain line renewal are now programmed. The volumes of plain line associated with S&C renewals are now captured and this volume (which is declared as before) is now generally larger and makes up for the shortfall of compliant plain line volumes that are lost due to changes to the programme, cancellations, curtailments etc. This has been possible due to a more focussed reporting process for plain line associated with S&C.
- 8.1.20 During the audit of London North Eastern it was noted that the practice of reporting ramping in and out as reballasting volume was not consistently applied.

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 changed since last year.

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 has been reported by the II teams based on the MBR Reports, however minor discrepancies have been found between this data and the summary volumes extracted from the P3e database. No errors were found in the P3e data for a sample of projects in London North Eastern and London North Western. 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 2007/08 for the track renewals measures (M20, M21, M22, M25). 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. There are no regulatory targets for these measures.

Recommendations arising

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

- 8.1.25 **M20-M22, M25 Recommendation 1.** We recommend that Network Rail investigates why the volume data extracted from the P3e database differs from that reported in the MBR packs.
- 8.1.26 **M20-M22, M25 Recommendation 2.** We recommend that Network Rail ensures that the practice of reporting ramping in and out of reballasting volume needs to consistently applied and only taken as credit if it is a full reballasting to formation level.

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

- 8.1.27 We have no observations for this measure.

Progress on outstanding recommendations from previous audit reports

- 8.1.28 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:

Recommendations made	Progress update
2007-R36: The PCS database should be modified to classify S&C renewals as 'full' and 'partial' renewals separately.	As the WCRM project is coming to an end this recommendation is no longer applicable. Current Status – Withdrawn

Recommendations made	Progress update
<p>2007-R37: Network Rail should investigate why for South East Territory, when volumes for individual depots (from P3e) were aggregated, they did not correspond accurately to the totals for South East Territory obtained from the MBR reports, and remedy the discrepancy.</p>	<p>Network Rail have changed the process for data consolidation and thus this recommendation is no longer relevant. Current Status – Withdrawn</p>
<p>2007-R38: We recommend that Scotland Territory take steps to ensure that data is accurately entered into P3e.</p>	<p>Network Rail have advised that has been corrected, however our audits did not cover Scotland Territory this year and so this is still to be verified. Current Status – Actioned Awaiting Verification</p>

Figure 8.1.4 Progress on outstanding recommendations for track renewals measures (M20, M21, M22, M25)

8.2 Signalling Renewed (M24)

Audit scope

- 8.2.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2008, 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 and procedures for this measure are documented in the Network Rail Asset Reporting Manual, documents NR/ARM/M24DF (issue 5) and NR/ARM/M24PR (issue 2), 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 Headquarters and at the STPE Design Office in Reading. We also obtained signalling plans and statistics for 3 schemes covering London North Eastern, London North Western and South East Territories.

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 significant increase in the number of SEU renewed in 2007/08 as compared to the previous reporting period. A total of 1,441 SEU were reported as being renewed as compared to the Network Rail Business Plan target of 924. This represented an increase of nearly 200% compared to 2006/07. As stated in the Annual Return, the delay to the scheme at Portsmouth in last years programme resulted in 287 SEUs being commissioned in 2007/08 rather than 2006/07 as planned.

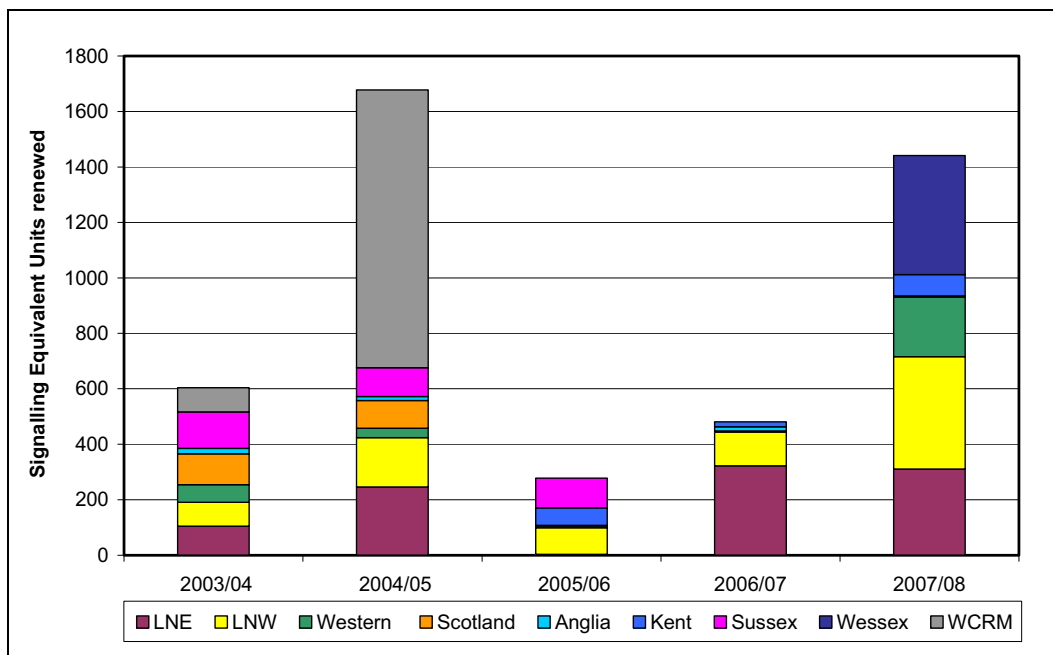


Figure 8.2.1 Signalling renewals (M24)

Audit findings

Definition

- 8.2.7 During our Audit Network Rail stated that they now reported on SEU volumes using the definition given in NR/ARM/M24DF where the weighting applied to the categories of renewals are:
- (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 Territories. 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 Headquarters team to account for partial renewals in accordance with NR/ARM/M24DF.

Accuracy of data reported

- 8.2.9 The P3e database output was viewed at the STPE Design Office in Reading. We also looked at how data is input into P3e.
- 8.2.10 A sample of 3 projects (one each from South East, London North Eastern and London North Western) were selected for a more detailed audit with the project teams at in the Territories. For all the schemes the number of SEU in the scheme plan matched those in the P3e database.

Assessment of confidence grade

- 8.2.11 **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 Headquarters 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.
- 8.2.12 **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. We believe M24 should have an accuracy grade of 3.

Audit Statement

- 8.2.13 We have audited the reliability and accuracy of the available data and commentary for Signalling Renewed (M24). 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 C3. There is no regulatory target for this measure.

Recommendations arising

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

- 8.2.14 We have no recommendations for this measure.

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

- 8.2.15 We have no observations for this measure.

Progress on outstanding recommendations from previous audit reports

8.2.16 We set out below our assessment on the current progress of Network Rail in addressing our outstanding recommendations for Signalling Renewed (M24) from our previous Audits:

Recommendations made	Progress update
<p>2006-R57: We recommend a revised method of measuring signalling renewals is agreed with ORR and Independent Reporter.</p>	<p>Revised ARM issued Feb 2008 Current status – Actioned & Verified</p>
<p>2006-R58: We recommend the procedure is revised to include an internal audit by Headquarters to be undertaken annually on a sample basis.</p>	<p>The Network Rail business management processes use the SEU count as one of the bases for project development and monitoring. It is a robust process. There is no internal audit but as the SEU count is subject to challenge and analysis at each project stage gateway as part of the Network Rail business process. Current status – Withdrawn</p>
<p>2007-R39: It was apparent from our meetings at Network Rail that the Champion identified for this measure did not deal with this matter directly. We recommend that Network Rail ensure that the Champion's for this and other measures do relate to the measure directly.</p>	<p>Network Rail's Champion this year had full knowledge and involvement with the measure. Current status – Actioned and Verified</p>
<p>2007-R40: We recommend the procedure for this measure is revised to reflect the new reporting process in use and update the assigned responsibilities for this measure.</p>	<p>Revised ARM issued Feb 2008. This document makes reference to Territories and it is understood that the proposed re-organisation will remove Territories as separate entities. This ARM along with many others will need to refer to the relevant posts in the revised organisation. Current status – Withdrawn</p>

Figure 8.2.2 Progress on outstanding recommendations for Signalling Renewed (M24)

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 2008, 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 Table 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. In addition, areas of bridge works are reported as part of M23 and areas of retaining wall works are reported as part of M27.
- 8.3.3 The definitions and procedure for these measures are documented in:
- (a) NR/ARM/M23DF (issue 3);
 - (b) NR/ARM/M26DF (issue 2);
 - (c) NR/ARM/M27DF (issue 3);
 - (d) NR/ARM/M28DF (issue 1);
 - (e) NR/ARM/M29DF (issue 1);
 - (f) NR/ARM/M23PR (issue 1).
- 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 Infrastructure Investments team in Swindon, as well as with the Civils Renewals teams at South East and London North Western Territories.

Commentary on reported data

Regulatory targets

- 8.3.5 There are no regulatory targets for these measures.

Trend

- 8.3.6 Whilst Network Rail have reported activity volumes for each of the six measures, our audit findings conclude that the information presented is inaccurate as it includes quantities from the Business Plan where CAF returns are unavailable. This information does not necessarily align with actual renewal values. Figure 8.3.1 shows the proportion of projects reported from CAF and the Business Plan for each of the measures within the values reported in the Annual Return.
- 8.3.7 We therefore offer no commentary on the figures provided by Network Rail.

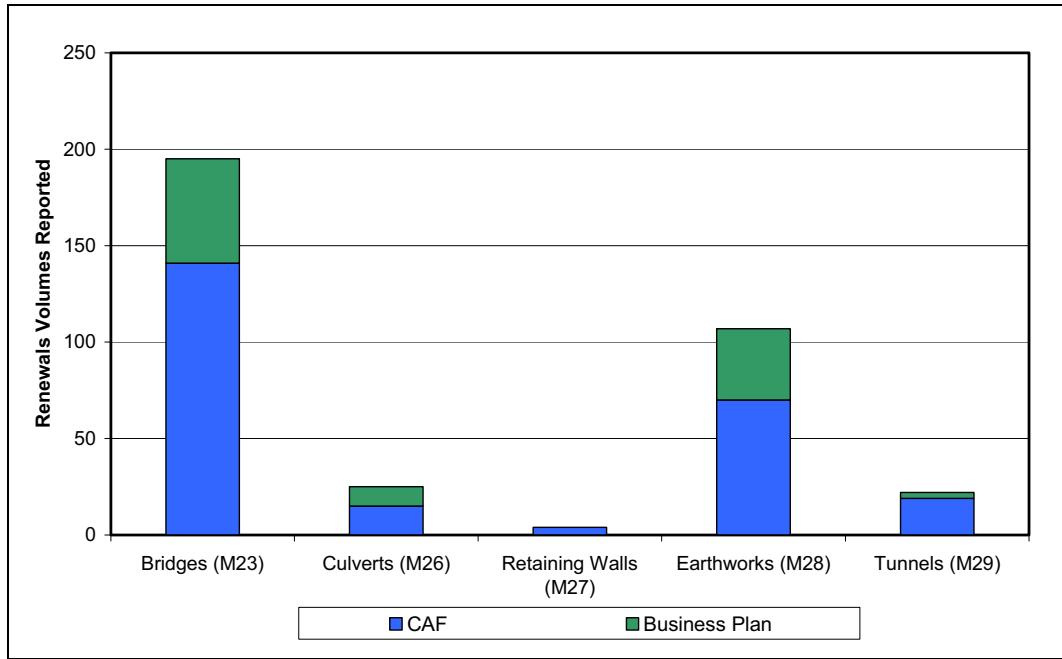


Figure 8.3.1 Number of renewal volumes reported from CAF and the Business Plan in Annual Return 2008 (M23,M26-M29)

Audit findings

Process

- 8.3.8 Our audit identified considerable under-reporting of activity volumes on a Territory basis.
- 8.3.9 The Network Rail Territories determine renewals activities and these should be reported into the CAF database at specific points in the lifecycle of each project. The CAF database is then interrogated by the Programme Efficiency Analyst to produce data for the Annual Return measures. The Annual Return therefore depends heavily on the Territories to complete the CAF returns.
- 8.3.10 Our expectation was that the volume activities in each Territory should have been broadly similar, given that the Territories are of broadly similar asset population and that structural factors are not significant. Analysis of the 2007/08 data provided by Network Rail indicated significant volumes of activity in London North Western and London North Eastern Territories but little or no activity in Western, South East, and Scotland. Figure 8.3.2 illustrates the disparity between Territories for the 2007/08 return. South East accounts for only 3% of the returns:

	Bridges	Culverts	Retaining Walls	Earthworks	Tunnels	Total	Proportion
	M23	M26	M27	M28	M29		
LNE	62	2	1	25	9	99	42.7%
LNW	47	3	2	19	3	74	31.9%
SEA	7	0	0	0	0	7	3.0%
Western	10	4	1	7	1	23	9.9%
Scotland	16	0	2	9	2	29	12.5%
	142	9	6	60	15	232	

Figure 8.3.2 Activity volumes by Territory for 2007/08 (excluding business plan volumes)

- 8.3.11 We then undertook specific audits in London North Western and South East to understand why there were such differences in activity volumes. We also consulted the respective Territory Structures Engineers (TSE) and Territory Geotechnical Engineers (TGE), in order to gauge their assessment of the volumes. The TSEs and TGEs are effectively the sponsors and budget holders for the renewal activities.
- 8.3.12 Renewal works above the measure thresholds are generally undertaken by renewals framework contractors, of which there are one or two per Territory. Some works over the threshold could also be undertaken by minor works contractors and some larger works are undertaken through competitive tender. The audit of the two Territories confirmed that a significant proportion (circa 90%) of projects were being delivered by the framework contractors.
- 8.3.13 In London North Western the framework contractor (Birse) completes the CAF return form for the project. This CAF reporting activity forms part of their contract KPI. Our audit of London North Western Territory was broadly satisfied that the activity volumes presented were correct. The volumes being reported were broadly in-line with those anticipated by the Network Rail sponsors.
- 8.3.14 In South East, there are two framework contractors (Nuttall and Kier). Our audit established that Network Rail had not been able to agree the KPI regime with either contractor. As a consequence, neither contractor was preparing CAF returns. The onus then fell upon the Network Rail quantity surveyors to prepare and complete the CAF returns. Our audit established, that due to a combination of competing priorities and staff shortages, the CAF returns were not generally being completed. Consequently the Annual Return was heavily under-reported for South East Territory. This under reporting was confirmed by the Network Rail sponsors, who did not recognise the very small amount of activity volumes. The sponsors confirmed that significantly higher volumes should have been reported.
- 8.3.15 For bridges and retaining walls, additional deck areas and wall area quantities are recorded as part of the M23 and M27 measures. Our audit of London North Western found these areas to have been calculated correctly. In South East, there were a very limited number of projects to review. Of the three South East projects reviewed, two were found to have areas broadly correct. Network Rail was unable to provide area information for the third (Victoria Road Footbridge).
- 8.3.16 In previous years we had observed inconsistencies in the way in which walkways were considered while calculating total deck areas of bridges renewed. Network Rail have now produced a "Cost and Volume" booklet for each asset type giving a definition and guidance of how quantities of work done should be measured. This has proved to be very useful in providing clear guidance to Territories and improved data quality.

Accuracy of reported data

- 8.3.17 By examination of the volume tables provided by Network Rail, we would reasonably conclude that volumes in Scotland, South East and Western Territories are significantly under-reported. Volumes for London North Western and London North Eastern are more credible.
- 8.3.18 Network Rail have accepted that there is a fundamental problem with the CAF data collection process. To this extent, they have sought to supplement the 2007/08 figures with expected volumes from their business plan. We do not consider this to be acceptable. We have therefore determined not to analyse the data further.
- 8.3.19 Network Rail informed us that the business plan document was a live one, and was constantly updated as and when projects were completed. Hence they believed that business plan data could be used as a proxy for CAF data. We have however not seen any evidence of this or have we audited the business plan. Further use of the business plan data for reporting is not as per the agreed procedure.

8.3.20 The data in CAF is used to determine Network Rail’s unit cost rates. We would conclude that cost rate information in CAF is disproportionately weighted from projects in the north of England, where overall costs might reasonably be assumed to be lower than in the south.

Assessment of confidence grade

8.3.21 **Reliability grade.** The definitions for these five measures are clearly documented. However, the process has not been followed and data has been extrapolated from a limited sample of CAF data. Hence we therefore conclude that the measures M23, M26, M27, M28, and M29 should have a reliability grade of C.

8.3.22 **Accuracy grade.** We believe that the measures M23, M26, M27, M28, and M29 should have an accuracy grade of 3.

Audit Statements

8.3.23 We have audited the reliability and accuracy of data and commentary presented in Network Rail’s Annual Return 2008 for civils renewals and remediation measures (M23, M26, M27, M28 and M29). We confirm the data has not 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 C3. There are no regulatory targets for these measures.

Recommendations arising

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

8.3.24 **M23&M26-M29 recommendation 1.** Network Rail should review the process by which CAFs form are completed at a Territory level. We recommend that framework contractors be instructed to prepare the CAF form as part of their duties and that this forms part of their Key Performance Indicators.

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

8.3.25 We have no observations for this measure.

Progress on outstanding recommendations from previous audit reports

8.3.26 We set out below our assessment on the current progress of Network Rail in addressing our outstanding recommendations for civils renewals and remediation measures (M23, M26, M27, M28 and M29) from our previous Audits:

Recommendations made	Progress update
<p>2007-R41: We recommend that Network Rail develops a revised definition and procedures for these measures. This to include a consistent policy of whether or not to include walkways while reporting bridge deck area renewed Also when square areas are entered into CAF, a record is made of which drawings there areas have been derived from.</p>	<p>Network Rail have produced a “Cost and Volume” booklet for each asset type giving a definition and guidance of how quantities of work done should be measured. Current Status – Actioned and Verified</p>
<p>2007-R42: We recommend that CAF should indicate why any significant changes to volumes have taken place in relation to the business plan.</p>	<p>Network Rail partially accepts this recommendation, but state that they are unable to include this information on the CAF form. They have asserted that they can provide scheme specific change forms to explain significant changes to volumes. Current Status – In progress</p>

Figure 8.3.3 Progress on outstanding recommendations for civils renewals and remediation measures (M23, M26- M29)

9 Audit report and commentary – Safety and Environment

9.1 Safety

Audit scope

- 9.1.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2008, Section 5, Safety and Environment, including Tables 5.1 – 5.6.
- 9.1.2 The measure reports on the principal Safety KPIs, namely:
- (a) Workforce safety – Workforce accident frequency rate. This measure records Network Rail's performance in terms of the number of personal accidents (excluding those not resulting in personal injury) defined as reportable under RIDDOR. The rate is normalised per 100,000 hours worked.
 - (b) System safety – Infrastructure failures. This records the number of failures of infrastructure with a risk ranking of 50 or over – this includes, for example, failures of signalling equipment where a signal reverts to green when it should be at danger.
 - (c) System safety – Level crossing misuse. This measure records all significant safety related incidents on level crossings, measured as occurrences of trains striking or experiencing a near miss with vehicles or pedestrians, and normalised by the number of crossings.
 - (d) System safety - Category A SPADs. A Category A SPAD occurs when a signal is passed while displaying a stop aspect, despite the signal being correctly set in time for the train to have stopped; these are incidents that could potentially have led to a collision.
 - (e) System safety - Operating irregularities. This measure reports on the number of reported irregularities (that is incidents, categorised as such within SMIS) normalised by the number of signals, train miles and track miles.
 - (f) Criminal damage. This is the number of malicious acts on or directly affecting Network Rail infrastructure, normalised per 100 route miles.
- 9.1.3 The definition and procedures for this measure are documented in Network Rail's Corporate KPI Manual.
- 9.1.4 Audits were undertaken at Network Rail Headquarters, with supplementary audits on two Network Rail Routes. This is the first year that this Area has been subject to audit as part of the Annual Return process.

Commentary on reported data

Regulatory target

- 9.1.5 There are no specific regulatory targets for these measures, although there is a general requirement on Network Rail to deliver year on year improvements in safety.

Trends

- 9.1.6 **Workforce Safety - Accident Frequency Rate.** The Accident Frequency Rate for Network Rail employees and contractors for 2007/08 was 0.226. This is a 14% reduction over the figure reported in 2006/07 which was itself an improvement over the previous year.
- 9.1.7 **System Safety - Infrastructure Wrong Side Failures.** Overall, the number of higher risk failures has fallen by 4.7% over the year, and by 20% over the past 2 years. Improvement has been driven largely by a reduction in the number of higher risk signals and telecoms failures, down from 13 in 2006/07 to 5 in 2007/08, although track incidents have risen from 36 to 44 over the same period.

- 9.1.8 **System Safety – Level Crossings.** Over the year 2007/08 the Moving Annual Average for level crossing misuse (measured as equivalent collisions) has risen from 26.38 to 28.46 although this is still below the MAA of 32.23 recorded in 2005/06. The level of actual collisions (car and pedestrian) is 16, the same as in 2006/07, with the overall increase occurring as a result in the rise of reported near misses.
- 9.1.9 **System Safety – Signals Passed at Danger.** The number of Category A SPADs increased in 2007/08 by a factor of 6% over the 2006/07 figure and 8% over that for 2005/06. Nevertheless, incidents remain at a low base – just 0.614 incidents occurred per 1,000 signals during 2005/06.
- 9.1.10 **System Safety – Operating Irregularities.** The number of Operating Irregularities rose slightly during 2007/08 with the results for the year showing a 1.6% increase over results for 2006/07. However, this was still a 15.2% reduction on 2005/06 figures. The majority of incidents arise as a result of wrong routings by signallers.
- 9.1.11 **System Safety – Criminal damage (malicious acts).** Performance against this measure shows significant improvement over the 2006/07 position, with the number of absolute incidents reducing 10.3%. When weighted against train miles, the improvement is even greater, representing an 11.8% improvement year on year.

Audit findings

Process

- 9.1.12 Railway Group Standard GE/RT8047, “Reporting of Safety Related Information”, gives clear instructions and guidance on incidents to be entered, and mandates the reporting system.
- 9.1.13 The principal data source for many of the measures is the Safety Management Incident System (SMIS). The SMIS is further detailed in section 9.1.30 below.

Accident Frequency Rate.

- 9.1.14 This is calculated as the number of RIDDOR reportable incidents per 100,000 hours worked by ground level staff. The definition of RIDDOR reportable incidents used for the measure is taken from the HSE Guide to the Reporting of Injuries, Diseases and Dangerous Occurrence Regulations 1995 (RIDDOR 95). Additional guidance is available on-line from RSSB. SMIS entries reference categorise incidents as reportable/non-reportable under RIDDOR. Where reportable, reference is input to the specific paragraph of RIDDOR 95 under which it is reportable.
- 9.1.15 There is a small amount of variation from previous indicator measures run by RSSB – this arises as a result of TOC data now being left out of the measure.
- 9.1.16 Figure 9.1.1 below illustrates the dataflow within one Route for reporting the source data used to produce the number of incidents data that forms the basis for the calculation of this KPI. Although the process varies slightly between KPIs and Routes, the broad principles of information transferring from Control logs and/or other sources via manual intervention into SMIS and then into SID remains broadly the same across all the KPIs reported on here.
- 9.1.17 Figure 9.1.1 illustrates how the data is subject to a high level of manual inputting and transfer.

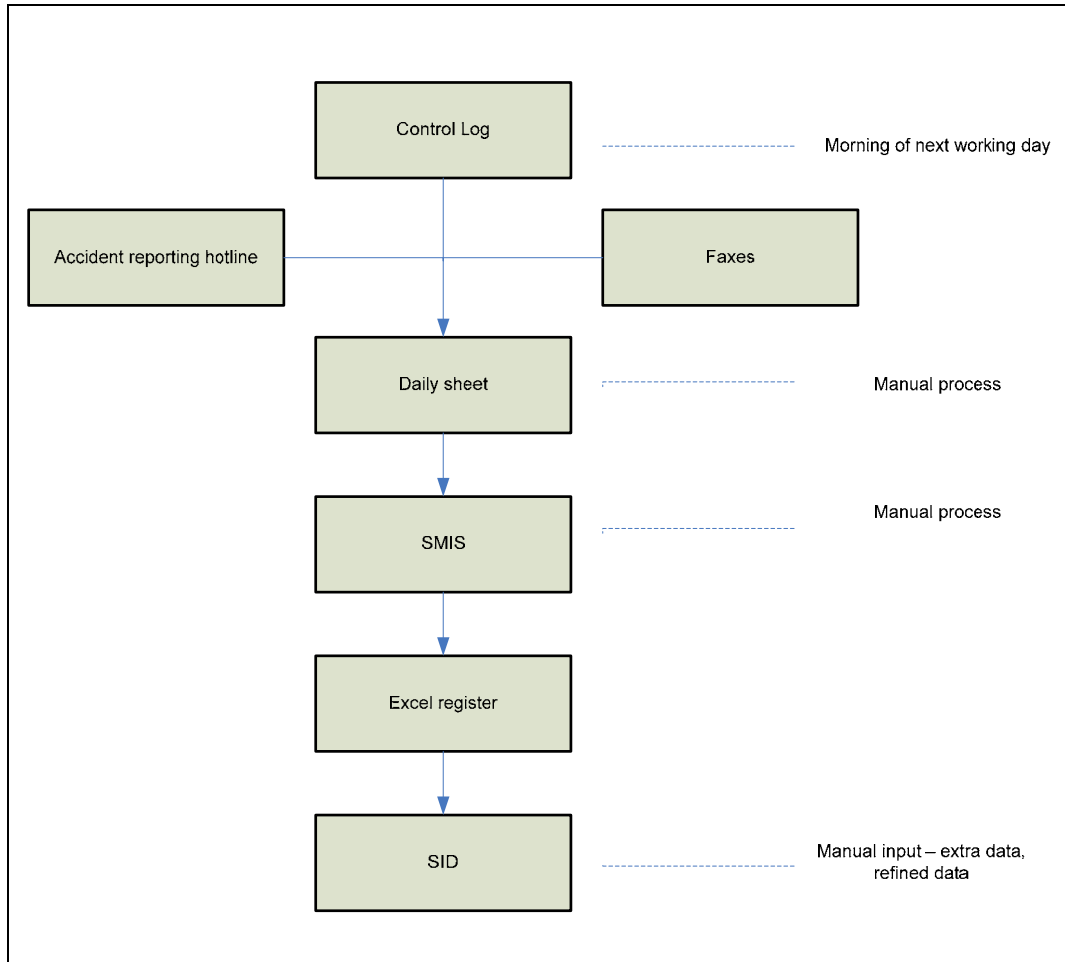


Figure 9.1.1 Data flow for reporting (Safety)

- 9.1.18 In terms of SMIS data entry, the SMIS events matrix gives clear guidance on the categorisation of events. This is additionally supported through the SMIS help pages. Procedures for data entry are mandatory under Network Rail’s working instructions. In terms of categorising the seriousness of incidents, clear guidance is published by at least one Territory (Southeastern: Guidance Note ABP09: Investigation of Accidents & Incidents Matrix).
- 9.1.19 The other component of the RIDDOR KPI is hours worked data. Routes enter hours for operations and maintenance staff into SID, from where it is drawn down by those preparing reports at Headquarters level. Hours for project staff are manually input by the Headquarters team.

Level Crossing Safety KPI.

- 9.1.20 Up until 2007 this figure included level crossing misuse. However, Network Rail’s Safety team had concerns that it was difficult to measure the latter factor in a robust way. The measure for 2007/08 has therefore been changed to include significant events only. Analysis of historic SMIS data has been undertaken by Network Rail to establish a two-year data set enabling relevant comparisons to be made. The internal target set by Network Rail for 2007/08 was for no more than 26.3 events.
- 9.1.21 Reporting of the KPI in SEAR has been refined during 2007/08, with a separation of “level crossing misuse” into component parts i.e.:
- (a) train striking road vehicle;
 - (b) train near miss with road vehicle;

- (c) train striking pedestrian;
- (d) near misses with non vehicle users.

9.1.22 Near miss data is drawn from SMIS, with the number of level crossings being drawn directly from ELLIPSE.

Infrastructure wrong side failures.

9.1.23 This measure uses a risk ranking process outlined in company standards to identify all failures with a risk severity score of more than 50. The risk assessment has to be countersigned by the responsible engineers to say they agree with the ranking, ensuring a check on the analysis of the level of severity of an incident. No specific target is set for this measure of which source data is drawn from the FMS and SINCS systems.

Category A SPADs.

9.1.24 The target for this measure is for a maximum of 328 in a year. Source data for the measure is drawn from SMIS and CCL (number of incidents) and from ELLIPSE (number of signals).

Operating irregularities measure.

9.1.25 No specific target is set for this measure, the source data for which is drawn from GEOGIS (number of signals/track miles) and Paladin (train miles). A new risk ranking tool has been developed for use 2009 onwards which could help to improve the relevance of the measure.

Malicious acts (vandalism).

9.1.26 The source data for this is drawn from SMIS (number of incidents) and GEOGIS (route miles). Network Rail's target is for no more than 5.95 acts per 100 route miles.

Target setting.

9.1.27 Targets are based on a review of the previous year's performance, looking at associated risk levels and identifying mitigations. The latter are then built into the following year's business plan (subject to approval from Tactical Safety Group and the Strategic Safety Group). Targets are published in the Business Plan and monitored through SEAR, which reports on all corporate and functional KPIs. It should be noted that the aim of the targets is to encourage positive behaviour (ie the reporting of incidents), rather than under-reporting.

Reporting.

9.1.28 Each period, a SEAR report is produced by the Headquarters team, based on data supplied by RSPSs (largely through the SID). In compiling the SEAR, the responsible team undertake "sense" checks as well as cross checking against source data to ensure that reports are as accurate and up to date as possible. The year to date figures from the Period 13 SEAR report are used as the base figures for the Annual Return, subject to further cross-checks and updates. Note: infrastructure wrong side failures are reported a period behind – this means the Period 13 SEAR is issued twice, with an update incorporating the year end figure.

Accuracy of reported data

9.1.29 Our audit has concentrated on ensuring that processes for data collection, analysis and reporting are robust.

Safety Management Incident System.

9.1.30 The base data for the majority of the KPIs is drawn largely from the Safety Management Information System (SMIS). Data collection for this begins within the Network Rail Control Centres where all incidents are logged and recorded on a real time basis. Each day, a copy of the previous day's incident log is passed to performance safety specialists who input the raw data into SMIS. Staff undertaking data input receive training in understanding how to enter and correctly categorise data within SMIS and are managed through a number of Route Safety Performance Specialists (RSPSs). Detailed industry guidance is given on what information is required to be transferred from the incident log into SMIS for reporting purposes.

- 9.1.31 Not all data input to SMIS lies within Network Rail's control – some is done by TOCs, although this tends to be more for issues specific to train operation rather than infrastructure, or commentary on aspects of wider incidents, rather than core reporting on them. In addition, some contractors, such as Balfour Beatty have SMIS inputters; however, more and more this is controlled through Network Rail. It was reported to us that not all TOC incidents are reported to Network Rail Control, making it difficult for Network Rail to pick up everything that happens on the network. This is mitigated through regular meetings with TOCs, and liaison over incident numbers. Based on our knowledge of the data used to produce Network Rail's KPIs we do not believe that TOC data entry is likely to have had a material effect on the data reported in the Annual Return, although it may affect the near miss category for Level Crossing data.
- 9.1.32 The integrity of SMIS data depends on the quality of information provided by Control. In the past, there has been no briefing for controllers on the SMIS event matrix, nor do they necessarily know what data is required by the safety team in order to complete the SMIS entry. Moreover, reportable events to HMRI are not always recognised at Control level. This can make the quality of initial source data for SMIS entries variable. In general, this would be picked up by the Area Safety Teams who will expand the data entry as far as they are able in conjunction with the relevant Control Team member.
- 9.1.33 Network Rail is working to improve the current quality of safety data. Work instruction NR/LZ/INV/002 (a level 2 document) was introduced in December 2007 and contains instructions on data reporting. It gives guidance on local investigations, SMIS monitoring and so on, and introduces an annual requirement for SMIS monitoring, concentrating on the KPI reporting categories. Monitoring is required to be periodic and if Routes do not comply then they must submit a "temporary non compliance" against the standard to Headquarters. One of the Areas interviewed was found to have introduced this system from the beginning of last December, establishing a local process for sampling the quality of SMIS records. This checks that data has been accurately described, categorised and entered by inputters into SMIS in accordance with the SMIS matrix by comparing source (Control Log) data with corresponding SMIS records. To date, results have been mixed, with some examples of inaccurate allocation.

Safety information database.

- 9.1.34 For reporting through SEAR, the Safety Information Database (SID) is used. This is built around the KPIs and is accessed directly once per period by a member of the Health and Safety Systems team. RSPSs undertake checks between SMIS and SID. Data from SMIS is also used by the Tactical Safety Group providing a double check on anomalies between SMIS and SID. Additionally, Route Managers also have a vested interest in ensuring SMIS is correct as certain items such as significant incidents are reported direct from that database. Standards for SMIS data are set by RSSB. In addition, RSSB do annual reports based on SMIS data; one of the checks made by Network Rail is actual performance as recorded by SMIS against outputs from RSSB's pre-cursor model. If and where significant variation is found, an investigation is undertaken.

RIDDOR reportable accidents.

- 9.1.35 Details for this measure are taken from SID. As Figure 9.1.1 above illustrates, data goes through a substantial chain before it reaches the team producing the reports.
- 9.1.36 The formal reporting process begins via Network Rail Control Centres. However, reportable accidents involving contractor or Network Rail staff may be initially reported into Area Infrastructure Fault Controls (IFCs), or via an Accident Hotline, depending on the Area. An accident form should be completed for every incident, whether reportable or not. There have been occasional examples in at least one Area of forms received for incidents for which no entry appeared in the Control Log. Both Accident Forms and Control Log entries are used as source data for SMIS entries.
- 9.1.37 In addition to SMIS records, both the RSPSs we interviewed at Route level have independently of each other established a separate database for accident forms. The reasons given for this include:

- (a) difficulties of undertaking required levels of data analysis within SMIS (a function partly of limited data categories but also of staff competence and training on using the reporting functions within SMIS);
 - (b) providing a back-up system at times if and when problems occur in SMIS (as they did two years' ago during the upgrading of the system) and;
 - (c) the immediacy of the Excel tool allows instantaneous updates of the numbers of incidents.
- 9.1.38 Centralised reporting for RIDDOR is undertaken through the maintenance Headquarters team in London. Periodic reports from Areas are collated and double checks undertaken against SMIS and other source data.
- 9.1.39 Hours worked cannot be downloaded automatically from HR systems. This is leading to some discrepancies in the way in which this part of the measure is calculated. In one Area, hours worked by the maintenance team were being supplied by the Area Workforce Safety Administrator. However, for Operations Staff, the same Area was relying on a standard hours figure, with a manual overlay for possessions and other factors. This suggests the potential for discrepancies in reporting hours worked across Routes leading to either an under or over statement of the hours.

Level Crossing Misuse.

- 9.1.40 Accuracy of data is known to have been a problem in the past. In particular, some crossings are known by alternative names, which has sometimes made accurate linking of incidents to locations difficult. One of the Areas told us that the Level Crossing Database was now used as a reference to ensure that incidents within SMIS are correctly allocated to locations. The other Area referenced enhancements to SMIS (relevant to their Area only) that means that specific Level Crossing sites can now be accurately pinpointed and identified. Prior to this enhancement, sites tended to be identified by station location – some inputters would put in country side, some the London side. Now all locations have a unique code, substantially increasing the accuracy of the data.
- 9.1.41 In terms of the source data, two other things should be noted. Firstly, the reporting of near misses relies on someone reporting the incident, whether that is the driver of a train, another member of railway staff or a member of the public. To an extent that is impossible to quantify, this reporting will depend on an individual's perception of the severity of an event and on their preparedness to report it. Secondly, final categorisation within SMIS relies on the RSPSs further re-interpreting the source data provided to them.
- 9.1.42 The definition and the results for Level Crossing Misuse are inconsistent in the Annual Return. The definition states 'Any occurrence of a train striking a road vehicle on a level crossing is equal to 1 equivalent collision; other events are weighted at 0.1 equivalent collisions, while the results are not calculated based on this definition. The results are based all safety related incident on level crossings, i.e. all equivalent to 1 (no weighting). Following discussions with Network Rail it is understood that the definition is out of date and was not update in error. We recommend that the definition in the annual return is corrected.

Category A SPADs.

- 9.1.43 Category A SPADs are reported compulsorily and have a very high profile. Initial notification of a Category A SPAD to RSPS teams comes from Network Rail Control centres. The Controls complete an initial Category A SPAD reporting form which is passed to the local RSPS. All incidents are entered into SMIS. At least one of the Areas we interviewed maintained a separate spreadsheet for SPAD incidents in addition to data held on SMIS. Both teams interviewed hold an electronic and paper audit trail for SPAD data, including details of investigations held; at least one Area was subject to annual audit on this.
- 9.1.44 The risk ranking applied to the SPADs is taken from the investigation findings.

- 9.1.45 Discrepancies can occur between core SPAD database and other systems – for example, if a SPAD leads to a derailment, the SPAD element might go unrecorded in SMIS. RSSB keep a second database and would challenge the Network Rail Headquarters team if discrepancies arose – in practice, the numbers usually match. Occasionally, the Headquarters team find that classification changes can occur – for example from an operating irregularity to a Class A SPAD. In this case the system has to be changed retrospectively.
- 9.1.46 The number of signals used in the measure is provided by the Route.

Infrastructure wrong side failures/operating irregularities.

- 9.1.47 Data for this measure is taken from the National Asset Database. This is an automatic system, which automatically refreshes data in SEAR, removing the need for manual interventions. The train mileage figure used in the calculation of the KPI is supplied by the Performance team.

Criminal Damage.

- 9.1.48 Source data for entry into SMIS comes through the Network Rail Control Centres. In the past, this has been one of the areas where Network Rail's internal statistics have not matched those held by TOCs (it is not uncommon for reporting of damage to be from drivers to their own TOC control). This is being resolved through better liaison between TOCs and Network Rail (for example, co-location of Control Centres and the sharing of incident reports) as was not felt by the RSPSs to be a major problem.
- 9.1.49 There is also a company standard on railway crime reporting with Area safety teams mandated to have a spreadsheet recording certain types of crime. At least one Area told us that this could take base data from SMIS, but doesn't as the SMIS database is not judged to give the level of comment and detail required.

Training and competence

- 9.1.50 SMIS training is given to new starters, including in the use of the SMIS matrix (issued by RSSB). The matrix goes through incident types and shows how different components should be input into SMIS.
- 9.1.51 Within Network Rail meetings are held every 3 months, chaired by the Head of Safety Systems and bringing together the RSPSs. This gives an opportunity to share best practice, inform Area teams of safety data processes and so on.

Organisation

- 9.1.52 The current organisation includes Route Safety Performance Specialists, with the responsibility amongst other things of managing and supporting staff with SMIS inputting responsibilities. This organisation appears to have merit in providing a focus for safety reporting at an appropriate level within Network Rail. However, it is relatively new (at least one RSPS interviewed had been in post only since the summer of 2007) and hence was not in place for the entire reporting period in this annual return.

Accuracy of reported commentary

- 9.1.53 We found nothing during audit that contradicts Network Rail's reported commentary.

Assessment of confidence grade

- 9.1.54 **Reliability grade.** We believe that Safety should have a reliability grade of B.
- 9.1.55 **Accuracy grade.** We believe that Safety should have an accuracy grade of 2.

Audit Statement

- 9.1.56 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2008 for Safety. The data has been assessed as having a confidence grade of B2. This score is in no way a reflection of the professionalism and dedication of the Network Rail staff that we have encountered in the course of auditing this measure. Rather, it reflects the level of manual intervention that has to be made in reporting on the safety measures, and in particular, the development of a number of parallel reporting systems as a result of genuine or perceived inadequacies of SMIS. There is no regulatory target for this measure.

Recommendations arising

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

- 9.1.57 **Safety recommendation 1.** We have some minor concerns in relation to the data accuracy of these KPIs (for example, the hours worked figure used in RIDDOR). We recommend that Network Rail give due attention to continuing to support its Safety Team in improving data accuracy.
- 9.1.58 **Safety recommendation 2.** We have some concerns over the consistency of the definitions and results (for example, the level crossing misuse) and the communications of changing definitions of KPIs. We recommend that these are corrected and the correct processes are established to ensure that future changes in definitions are correctly communication through Network Rail.

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

- 9.1.59 **Safety observation 1.** In auditing this measure the contrast between Safety and Performance reporting has been marked. It is evident that the Performance Reporting and Improvement system has benefited immensely from the high focus of attention within the industry as a whole on train service performance. Whilst already competent, there may be benefits from taking some of the best practice that has been learned in the area of Performance Reporting and extending this into SMIS. This could, for example, include a greater focus on data quality, consistency of reporting, exchange of best practice and so on.
- 9.1.60 **Safety observation 2.** We note that the Safety Team is working to refine the targets for their Safety KPIs. for example, the development of a risk ranking tool to understand better the potential impact of operating irregularities. We support Network Rail in this.

Progress on outstanding recommendations from previous audit reports

- 9.1.61 There are no outstanding recommendations for 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 2008, Section 5, Safety and Environment Enhancements, including Table 5.7.
- 9.2.2 The measure reports Safety and environment (S&E) enhancements. These are funded from the Safety Enhancements Fund which is currently comprised of the pollution prevention programme at light maintenance depots (LMDs); various environment schemes; and the provision for small safety related projects to achieve particular safety criteria to strategically align the business objectives.
- 9.2.3 The definition for this measure and the reporting requirement is based on Network Rail's Licence, which requires Network Rail to have an environmental policy. However, the environment enhancements are funded from the Safety Enhancements Fund; the programme associated with this has its own targets in terms of spend and target dates for implementation. The latter in turn are in part driven by the need to comply with legislation.
- 9.2.4 Audits were undertaken at Network Rail Headquarters. The audit process for this year has concentrated on environment enhancements.

Commentary on reported data

Regulatory target

- 9.2.5 The principal Regulatory requirement for Network Rail is to have an environmental policy.

Audit findings

Process

- 9.2.6 The current policy was written in 2003 and will be re-written for 2008/09 to incorporate the principles of a sustainable railway.
- 9.2.7 Following an internal re-organisation, there has been a hiatus in terms of environmental policy leadership within Network Rail. However, implementation of existing policy has continued through local management teams, with responsibility for the stewardship of protected heritage (for example vegetation management) sitting with infrastructure teams. A new Head of Environmental Policy was appointed in mid 2007.
- 9.2.8 Policy implementation comes through specialists in the investment, enhancement and renewals teams, sitting underneath the Infrastructure Investment organisation. There is an environmental management system (currently under revision) for implementation. In addition, the implementation of the environmental policy is enshrined within Network Rail's GRIP process. This provides the framework within which projects are delivered and environmental considerations managed. A number of delivery manuals support GRIP, amongst which DEL04 is the environmental manual, for which the Environmental Specialist, Infrastructure Investment is the owner. DEL04 can be described as that part of the corporate environmental system relevant to project delivery. Compliance with DEL04 is audited under Network Rail's management system audit which audits compliance with GRIP. In addition, the Infrastructure Investment function's self assurance process for project and line managers includes a suite of environmental questions.
- 9.2.9 A standard project procedure has been developed and documented. It details those environment performance indicators (EPIs) that are important in project management. This includes a documented suite of EPIs and ensures common understanding and consistency across all project teams. In drawing up the EPIs environment objectives have been aligned with existing processes and procedures, using terms already familiar to non-specialists, as a way of increasing the ownership of environment issues, integrating the latter into the organisation rather than bolting them on.

- 9.2.10 EPIs are split into reactive and proactive indicators. Proactive EPIs cover waste management and Reactive EPIs cover:
- (a) Unplanned releases;
 - (b) Damage to SSSIs;
 - (c) Harm to protected species;
 - (d) Any other.
- 9.2.11 Reports on the EPIs have begun to be collated each 4-week period. A severity index has been developed for incidents, mirroring the one used for safety incidents. Work undertaken in 2007/08 includes ensuring environment aspects included in the Standard Project Procedure (SPP) for accident/incident investigation. Procedures now cover for example harm to the environment, damage to property and so on and set the levels of investigation that should take place. The SPP is being updated to take account of corporate EPIs for CO₂ and water usage that are being developed by the Head of Environmental Policy.
- 9.2.12 Network Rail now has a charter with suppliers that states Network Rail's expectations in terms of environmental policy from suppliers. All suppliers are required to have their own environmental policy.
- 9.2.13 Network Rail's own employees are briefed via "toolbox talks", DVDs, videos and so on. These are being updated and will be re-launched for 2008/09.
- 9.2.14 Stakeholders have been brought in through consultation. This has led to definition of 7 workstreams, one of which is "energy efficiency and sustainability" – Network Rail is working with the rail industry including RSSB to help to develop a programme for the sustainable railway.

Accuracy of reported data and commentary

Environmental policy

- 9.2.15 We can confirm that an environmental policy exists and is disseminated throughout the organisation.

National pollution prevention programme

- 9.2.16 Phase one of the work was compliance with the Oil Storage Regulations which had to be in place by 1 September 2005 in England. Phase 2 has encompassed Groundwater Regulations in England and compliance with the Oil Storage Regulations in Scotland and Wales. Work was substantially complete by December 2007, although some elements are still ongoing. The programme has encompassed 91 traction depots and 330 sites where oil is stored in smaller quantities (1500 litres or more). The latter tend to be isolated buildings, with no power supply, reliant on local generators. Implementation of the programme has made all these sites compliant with both sets of regulations, although half a dozen sites are causing difficulties still.
- 9.2.17 The original target for completion was October 2008 – this was brought forward to December 2007; a 95% compliance rate has been achieved against this revised target in terms of physical works. Most sites are now awaiting the completion of GRIP Stage 8. Completion is dependent on TOC stakeholders and Network Rail has experienced some issues in achieving handback. In some cases, implementation requires TOCs to carry out consultation with staff (for example, on the use of new/different equipment and working practices). Every depot scheme has required consultation with the end user, who has had input into the end design. Delays in the TOC side of the process have led to issues for Network Rail; for example, where TOCs damage equipment at a depot not yet handed back, Network Rail have to make good the damage in order to remain compliant with regulations, with no easy contractual comeback against the TOC. The scheme was also affected by difficulties in the supply chain; in particular, M&E design has proved a problem area with a shortage of engineers who can undertake system design leading to quality and delivery issues.

Contaminated Land

- 9.2.18 The programme began around 1995. Initially, desk studies reports identified around 600 sites, of which 440 were subject to intrusive investigation comprising, desk study and physical investigations. This found contamination at around 100 sites. By 2002 100 Tier 3 investigations were completed using approved source pathway receptor models in order to determine whether contamination was in fact a problem – even if there is a source, it does not necessarily lead to pollution risks on or off site.
- 9.2.19 In 2002/03 the programme was reorganized and rationalised: this led to the identification of:
- (a) 15 free oil contaminated sites;
 - (b) 30 for long term monitoring of groundwater;
 - (c) 15 with some oil, but not too significant;
 - (d) <40 contaminated with PCBs with a risk of utility drainage, streams and rivers.
- 9.2.20 The work enabled Network Rail to assess and control risks. The methodology was discussed with the Environment Agency who agreed that in the majority of cases there was no need to install treatment plants – thus by challenging initial assumptions as to the levels of risk and hence remedial work required, savings of around £1.45m were made at each of 36 sites.
- 9.2.21 The programme appears to have been successful with no Network Rail sites appearing on local Contaminated Land Registers (the issue is regulated by the Local Authorities Environment Agency, SEPA in Scotland). One reason for this has been Network Rail's proactive policy and strategy in taking issues to the regulators early, together with their ideas for solutions. The programme is now virtually complete, with just 5 sites in long term remediation. These sites have been handed over to the relevant asset stewards for on-going management.

Training and competence

- 9.2.22 The development of environmental awareness within Network Rail has been championed by a number of qualified and competent individuals. They appear to have been able to capitalise on a growing awareness of environmental issues in society at large to raise the profile of issues internally to the company.
- 9.2.23 Good practice is promoted and shared. Examples of this include direct meetings with the TOC Sustainability Group and the facilitation of workshops with RSSB, TOCS etc. The Environment Specialist Infrastructure Investment is also working to highlight good and best practices/understanding especially amongst contractors.
- 9.2.24 A training programme, "Project Environment Management" has been launched. This is designed for staff with responsibilities under DEL04 and raises their awareness of what needs to be produced to comply with GRIP requirements in relation to the environment. Attendance of the training programme gives project staff a validation which must be renewed after 5 years.
- 9.2.25 An Environment Working Group (EWG) was set up in 2006, with representatives from each "leg" of the Infrastructure Investment function. Representatives are Environmental Managers or HSQE Managers (or delegates). The forum meets 8 weekly and is minuted. Agendas typically cover briefing, sharing of information, action tracking for issues raised at previous meetings. The forum provides an opportunity for sharing knowledge, expertise and specialisms (including talks from guest speakers) – Network Rail inform us that this is leading to a better application of knowledge across the organisation as individuals now know where to find colleagues with specialist knowledge on a particular aspect of the environment.
- 9.2.26 A contractors' forum – Rail Infrastructure Environment Forum was established in December 2006. Again, the forum provides an opportunity to share best practice, and is "run by the industry for the industry" – the chair rotates annually between contractors.

- 9.2.27 The Environmental Specialist Infrastructure and Investment is also using existing and planned safety communications programmes and channels to get across the environment message to ensure people take ownership of the issues. These include using toolbox talks and using mobile class rooms for teach-ins on environmental topics – this helps front-line staff understand the sensitivities around the issues.
- 9.2.28 A behavioural change programme – Making a difference – was launched about a year ago, targeted at front line staff and driven by safety considerations. The programme is modular based and includes a number of modules on environment issues. The programme recognises that many of the principles between managing safety and managing environment aspects are the same, for example, why accidents happen, how the brain works, and how time pressures can lead to risk taking. The programme aims to help facilitate the further development of the safety/environment aware culture and uses coaches drawn from across the workforce – typically supervisors, gangers, operators – known to the front-line. Coaches receive coaching training and training in the principles of safety/environment and then deliver modules to their colleagues.

Organisation

- 9.2.29 Much of the core responsibility for policy implementation lies with the Infrastructure Investment team. There are currently seven “legs” under the Infrastructure Investment Organisation – Enhancements, SPC, Construction, WRCM, Thameslink, CrossRail and Track renewals/S&Cs. Organisational design allows for each of the programmes within Infrastructure Investment to have their own dedicated environmental specialists. Within the function as a whole, the Environmental Specialist acts as the professional head for environment issues. The decision as to whether a programme has its own specialist is based on the risk and opportunities associated with a specific programme of work. The profile of environmental issues – and associated resources – has increased, to a level that could be considered more appropriate to the environmental risks to be managed by the Infrastructure Investment function. It is recognised that if a major programme is to be delivered to time, cost and specification the environmental risk has to be managed. WCML had a team of around 5, and Thameslink 7. CrossRail currently has 2. Enhancements, which is also dealing with new build and planning permissions, also has dedicated specialist resources.

Assessment of confidence grade

- 9.2.30 **Reliability grade.** We believe that Environment should have a reliability grade of A.
- 9.2.31 **Accuracy grade.** We believe that Environment should have an accuracy grade of X as no tangible, reportable data presently exists.

Audit Statement

- 9.2.32 We have audited the reliability and accuracy of data and commentary presented in Network Rail’s Annual Return 2008 for Environment. The data has been assessed as having a confidence grade of AX. The regulatory target for this measure has been met in so far as an environmental policy is in place. Moreover, the physical works required to deliver the NPPP programme are in place such that Network Rail has taken the steps to comply with national legislation.

Recommendations arising

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

- 9.2.33 **Environment recommendation 1.** New KPIs are being developed for 2008/09 which will include the 17 key suppliers in Network Rail’s supply chain. KPIs will cover for example, how much fuel is used in delivering supplies/services to Network Rail. Performance KPIs will be reported to the Network Rail Board through an environmental index. Given the developing awareness and sophistication of the management of environmental measures within Network Rail, it may be appropriate to give thought to defining appropriate KPIs for future Annual Returns. These should be based on factors already measured by Network Rail.

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

- 9.2.34 **Environment observation 1.** We were particularly interested to note during audit that a conscious effort had been taken by one manager to use processes already familiar to front-line managers and staff from safety management practices to raise the profile and improve the management of environmental issues. This using of a tried and tested approach for a new application seems to be delivering significant benefits in terms of local understanding and ownership. In this case it has come about because the responsible manager had experience in both safety and environment processes. However, there may be benefits to be gained elsewhere in Network Rail from sharing best practice of this kind cross discipline.

Progress on outstanding recommendations from previous audit reports

- 9.2.35 There are no outstanding recommendations for this measure.

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 2006/07 and 2007/08.
- 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 2008, Section 6, Maintenance, including Table 6.34 and 6.35.
- 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.
- 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 2007/08 maintenance efficiency savings is 8% per annum for the first four years of the Control Period (28% cumulative).
- 10.1.9 The results for 2007/08 show:
- (a) Variance against maintenance allowance is 28.5% which is better than target; and
 - (b) 2004/05-2007/08 variance for maintenance expenditure normalised by ETMs is 31% which is better than target.

Trend

- 10.1.10 Figure 10.1.1 shows the variance between regulatory target and ACR allowance is narrowing over the control period.

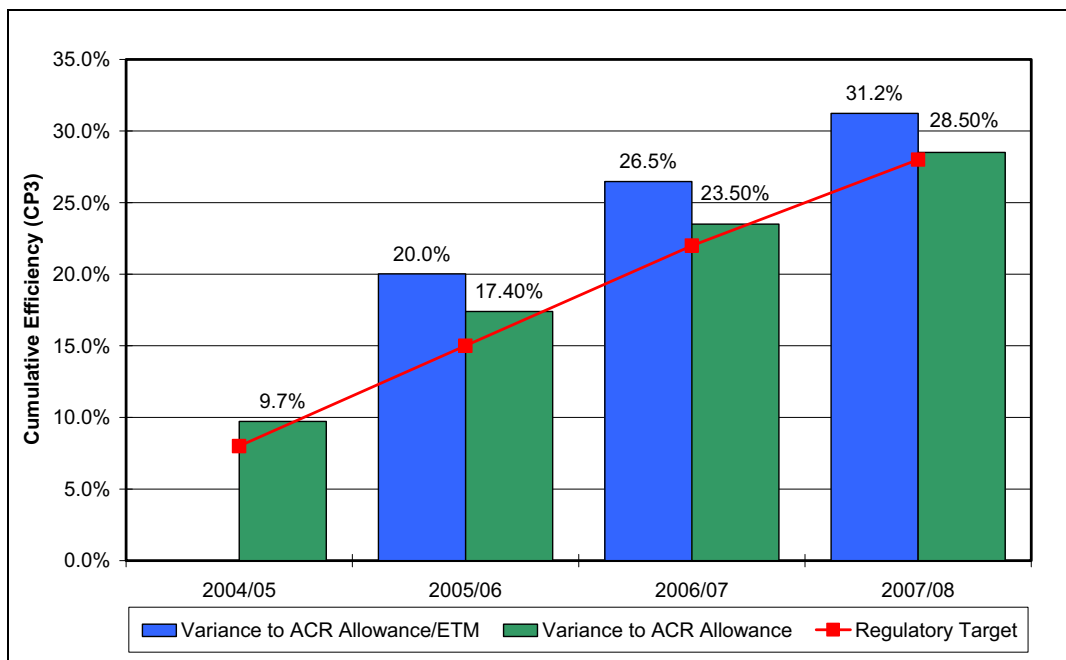


Figure 10.1.1 Maintenance expenditure efficiency savings

Audit findings

10.1.11 The efficiency values are calculated using data from the Regulatory Accounts. The use of ETMs is a sensible method for normalisation of the maintenance costs.

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 2008 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 audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2008, Section 6, Maintenance Unit Costs, including Table 6.35 and 6.36.
- 10.1.20 This measure reports unit cost rates for maintenance activities. Network Rail currently collects data for twenty-three maintenance unit cost rates and is trialling others. In the 2007/08 reporting year, twelve maintenance unit costs have data which Network Rail considers "are reasonably accurate at a network-wide level" but "are not yet robust enough for rigorous benchmarking". The twelve measures included are:
- (a) Rail Changing: number of rail yards of plain line CWR or jointed rail replaced due to wear, corrosion, damage or defects;
 - (b) Manual Spot Re-sleeping: 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: number of track miles inspected;
 - (f) Manual Correction of Plain Line Track Geometry: number of track yards of manual correction of plain line track geometry;
 - (g) Point End Routine Maintenance: number of point ends undergoing routine maintenance;
 - (h) Signal End Routine Maintenance: number of signals undergoing routine maintenance;
 - (i) Track Circuits Routine Maintenance: number of track circuits undergoing routine maintenance;
 - (j) S&C Arc Weld Repairs: number of arc weld repairs to switches;
 - (k) Arc Weld Repair of Defective Rail: number of arc weld repairs to rail defects;
 - (l) Thermit Welding: number of rail joins using alumino-thermic welding.
- 10.1.21 The definition and procedures for this measure 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 Audits were undertaken at Headquarters, including Network Rail's Champion for this measure, Head of Maintenance National Specialist Team (NST) and Head of Maintenance Assurance.

Commentary on reported data

Regulatory target

- 10.1.23 The regulatory target for 2007/08 maintenance efficiency savings is 8% per annum for the first four years of the Control Period (28% cumulative). However, as noted above, Network Rail does not expect these measures to be robust enough for benchmarking.

Findings

Changes to process

- 10.1.24 Network Rail has previously identified shortcomings in the levels of data quality being achieved, which we have highlighted in previous reports. Actions we are tracking to overcome these shortcomings include:
- (a) Reissue Network Rail Company Specification FRM702 Reporting of Maintenance Unit Costs (issued);
 - (b) Issue of an Ellipse Manual (issued);
 - (c) Form a quarterly Unit Cost Working Group (complete) and ad hoc Territory and Area working teams;
 - (d) Roll-out Oracle Projects for maintenance and a national labour appropriation system (expected to be operational for start of 2008/09 year);
 - (e) Develop new measures to incorporate over 50% of maintenance spend in maintenance unit cost regime (developed and trialling);
 - (f) Move from reporting maintenance unit costs on a year-to-date basis to a rolling thirteen period basis (complete);
 - (g) Phase 2a Maintenance Reorganisation is planned to deliver enhanced data quality by properly allocating accountability and providing further resources for each section discipline in the maintenance delivery teams;
 - (h) Ellipse, Network Rail's work scheduling tool, in conjunction with the Phase 2a organisational restructure is planned to align to a revised standardised financial cost centre structure; this will enable much more efficient data capture, comparability and analysis;
 - (i) Phase 2a Maintenance Reorganisation is planned to deliver an enhanced assurance and compliance regime for maintenance delivery, incorporating risk management, audit, verification, self certification, compliance indicators, non-compliance management, work bank management, competency framework, contractor/supplier management and meeting structures.
- 10.1.25 We found evidence of considerable change management activity to improve the quality of maintenance delivery and the maintenance unit cost measures.

Process

- 10.1.26 The process for calculating maintenance unit costs remains as for previous years:
- (a) The units (volume) of each type of maintenance activity is recorded using Ellipse (Network Rail's maintenance work management system for planning and recording hours and volumes for work activities);
 - (b) Total Direct Staff costs and Direct Agency Labour costs are captured at a Maintenance Delivery Unit level in Oracle (Network Rail's finance management system) and apportioned using the ratio of hours booked against each type of maintenance activity in Ellipse; the hours booked in Ellipse are productive 'time on tools' hours only, not incorporating travel time etc;
 - (c) Other costs are captured in Oracle and allocated directly to each type of maintenance activity.
 - (d) At Headquarters, the data from Ellipse and Oracle are combined to create the maintenance unit costs on a year-to-date basis; this task is performed using a bespoke spreadsheet macro. The process of reporting has been amended from previous years to allow a results summary to be run directly after period end, upon which the Delivery Units have a 1.5 week period of time to check and correct any errors identified, before a finalised version is issued.

Data accuracy

10.1.27 **Work Orders.** Maintenance NST Period 13 reports show that an average of 369 work orders per week (c. 0.49%) had work volumes which were zero or work hours which were zero or 1 minute. This is comparable with 2006/07 performance which was an average of 587 per week.

10.1.28 **Asset Data.** Maintenance NST Period 12 reports show there were 225,061 errors in Ellipse for seven key asset data fields (Figure 10.1.2). There were approx. 1,541,196 assets in Ellipse at the time. These errors have a number of impacts on the efficient use of work orders including the correct identification of assets on site; however, this is unlikely to be a material source of inaccuracy to maintenance unit cost measures.

Source	2007/08		2006/07	Variance (2007/08 vs 2006/07)
	Number of Errors	% of Total Asset Records	Number of Errors	
Item Name 2 at variance with Description	11,314	0.7%	13,030	-13%
Rail ID entered incorrectly	58,646	3.8%	76,663	-24%
Item Name 1 entered incorrectly	61,705	4.0%	76,105	-19%
Position Code is blank on the Classification Tab	35,805	2.3%	202,188	-82%
Delivery Unit Code is blank on the Classification Tab	14,650	1.0%	44,124	-67%
Start/ End Mileage inconsistencies	57,081	3.7%	65,899	-13%
Signalling Assets without Signal Sighting Cab Ride checked	2	0.0%	7	-71%

Figure 10.1.2 Maintenance NST Ellipse data quality (Periods 1 to 12, 2007/08)

10.1.29 **Unit Cost Rates.** Figure 10.1.3 compares Territory and National average maintenance unit costs. Unshaded cells are for maintenance unit costs reported in the Annual Return; shaded cells are for maintenance unit costs not reported in the Annual Return.

10.1.30 There is wide variation between the Territory maintenance unit costs and the national maintenance unit costs:

- (a) 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. However, when this analysis is conducted on an Area or Delivery Unit basis, it is clear that the data is not yet of sufficient quality as significant outliers are present.
- (b) A common error appears to be volumes and/or costs being reported against the Area headquarters not against the delivery unit which has delivered the work.

10.1.31 **Output definitions.** Further to our previous audits on maintenance unit costs, we remain of the opinion that whilst the definition of the MUCs is reasonably clear, in terms of reportable costs and reportable maintenance outputs ('Ellipse Level 3 Items'), the definitions and measurement methods for the output volumes are open to local interpretation. Now that the mechanics of collecting and reporting data from the maintenance teams are in place, Network Rail should consider:

- (a) Further describing the reportable maintenance outputs and the definitions of the output volumes; this should be documented in Company Specification FRM702 *Reporting of Maintenance Unit Costs*; more precise specification of the outputs and their volumes would enable Network Rail to better communicate its requirements to its maintenance teams, so improving the quality of the maintenance unit cost data;
- (b) Describing the method by which a reportable maintenance output is measured for a reportable maintenance output (i.e. for each maintenance unit cost) and training maintenance teams in these methods; this would improve the quality of data capture.

Maintenance Unit Costs	Variance between Territory & National MUC				
	LNE	LNW	SCT	SEA	WES
Manual ultrasonic inspection of rail	-66%	+30%	+3%	+71%	-63%
Rail changing	+17%	+6%	-12%	+3%	-23%
Manual spot re-sleepering	-10%	+4%	-7%	+25%	-6%
Plain line tamping	-44%	+110%	-18%	-17%	+11%
Stoneblowing	-12%	-2%	+22%	+20%	-15%
Manual wet bed removal	+42%	-1%	-55%	+23%	-32%
S&C tamping	-28%	+79%	+27%	-19%	-41%
S&C replace crossings & 1/2 units	+6%	1%	+40%	-8%	-10%
Replacement of s&c bearers	-11%	-17%	+45%	-4%	+24%
S&C arc weld repairs	-3%	+74%	-6%	-14%	-18%
Mechanical wet bed removal	-27%	+182%	+110%	+37%	-41%
Level 1 patrolling track inspections	29%	-2%	-20%	+3%	-23%
Level 1 mechanised visual track inspection (patrolling)	+277%	+177%	-9%	+433%	-7%
Arc weld repair of defective rail	-28%	-3%	-15%	+91%	-39%
Installation of pre-fabricated insulated joint renewal	-26%	+78%	-64%	+47%	-16%
Mechanical reprofiling of ballast	-27%	+117%	+90%	+46%	-84%
Thermit welding	-14%	+29%	+60%	-13%	-16%
Manual correction of plain line track geometry	+18%	+30%	-27%	-13%	-16%
Manual reprofiling of ballast	-12%	+37%	+43%	-26%	+2%
Point End Routine Maintenance	+8%	+7%	-30%	+11%	-15%
Signals End Routine Maintenance	0%	+14%	-17%	+23%	-37%
Track Circuits Routine Maintenance	-8%	+7%	-19%	+13%	-10%

Figure 10.1.3 2007/08 Territory Maintenance Unit Costs as a percentage of National Maintenance Unit Costs

- 10.1.32 **Input definitions.** Though not essential for the proper functioning of an output-based maintenance unit cost regime, the work method and resourcing assumptions (inputs) are not currently specified. This is relevant as there are a number of different work methods which can be used to deliver a reportable maintenance output, with local variations apparent in both method and resourcing – as the work inputs are not undertaken or recorded in a standardised manner, Network Rail is not always able to explain the variations in output volumes and costs experienced, even though these variations may be correct. Network Rail should consider further describing the inputs necessary to deliver each of the reportable maintenance outputs by specifying the work method and number/type of resources expected to be deployed to undertake it. More precise specification would also enable Network Rail to monitor maintenance team productivity and the impact of work-mix (the different proportions of work methods chosen to deliver the maintenance output) on each maintenance unit cost.
- 10.1.33 **Error Trapping.** Further to our previous audits on maintenance unit costs, we remain of the opinion that a systematic approach is required to eliminate data entry errors, such as automated error-checking in Ellipse to eliminate entry of zero value or very low 'dummy' values (e.g. 1 minute in an 'hours worked' data field).

Assessment of confidence grade

- 10.1.34 **Reliability grade.** 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. However, the data quality processes are disjointed and there are known problems with the initial capture of work volumes. We believe the maintenance unit cost data should have a reliability band of C.
- 10.1.35 **Accuracy grade.** The variation in the dataset appears quite large. Statistical analysis of the dataset is required to attribute this variation to collection error or to genuine differences in the underlying unit rates; however, given the known issues with the underlying data collection process, it is likely the larger portion of this variation is from process error not underlying differences in unit costs. We believe the maintenance unit cost data should have an accuracy band of 5.

Audit Statement

- 10.1.36 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2008 for maintenance unit cost indices. We believe the maintenance unit cost data should have an accuracy band of C5.

Recommendations arising

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

- 10.1.37 **MUC recommendation 1.** 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.
- 10.1.38 **MUC recommendation 2.** 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.
- 10.1.39 **MUC recommendation 3.** 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.

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

- 10.1.40 **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.
- 10.1.41 **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

- 10.1.42 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>2007-R43: 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 is planned to deliver some or all of the intent of this recommendation. We expect to be able to review this in 2008/09.</p> <p>Current Status – Repeated in later year</p>
<p>2007-R44: 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>Current Status – Repeated in later year</p>
<p>2007-R45: 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. We expect to be able to review this in 2008/09.</p> <p>Current Status – Repeated in later year</p>

Figure 10.1.4 Progress on outstanding recommendations for Maintenance

10.2 Renewals Efficiency

10.2A Introduction

- 10.2.1 There is currently no single way of assessing Network Rail's performance in delivering renewals efficiency against the regulatory target as:
- (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 Network Rail's renewals efficiency is therefore assessed using a combination of unit cost indices (mostly with benchmarks more recent than 2003/04) and budget variance analysis:
- (a) Budget variance analysis represents the difference between budgets (including contingencies) and actual expenditure within each year; for each project this difference is categorised according to the type of efficiency (or inefficiency) which has delivered the variance;
 - (b) Unit costs represent a partial but '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, for example, in order to compare the unit rate of bridge construction, the cost of transporting materials to site is excluded to ensure the costs are comparable;
 - (ii) Unit costs do not take into account *inter alia* volume efficiencies (by eliminating/ reducing the amount of work that needs to be undertaken in a given year while maintaining network outputs without compromising network sustainability) or other activity efficiencies (such as employing different methods/ solutions to deliver similar network outputs for different costs without compromising network sustainability).
- 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, Signalling & Telecoms;
 - (c) Renewals Budget Variance;
 - (d) Comparison of results with regulatory targets.
- 10.2.4 In this section, 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 2008, Section 6, Renewals Efficiency, including Tables 6.38-6.40.
- 10.2.6 This measure reports:
- Unit costs and unit cost indices for plain line track, switch & crossings track and total track, which are derived by aggregating separate unit costs and unit cost indices for twenty different work activities; each index is the change in unit cost weighted by the volume of each activity in 2006/07; the indices are based on 2003/04 costs = 100;
 - 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 2006/07 workbank; the rates are compared with 2003/04 cost benchmarks in 2003/04 prices;
 - 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 Headquarters, comprising the Estimating team and Track Renewal Programme team and Head of Investment Efficiency.

Commentary on reported data

Form & content

- 10.2.8 Network Rail has not reported track unit costs in the Annual Return this year, as requested by ORR in the Form and Content, arguing that the composite rates are a better measure. The composite rates include central costs and non-volume costs whereas the track unit rates do not; hence the composite rates represent a larger percentage of the renewals budget. Network Rail was concerned that presenting unit and composite rates was confusing; this does not appear to have been agreed in advance with ORR. We have provided the track unit rates in the table below, with the agreement of the relevant Network Rail champion.

Regulatory target

- 10.2.9 The regulatory target for 2007/08 efficiency savings is 26% (cumulative over the first four years of the Control Period). 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 10.2E below.

Change of price base

- 10.2.10 As discussed in section 10.2.19 below, we have found that the RPI rates used by Network Rail in the spreadsheets for unit costs are not consistent; we have therefore used the RPI data independently sent by Network Rail's Finance department to rebase prices from 2003/04 to 2007/08 for the 2007/08 data in this section; we have not changed previous year's reported data. The numbers below will therefore differ from those presented in the Annual Return.

Trend – unit cost indices

- 10.2.11 84.5% of track renewals expenditure has been reported as unit costs. Figure 10.2.1 and Figure 10.2.2 show that over the portfolio unit rate efficiencies for track renewals have reversed since last year:
- Plain line track renewal efficiency is down from 17.2% last year to 10.8% this year;
 - Significantly improved S&C efficiencies are reported, down from 10.2% last year to 9.9% this year.

10.2.12 Significant contributors to the 2007/08 results are:

- (a) Plain line reactive renewals (expenditures and volumes) have increased this year for the second year in a row;
- (b) Following from performance in previous years, automatic ballast cleaners (ABC) when used to deliver large volumes, continue to show considerable efficiencies;
- (c) The plain line renewals performance hit has been dominated by:
 - (i) 'Steel sleeper relay and re-rail' (2% efficiency on £107.5m);
 - (ii) 'Re-rail, resleeper, reballast, formation - Trax (all sleeper types)' (-8.9% inefficiency on £28.7m);
 - (iii) 'Drainage' (-59.3% inefficiency on 9.8m).

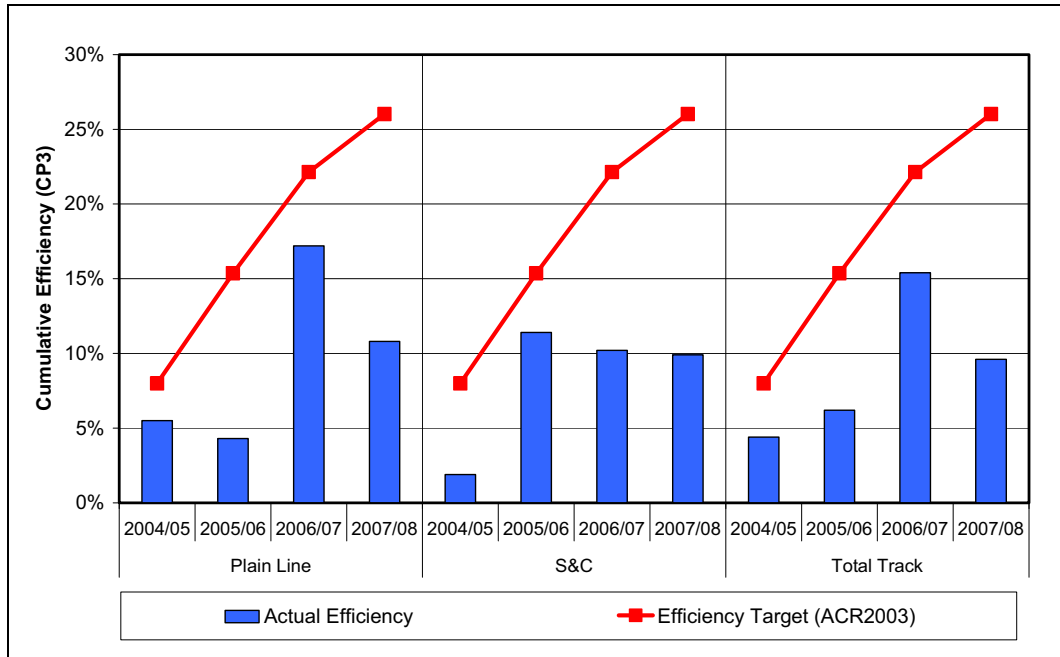


Figure 10.2.1 Efficiencies for Track Renewals (03/04 baseline)

Index (2003/04 = 100)	2004/05	2005/06	2006/07	2007/08	Efficiency from 06/07	Efficiency from 03/04
Track – plain line	94.5	95.7	82.8	89.2	-7.7%	+10.8%
Track – S&C	98.1	88.6	89.8	90.1	-0.3%	+9.9%
Track – total	95.6	93.8	84.6	90.4	-6.9%	+9.6%

Figure 10.2.2 Unit cost indices & Efficiencies for Track Renewals (+ve% = efficient)

Trend – composite rates

10.2.13 The 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 such as National Delivery Service. 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.

10.2.14 The track composite rates show plain line improving marginally to 10.6% for the Control Period and S&C up by 2.9% to 22.2% for the Control Period.

10.2.15 Comparing the unit cost data (Figure 10.2.2) and composite rates data (Figure 10.2.3) for efficiencies generated since 2003/04 suggests:

- (a) For plain line, spend on non-volume activity (including drainage, spot re-sleeping, depots and slab track in tunnels which totalled £220m in 2007/08) and work-mix have had a negative impact upon reported efficiency;
- (b) For S&C, work mix has had a large and positive effect upon reported efficiency.

Composite renewal rates at 07/08 prices	03/04	04/05	05/06	06/07	07/08	Efficiency from 06/07	Efficiency from 03/04
Plain line track (£k/ metre)	287	263	264	259	257	+0.8%	+10.6%
Switch & Crossing (£k/ equivalent unit)	623	556	499	499	485	+2.9%	+22.2%
Total						+1.5%	+13.2%

Figure 10.2.3 Composite Rates & Efficiencies for Track Renewals

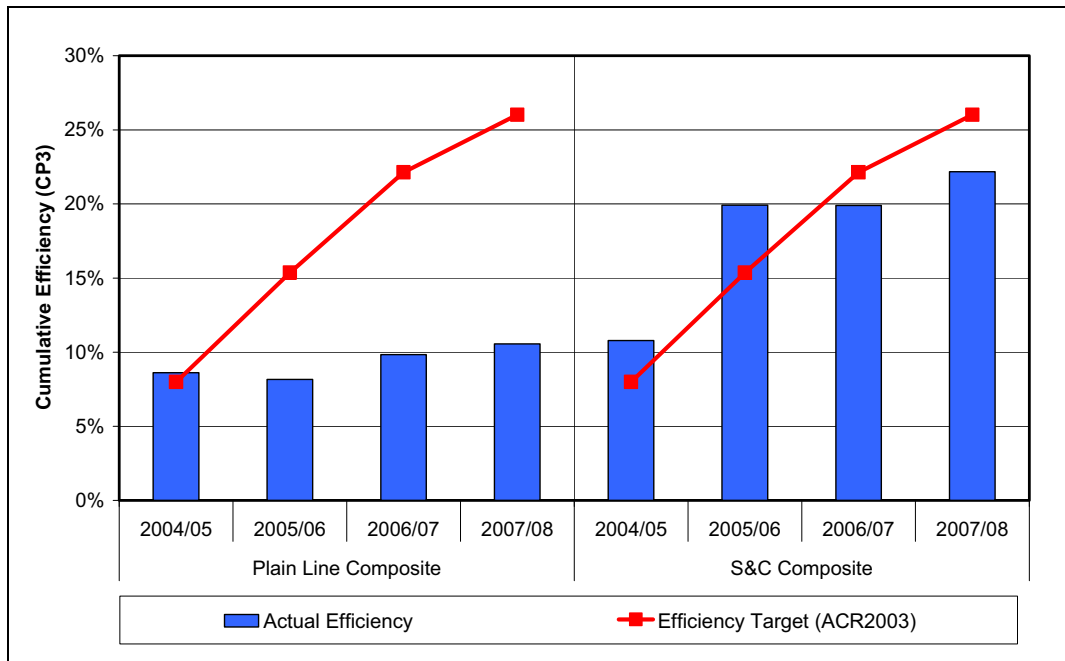


Figure 10.2.4 Composite Rates for Track Renewals (07/08 prices)

Findings

Process

- 10.2.16 The renewals unit costs and composite rates for track are reported through the MBR process. This data is collected and monitored by Territory Track Renewals Programme teams on a 4-weekly basis. The data is consolidated on a national basis by the national Track Renewals Programme team and monitored by Director Track Renewals and Head of Track.
- 10.2.17 Changes to the agreed business plan are jointly authorised at a delegated level within the national Track Renewals Programme team and Head of Track’s team, often at Territory level. Actuals, and any variances to the business plan, are monitored, explained and reported through the MBR process.

Data accuracy

- 10.2.18 The financial data is not solely based on final accounts for each track renewals project; final accounts take 12-16 weeks, so those projects reporting completion for unit costs and composite rates in the final quarter may be subject to approximately $\pm 5\%$ variation.
- 10.2.19 A desk audit of the calculation spreadsheets showed that the RPI rates used by Network Rail in the spreadsheets for unit costs to rebased prices from 2003/04 to 2007/08 are not consistent. The spreadsheets for structures, telecoms, signals and electrification & plant used 12.95%, the spreadsheets for track used 13.84% and independently sourced data from Network Rail Finance showed 14.78% (and which agrees with the data verified for the RAB volume incentive calculation, see section 10.4).

Assessment of confidence grade

- 10.2.20 **Reliability grade.** The processes used to source the data for this measure are documented, frequently used and subject to a number of layers of internal check and review and to external audit by others. 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.
- 10.2.21 **Accuracy grade.** The processes used to source the data for this measure are frequently used and subject to a number of layers of internal check and review and to external audit by others. The financial data is not solely based on final accounts, which may mean the reported data is subject to some inaccuracy. We have found a source of error and inconsistency from price rebasing. We therefore believe the unit cost indices and composite rates should have an accuracy grade of 3.

Audit Statement

- 10.2.22 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2008 for track unit cost indices and composite rates. The data has been assessed as having a confidence grade of B3.
- 10.2.23 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

- 10.2.24 **Track unit costs recommendation 1.** 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.

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

- 10.2.25 We have no observation for this measure.

Progress on outstanding recommendations from previous audit reports

- 10.2.26 There are no outstanding recommendations for this measure.

10.2C Renewals Unit Costs – Structures, Signalling & Telecoms

Audit scope

- 10.2.27 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2008, Section 6, Renewals Efficiency, including Tables 6.38-6.39.
- 10.2.28 The source data for this measure is Network Rail's Cost Analysis Framework (CAF) process. The data for this measure comprises:
- Unit costs for twenty-three renewal activities – nine for structures, seven for signalling, seven for telecoms – and for 'total' civils, signalling and telecoms renewals (i.e. the total of costs subject to analysis using unit costs);
 - The percentage efficiency savings based on these measures which can be compared with the regulatory targets for efficiency.
- 10.2.29 The preliminary data did not contain unit costs for Electrification & Plant as the work delivered in 2007/08 did not meet the requirements to constitute a repeatable work item (RWI); some costs were captured at a more detailed cost element (CE) level.
- 10.2.30 The audit was undertaken at Headquarters, comprising the Estimating team and Civils Renewals Programme team and Head of Investment Efficiency.

Commentary on reported data

Regulatory target

- 10.2.31 The regulatory target for 2007/08 efficiency savings is 26% (cumulative over the first four years of the Control Period). 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 10.2E below.

Change of price base

- 10.2.32 As discussed in section 10.2.19 below, we have found that the RPI rates used by Network Rail in the spreadsheets for unit costs are not consistent; we have therefore used the RPI data independently sent by Network Rail's Finance department to rebase prices from 2003/04 to 2007/08 for the 2007/08 data in this section; we have not changed previous year's reported data. The numbers below will therefore differ from those presented in the Annual Return.

Trend

- 10.2.33 Figure 10.2.5 shows Structures efficiency has improved by 1.5% this year to 26.4% over the Control Period. Telecoms efficiency has improved by 13.0% this year to 25.7%. Signalling efficiency has decreased significantly to 29.4% for the Control Period – this latter figure largely appears to be the unit cost settling as the data set expands.
- 10.2.34 Figure 10.2.6 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)	2004/05	2005/06	2006/07	2007/08	Efficiency from 06/07	Efficiency from 03/04
Structures	85.0	77.0	74.7	73.6	1.5%	26.4%
Signalling	n/a	n/a	57.5	70.6	-22.8%	29.4%
Telecoms	n/a	n/a	85.4	74.3	13.0%	25.7%

Figure 10.2.5 Unit Cost Indices & Efficiencies for Track Renewals

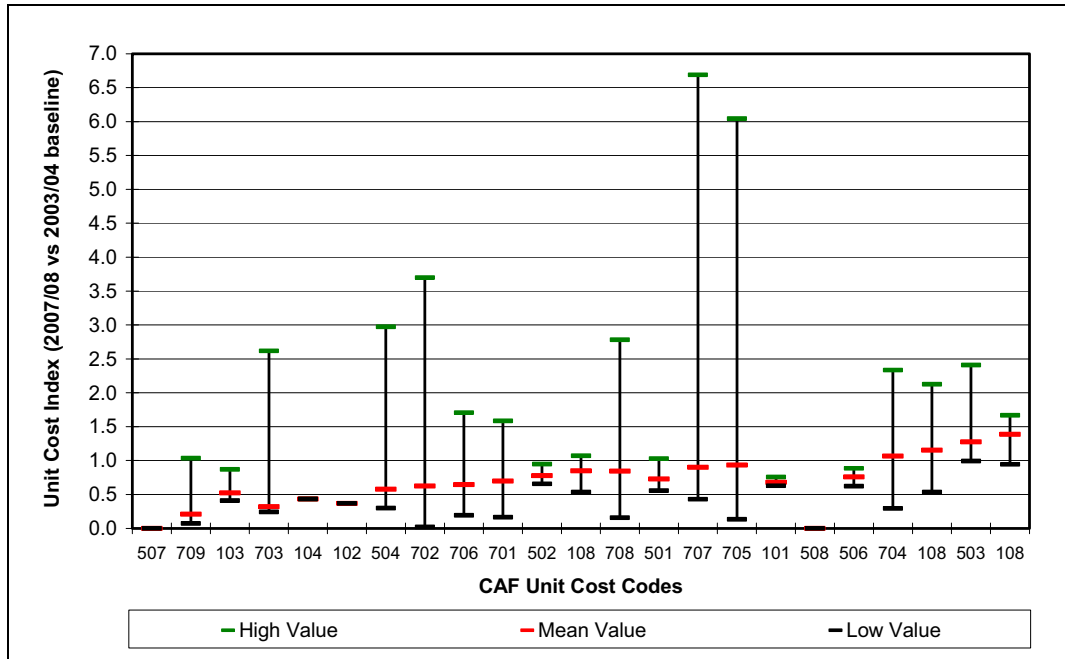


Figure 10.2.6 CAF Renewals Unit Costs (03/04 baseline)

Audit findings

Process

- 10.2.35 The 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.
- 10.2.36 For projects which undertake work falling within the definitions of the CAF repeatable work items, reports documenting key details of the work are produced using standard formats by members of project team. The reports are accepted as meeting the repeatable work item definition, rejected or returned for correction/further data by the Headquarters Senior Cost Analyst. The reasons for rejection are documented. Data from the report is entered into RIB (a database) from which the data is subsequently reported.
- 10.2.37 A sample of accepted and rejected CAF reports has been assessed; we found that the decision-making for these samples was sensible.

Data accuracy

- 10.2.38 **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, this means some projects completed in the last few periods of each year may be reported in the next year.
- 10.2.39 **Structures CAF.** As noted in section 8.3 of this report (Structures Renewal and Remediation Volumes – M23, M26-M29), the number of CAF returns are low for some Territories. Figure 10.2.7 shows Southern made CAF returns in 2007/08 for just 2.6% of its total renewals expenditure whilst LNE returned some 53.6%. This geographical skew has the potential to under-estimate the unit costs, due to the differential in labour costs across the country and estimates that labour represents some 60% of the total renewal cost. Network Rail calculations suggest that this under-estimate is of the order of 0.3-0.6%.

Territory	Value of CAF Reports for Structures Submitted in 2007/08				
	2006/07 value (£k)	2007/08 value (£k)	Total value (£k)	Full 2007/08 outturn (£k)	Variance (%)
London North Eastern	20,962	47,367	68,328	88,381	53.6%
London North Western	30,839	21,740	52,578	89,778	24.2%
Scotland	3,704	12,221	15,926	63,904	19.1%
South East	774	2,293	3,067	86,918	2.6%
Western	2,846	16,692	19,538	71,715	23.3%
Grand Total	59,125	100,313	159,438	400,696	25.0%

Figure 10.2.7 Value of CAF Returns for Structures

- 10.2.40 **Outliers.** A sample of outliers excluded from the final dataset has been assessed; we found that the decision-making for these samples was sensible.
- 10.2.41 **Price Base.** A desk audit of the calculation spreadsheets showed that the RPI rates used by Network Rail in the spreadsheets for unit costs to rebased prices from 2003/04 to 2007/08 are not consistent. The spreadsheets for structures, telecoms, signals and electrification & plant used 12.95%, the spreadsheets for track used 13.84% and independently sourced data from Network Rail Finance showed 14.78% (and which agrees with the data verified for the RAB volume incentive calculation, see section 10.4).

Assessment of confidence grade

- 10.2.42 **Reliability grade.** The processes used to source the data for this measure are documented, frequently used and subject to a number of layers of internal check and review and to external audit by others. 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.
- 10.2.43 **Accuracy grade.** The processes used to source the data for this measure are frequently used and subject to a number of layers of internal check and review and to external audit by others. 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

- 10.2.44 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2008 for structures, signalling and telecoms unit cost indices. The data has been assessed as having a confidence grade of B2.
- 10.2.45 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

- 10.2.46 **Structures, Signalling & Telecoms Renewals unit costs recommendation 1.** We recommend that Network Rail assesses the extent of any possible geographical skew for each Repeatable Work Item (RWI) and, if necessary, undertakes steps to mitigate this skew, such as monitoring the extent of geographical skew for CAF reports that are entered into the CAF database (RIB) or normalising the dataset where necessary.

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

- 10.2.47 We have no observation for this measure.

Progress on outstanding recommendations from previous audit reports

- 10.2.48 There are no outstanding recommendations for this measure.

10.2D Renewals Budget Variance

Audit scope

- 10.2.49 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2008, Section 6, Budget Variance Analysis, including Table 6.37.
- 10.2.50 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.
- 10.2.51 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.
- 10.2.52 We have shadowed Network Rail's internal audits of budget variance analysis for the investment programme teams undertaken by the finance controllers. We undertook a desk audit of the renewals variance attributions for Signalling, Telecoms and Electrification & Plant.

Commentary on reported data

Regulatory target

- 10.2.53 The regulatory target for 2007/08 efficiency savings is 26% (cumulative over the first four years of the Control Period). 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 10.2E below.

Trend

- 10.2.54 The total renewals budget shows an 18.3% level of efficiency, comprising strong performances in all asset classes except track which achieved 11.8% efficiency.

Category	2004/05 (%)	2005/06 (%)	2006/07 (%)	2007/08 (%)
Track incl. high output/ modular S&C	6	9.6	14.6	11.8
Signalling	14	29.7	26.3	20.9
Civils	12	26.6	20.8	26.9
Electrification, Plant & Machinery	7	37.7	26.3	18.0
Telecoms	12	17.8	36.3	32.2
Estates	8	24.1	33.5	17.8
Core renewals efficiency	9%	18.1%	22.1%	18.3%

Figure 10.2.8 Core renewals efficiency savings (03/04 baseline)

Audit findings

Changes to measure and process

- 10.2.55 One of the key findings in the 2006/07 variance audits addressed the definitions of the variance categories and use of the 'Scope Change' variance category. For 2007/08, Network Rail has changed the process:
- 'Scope Change' category has been eliminated;
 - 'Scope Efficiency' category has been created to cover changes in volume of activity in the original business plan;
 - 'Work deferred to CP4' category created to cover planned deferrals into CP4;

- (d) 'Work Re-prioritised in the Control Period' category created to incorporate the former category 'Work Brought Forward in the Control Period' and other changes to the work bank that occur within the control period (e.g. sponsor driven changes).

10.2.56 Consequently the definitions in the procedure have been updated. The procedure also contains a very useful table identifying (a) the major change drivers for budgets and expenditures associated with each project stage (GRIP) and (b) the variance categories associated with each of these change drivers. This clarity should improve the accuracy of attribution to variance categories.

Process

10.2.57 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.

10.2.58 Renewals project budgets are tracked during the year using Oracle Projects and Budget Variance Analysis spreadsheets:

- (a) **Forecast variances** between the full-year forecast and current annual budget are automatically reported in Oracle Projects;
- (b) **Banked variances** between the year-commencing budget and the current annual budget are recorded manually by Infrastructure Investment teams using Budget Variance Analysis spreadsheets.

10.2.59 The Infrastructure Investment teams use change control processes to authorise budget changes and/or movements in expenditure and attribute them to a variance category.

10.2.60 Programme Controls Managers in Infrastructure Investment teams are responsible for the Change Log process and ensuring evidence is available for the annual audits; authorised change request forms are the primary documentary evidence to support variance attribution.

10.2.61 Financial variances for each project are reported each period in the Monthly Business Review (MBR) packs. Variances greater than £250k are reported using a commentary; variances less than £250k are rolled-up and reported as consolidated figure.

10.2.62 The year-end data is audited by finance controllers, shadowed by Independent Reporters. Required evidence for the internal audits is shown in Figure 10.2.9.

Variance category	Criteria	Evidence required
Previous years unbudgeted rollover	Evidence projects were live in 2004/5 and the reported rollover is the delta between actual cost and original budget	OP or Budget spreadsheet
Scope changes	Authorised at Renewals Investment Panel (RIP) or equivalent (not projects where funding brought forward from later in CP, not reductions where volume has slipped later into CP)	RIP minute or Authorised Change Request forms
Work brought forward, funded later in CP	Evidence that works were funded later in CP in 2005/06 Business Plan, and supporting RIP paper	RIP minute or Authorised Change Request forms
Activity efficiency	Credible commentary of source of efficiency to be supplied in MBR report on project by project basis	Efficiency log or sufficient commentary to explain principal sources
Planned slippage to maximise efficiency	Must relate to conscious decisions to re-plan, agreed at MBR/ RIP or equivalent senior level forum	MBR minute or investment authority paper/ minute or equivalent
Slippage due to third party	Must be explicitly driven by instruction from third party	Third party correspondence or meeting minute
Unplanned slippage	All other causes; should correlate with roll-over provisions declared in business plan for 2006/07 or later	Provision in next year's business plan

Figure 10.2.9 Evidence for correct variance attribution

- 10.2.63 The audited data is input to the efficiency model in order to calculate the level of forecast efficiency achieved.

Assessment of confidence grade

- 10.2.64 **Reliability grade.** The procedure for this measure is documented. However, there was evidence of the categorisation process not being followed correctly. We believe the renewals budget variance analysis should have a reliability grade of B.
- 10.2.65 **Accuracy grade.** There was evidence of systematic errors leading to over-attribution to Scope Change. The internal audit by Network Rail led to re-attribution of some variances demonstrating a success for this method of quality assurance; however, as this process was undertaken post-audit using limited information it is possible that not all cases have been correctly identified. We believe the renewals budget variance analysis should have an accuracy grade of 2.

Audit Statement

- 10.2.66 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2008 for variance analysis of the renewals budget. We believe the maintenance unit cost data should have an accuracy band of B2.
- 10.2.67 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

- 10.2.68 We have no recommendations for this measure.

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

- 10.2.69 We have no observation for this measure.

Progress on outstanding recommendations from previous audit reports

- 10.2.70 There are no outstanding recommendations for this measure.

10.2E Comparison of results with regulatory targets

Introduction

10.2.71 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

10.2.72 The regulatory target for 2007/08 efficiency savings is 26% (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%).

10.2.73 Figure 10.2.10 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	11.8	13.2	Not met
Signalling	20.9	30.5	Indeterminate
Structures	26.9	27.6	Met
Electrification, Plant & Machinery	18.0	n/a	Met
Telecoms	32.2	26.9	Met
Estates	17.8	n/a	Not met
Total	18.3%	16.3	Not met

Figure 10.2.10 Core renewals efficiency savings (03/04 baseline)

Audit Statement

10.2.74 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. We concur with Network Rail's conclusion that it looks unlikely the ORR target of 31% reduction in renewals costs in Control Period 3 will be met.

Recommendations arising

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

10.2.75 **Renewal unit costs recommendation 1.** We recommend that Network Rail use consistent RPI rates for rebasing prices or reference the appropriate inflation indices in the Annual Return and/or calculation spreadsheets if other indices are used.

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

10.2.76 We have no observation for this measure.

Progress on outstanding recommendations from previous audit reports

10.2.77 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 2008, Section 7, Debt to RAB Ratio, including Table 7.1.
- 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%.
- 10.3.5 The results for 2006/07 show that Network Rail's net debt as a percentage of its RAB was 69.4% which meets the requirements of its Network Licence.

Trend

- 10.3.6 As at 31 March 2008, the Regulatory Accounts show RAB as £27,942m and net debt as £19,381m. The ratio of net debt to the RAB has fallen by 5.1% in comparison with the previous year.

	2004/05	2005/06	2006/07	2007/08	% Variance on 2006/07
Debt/RAB	77.2%	78.1%	73.5%	69.4%	-5.1%

Figure 10.3.1 Material Variance of Actuals and Business Plan Forecast for Renewals

- 10.3.7 The Business Plan target of 73.1% was not achieved due to higher than forecast RAB inflation, grant income reprofiling and lower than forecast debt-funded expenditure.

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 2008.

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 2008 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 2008, Section 7, RAB Volume Incentives, including Table 7.2.
- 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 forecast RAB adjustment for Control Period 3 reported in the Annual Return and the Regulatory Accounts is £382.6m (2007/08 prices).

Audit Findings

Process

- 10.4.7 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:
- (a) 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;
 - (b) For the freight incentive, the baseline volume comprises actual freight train miles and freight gross tonne miles (GTM).
- 10.4.8 In respect of the data for the calculation:
- (a) The actual passenger revenue data comes from ORR's National Rail Trends Yearbook 2006/07;
 - (b) The forecast 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;
 - (c) 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 forecast train mileage and tonnage data comes from Network Rail's Business Plan (Polkadot model).

- 10.4.9 This year, however, the calculation has not been undertaken using actuals; forecasts for 2007/08 have been used to up-rate the 2006/07 calculation instead:
- (a) 2007/08 growth forecast for Passenger Revenue taken from in ATOC's Rail Revenue Headline Results (09 December 2008 to 05 January 2008);
 - (b) 2007/08 growth forecast for Passenger Train Miles based on Palladin 2007/08 period 10 data;
 - (c) 2007/08 growth profile for Freight Goss Tonne Miles and Freight Train Miles taken from Network Rail's March 2007 Business Plan.

Data accuracy

- 10.4.10 **Forecast not actuals.** The RAB Volume Incentive calculation would normally become more accurate in each year of the control period as the number of forecast years is reduced; this is not the case this year, as 2007/08 actuals have not been used in the calculation. Notwithstanding, the forecast values appear sensible.
- 10.4.11 We understand that this was driven by an unusually early requirement for the RAB Volume Incentive figure for the Regulatory Accounts. This will not be possible next year, as the calculation will need to be finalised after year end using actuals for the end of the control period.
- 10.4.12 **Spreadsheet.** The formulae in the spreadsheet to calculate the RAB Volume Incentive are correct. The price rebasing is slightly unusual in that calculation was undertaken earlier in 2008 when the forecasts for inflation were lower; the updated index has not been used for the Annual Return as the previous figures have already been published in the Regulatory Accounts.
- 10.4.13 **Changed Freight Baseline.** As in previous years, the baselines used 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:
- (a) The time period has altered to include the day after period end; and
 - (b) There have been changes to the chargeable freight service groups.
- 10.4.14 This has resulted in a 0.26% increase in the baseline for the freight train miles and 0.765% increase in the freight gross tonne miles, which in the context of the volume incentive calculation is not in Network Rail's favour.
- 10.4.15 Similar to last year, we requested further explanation of the rebaselining, including the new method of calculating the freight train mileage and tonnage datasets, but at the time of writing these were not available.

Assessment of confidence grade

- 10.4.16 **Reliability grade.** This is an indicative measure only; the incentive payment will be calculated at year-end 2008/09. The actual and forecast data are 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 band of B.
- 10.4.17 **Accuracy grade.** Some of the data used is forecast. 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 band of 3.

Audit Statement

- 10.4.18 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2008 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

- 10.4.19 **RAB Volume Incentives recommendation 1.** 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.

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

- 10.4.20 We have no observation for this measure.

Progress on outstanding recommendations from previous audit reports

- 10.4.21 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
2007-R46: We recommend the specifications of the input data and subsequent calculations are recorded and agreed with ORR.	We have seen no progress. Current Status – Repeated in later year

Figure 10.4.1 Progress on outstanding recommendations for RAB Volume Incentive

11 Reporter's scrutiny and opinion

11.1 Commentary on Annual Return 2008

Overview

- 11.1.1 I am pleased to report we have experienced co-operation at all levels within Network Rail which has allowed our audit report to be delivered to schedule. Where additional supporting information has been requested by the audit teams it has in all cases been made available. 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.
- 11.1.2 We believe the Annual Return should be regarded as a consolidated report on the delivery of regulatory measures and specific targets. Taken in this context the Annual Return satisfies that objective. The suite of measures and targets, as currently 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.
- 11.1.3 The figures contained in the Annual Return 2008 indicate that Network Rail has achieved the required regulatory targets with the exception of:
- (a) Earthworks Failures (M6);
 - (b) Electrification Condition – D.C. traction contact systems (M16); and
 - (c) Renewals Efficiency
- 11.1.4 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. This year, however, we have undertaken a sensitivity test on Network Rail's achievement of the targets against the confidence grading assigned by us. The findings are referred to below and given in detail in the main body of this report.

Data Quality Issues

- 11.1.5 We have found little improvement in the quality and accuracy of the data provided by Network Rail for the purposes of our audits or presented in their Annual Return.
- 11.1.6 In two instances we have sufficient concerns to have downgraded the confidence level of the reported measure from that in our 2007 Audit Report:
- (a) Bridge Condition (M8); and
 - (b) Structures Renewal & Remediation Volumes (M23, M26-29)
- 11.1.7 Our auditors concluded that insufficient management oversight and resource in area of the business relating to the stewardship of the bridge assets has led to the data definition and validation procedures not being followed and deterioration in the reliability and accuracy of the data provided.
- 11.1.8 In the case of the latter measure, our auditors further discovered that data collection delays and deficiencies in the CAF data collection process itself had led the reported data being supplemented by Business Plan data, raising concerns over its overall validity.
- 11.1.9 We have made a number of recommendations to address the process and data quality deficiencies and we will be following these up during the year.
- 11.1.10 We also express our concern over the reliability or quality of the data associated with the following measures
- (a) Earthworks Failures (M6) – we have concerns that application of the revised definition contained in the Asset Reporting Manual will lead to a continued gross

under-reporting of incidences of failure, particularly where there are wide-area, multiple asset and multiple instance failures (such as that encountered with flooding)

- (b) Signalling Failures (M9) – we found systematic errors in definition leading to consistent over-reporting
- (c) Light Maintenance Depot Condition Index (M19) – we found discrepancies in condition reports and shortcomings in process
- (d) Signalling Renewals (M24) – we found that SEU calculations were open to interpretation
- (e) Efficiency: Maintenance Unit Costs – we have continued concern over the current reliability and accuracy of available MUC data

11.1.11 This year we have undertaken a sensitivity test on Network Rail's achievement of the regulatory targets against the confidence grading assigned by us. In two instances where Network Rail currently achieves the regulatory target, viz: Total Network Rail caused delay (million minutes) and Light maintenance depot – condition index (M19), if we were to take into account the accuracy of the data provided, the margin of achievement would be eroded such that it would then indicate a failure to achieve the target. The findings are given in detail in the main body of this report (Section 4.3).

Nature of Regulatory & Other Targets

11.1.12 As Reporter A, we has 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.

11.1.13 In undertaking our audit programme it is clear to us 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 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.

11.1.14 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.

11.1.15 We restate our considered opinion, given in last year's report, that the specific regulatory targets and performance KPIs for which asset condition and performance data is obtained should, for the next Control Period, be much more closely aligned with widely-accepted asset management performance indicator conventions and with Network Rail's business management needs. Adopting this approach would, in our view, provide both Network Rail and ORR with the ability to obtain more relevant and timely infrastructure asset condition and performance information upon which Network Rail's performance could be judged, both internally and by its stakeholders. At the same time this approach would focus the collective efforts of all concerned on the ground and at Headquarters in Network Rail on the exercise of effective asset management practices and on positively ensuring compliance with (or bettering) regulatory and specific targets. We do not believe that additional resource or time penalty would be incurred.

11.2 Reporter's Audit Statement

- 11.2.1 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 the Annual Return 2008 gives a representative view and whether the data reported by Network Rail is consistent with evidence provided to us at audit.
- 11.2.2 We confirm Network Rail has prepared the Annual Return for 2008 in accordance with its regulatory and statutory obligations using procedures prepared by Network Rail and agreed with Office of Rail Regulation.
- 11.2.3 We confirm the Annual Return 2008 was submitted in accordance within the timescale required by Condition 15 of Network Rail's Network Licence.
- 11.2.4 We confirm we have completed audits of the data contained in the Annual Return 2008 relating to the measures contained in the "Form of the 2008 Annual Return" prepared by Network Rail and agreed with the Office of Rail Regulation as per 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 2008. 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 2008.
- 11.2.5 We confirm that, in our opinion, the reported information is a reasonable representation of performance and data has been properly prepared and reported in accordance with agreed procedures, except as specifically identified in our report commentaries.

David Simmons

David Simmons,
Independent Reporter,
Halcrow Group Limited,
August 2008.

12 Appendix A: Table of figures

Figure 1.3.1	Confidence grades targets and results for measures in Annual Return 2008	15
Figure 3.1.1	Allocation of Reporting Role to Reporters.....	19
Figure 4.2.1	Performance against regulatory targets in Annual Return 2008.....	22
Figure 4.3.1	Confidence grades for the measures in Annual Return 2008.....	23
Figure 5.1.1	Delay Minutes per 100 train kilometres.....	28
Figure 5.1.2	Number of infrastructure incidents per Route recorded for delay attribution	29
Figure 5.1.3	Average delay minutes per incident.....	30
Figure 5.1.4	Progress on outstanding recommendations for Operational Performance.....	32
Figure 5.2.1	Customer & Supplier Satisfaction	34
Figure 5.2.2	Progress on outstanding recommendations for Customer and Supplier Satisfaction.....	37
Figure 5.3.1	Progress on outstanding recommendations for Joint Performance Process (JPP).....	40
Figure 6.1.1	Linespeed capability (speed band in mph, capability per annum reported in km) (C1)	43
Figure 6.2.1	Gauge capability (kilometres) (C2).....	46
Figure 6.2.2	Progress on outstanding recommendations for gauge capability (C2).....	48
Figure 6.3.1	Structures route availability (C3).....	49
Figure 6.4.1	Electrification capability (C4).....	51
Figure 6.4.2	Progress on outstanding recommendations for electrified track capability (C4).....	52
Figure 6.5.1	Train Mileages (million miles; empty coaching stock excluded)	53
Figure 6.5.2	Progress on outstanding recommendations for Mileage.....	55
Figure 6.6.1	Freight Gross Tonne Miles.....	56
Figure 6.7.1	Late Disruptive Possessions by Territory including WCRM.....	58
Figure 6.7.2	Late Disruptive Possessions by Territory excluding WCRM.....	59
Figure 7.1.1	Number of broken rails (M1)	63
Figure 7.1.2	Number of broken rails by Territory (M1)	64
Figure 7.1.3	Rail breaks per 1000 equated track miles (M1)	65
Figure 7.1.4	Progress on outstanding recommendations for Broken Rails (M1)	67
Figure 7.2.1	Numbers of isolated rail defects (M2)	69
Figure 7.2.2	Length of continuous rail defects (M2).....	69
Figure 7.2.3	Progress on outstanding recommendations for Rail Defects (M2)	72
Figure 7.3.1	National SD data (M3).....	73
Figure 7.3.2	Track geometry standard deviation 2003/04 – 2007/08 (M3)	74
Figure 7.3.3	A comparison of Route PTG 2003/04 - 2007/08 (M3)	75
Figure 7.3.4	Speed band standard deviations (M3)	75
Figure 7.3.5	Level 2 exceedences for 2003/04 - 2007/08 (M5)	76
Figure 7.3.6	Progress on outstanding recommendations for Track Geometry (M3 & M5)	77
Figure 7.4.1	Number and severity of temporary speed restrictions (M4).....	79
Figure 7.4.2	Variance in Severity Score and Number of TSRs (M4)	79
Figure 7.4.3	Number of temporary speed restrictions (M4); grouped for comparison (M4).....	80
Figure 7.4.4	Severity of temporary speed restrictions (M4) ; grouped for comparison (M4).....	80
Figure 7.4.5	Progress on outstanding recommendations for Condition of asset temporary speed restriction sites (M4)	84
Figure 7.5.1	Number of Earthwork failures reported during the last five years (M6)	85
Figure 7.5.2	Variance of Earthwork failures (M6).....	86
Figure 7.5.3	Incidents by Hazard Score (M6).....	86
Figure 7.5.4	Progress on outstanding recommendations for earthwork failures (M6)	88
Figure 7.6.1	average SCMI band and SCMI score for structures examined since April 2003.....	90
Figure 7.6.2	Bridge condition reported during the last five years (M8)	90
Figure 7.6.3	Average Number of Days from Examination to Entry into SCMI by Territory (M8).....	92
Figure 7.6.4	Progress on outstanding recommendations for bridge condition (M8)	95
Figure 7.7.1	Number of signalling failures >10 minutes (M9).....	96
Figure 7.7.2	Progress on outstanding recommendations for signalling failures (M9).....	99
Figure 7.8.1	Average signalling asset condition (M10)	101
Figure 7.8.2	Average Level Crossing condition for 2007/08 (M10).....	101
Figure 7.8.3	Progress on outstanding recommendations for Signalling Asset Condition (M10).....	104

Figure 7.9.1	Traction power incidents causing over 500 train delay minutes (M11 & M12)	106
Figure 7.9.2	Number of a.c. and d.c. Incidents causing over 500 minutes delay (M11 & M12)	106
Figure 7.9.3	Comparison of a.c. and d.c. Incidents by Failure Analysis Category (M11 & M12)	107
Figure 7.9.4	Progress on outstanding recommendations for Traction power incidents (M11 & M12)	109
Figure 7.10.1	Average condition - a.c. traction feeder stations & track sectioning points (M13)	110
Figure 7.10.2	condition a.c. traction feeder stations & track sectioning points (M13)	111
Figure 7.10.3	Progress on outstanding recommendations for Electrification condition – a.c. traction feeder stations and track sectioning points (M13)	114
Figure 7.11.1	Average condition of d.c. sub-stations (M14)	115
Figure 7.11.2	Average condition grade for d.c. sub-stations (M14)	116
Figure 7.11.3	Progress on outstanding recommendations for Electrification condition – d.c. substations (M14)	118
Figure 7.12.1	a.c. traction contact systems (M15)	119
Figure 7.12.2	Average condition grade of a.c. traction contact systems (M15)	120
Figure 7.12.3	Progress on outstanding recommendations for a.c. traction contact systems (M15)	122
Figure 7.13.1	Average condition of conductor rails (M16)	123
Figure 7.13.2	Average condition of conductor rails (M16)	124
Figure 7.14.1	Average condition of Stations (M17)	126
Figure 7.14.2	Station condition (either SCI or SSM) reported during the last five years (M17)	127
Figure 7.14.3	Spread of SSM Scores across grades by Territory (M17)	129
Figure 7.14.4	Progress on outstanding recommendations for Station Stewardship Measure (M17)	131
Figure 7.15.1	Average condition of LMD (M19)	133
Figure 7.15.2	Average LMD asset condition (M19)	133
Figure 7.15.3	Progress on outstanding recommendations for Light maintenance depot – condition index (M19)	135
Figure 7.16.1	Asset Stewardship Incentive Index (ASII)	136
Figure 7.16.2	Checks performed for ASII using data sourced from Annual Return 2008 (ASII)	137
Figure 8.1.1	Track renewal volumes excl. WCRM (M20, M21, M22)	141
Figure 8.1.2	Switch and crossing full renewals excl. WCRM (M25)	142
Figure 8.1.3	Switch and crossing renewal excl. WCRM by type (M25)	142
Figure 8.1.4	Progress on outstanding recommendations for track renewals measures (M20, M21, M22, M25)	145
Figure 8.2.1	Signalling renewals (M24)	146
Figure 8.2.2	Progress on outstanding recommendations for Signalling Renewed (M24)	148
Figure 8.3.1	Number of renewal volumes reported from CAF and the Business Plan in Annual Return 2008 (M23, M26-M29)	150
Figure 8.3.2	Activity volumes by Territory for 2007/08 (excluding business plan volumes)	150
Figure 8.3.3	Progress on outstanding recommendations for civils renewals and remediation measures (M23, M26- M29)	152
Figure 9.1.1	Data flow for reporting (Safety)	157
Figure 10.1.1	Maintenance expenditure efficiency savings	172
Figure 10.1.2	Maintenance NST Ellipse data quality (Periods 1 to 12, 2007/08)	176
Figure 10.1.3	2007/08 Territory Maintenance Unit Costs as a percentage of National Maintenance Unit Costs	177
Figure 10.1.4	Progress on outstanding recommendations for Maintenance	179
Figure 10.2.1	Efficiencies for Track Renewals (03/04 baseline)	182
Figure 10.2.2	Unit cost indices & Efficiencies for Track Renewals (+ve% = efficient)	182
Figure 10.2.3	Composite Rates & Efficiencies for Track Renewals	183
Figure 10.2.4	Composite Rates for Track Renewals (07/08 prices)	183
Figure 10.2.5	Unit Cost Indices & Efficiencies for Track Renewals	185
Figure 10.2.6	CAF Renewals Unit Costs (03/04 baseline)	186
Figure 10.2.7	Value of CAF Returns for Structures	187
Figure 10.2.8	Core renewals efficiency savings (03/04 baseline)	188
Figure 10.2.9	Evidence for correct variance attribution	189
Figure 10.2.10	Core renewals efficiency savings (03/04 baseline)	191
Figure 10.3.1	Material Variance of Actuals and Business Plan Forecast for Renewals	192

Figure 10.4.1 Progress on outstanding recommendations for RAB Volume Incentive 196

Figure 16.1.1 Results by measure (2004/05-2007/08), and performance against CP3 Regulatory targets 219

Figure 17.1.1 Confidence Grades assigned to Annual Return Measures (2004/05 – 2007/08) 221

Figure 17.2.1 Notable variation for 2006/07-2007/08 Independent Reporter confidence grades .. 223

Figure 18.1.1 Changes to measures reported in the Asset Reporting Manual 225

Figure 19.1.1 Measures reported in both Network Rail Monitor and Annual Return 227

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]
ARM	Asset Reporting Manual
ARME	Area Rail Management Engineer
ASII	Asset Stewardship Incentive Index
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 2014 (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
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
HRMS	Human Resource Management System
IDC	Interlocking Data Cards
IFC	Infrastructure Fault Control
IM	Information Management

Acronym	Meaning
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
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
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
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
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

Acronym	Meaning
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
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
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
19/02/08	40 Melton Street	M6	<ul style="list-style-type: none"> Eifion Evans, Civil Engineer (Geotechnics) 	<ul style="list-style-type: none"> Nicola Nortcliffe Mike Adkin
21/02/08	40 Melton Street	M3&M5	<ul style="list-style-type: none"> Tim Fuller, Acting National Track Geometry & Gauging Engineer John Turner, National Engineering Information Analyst Richard Enwezop, Year in Industry Student 	<ul style="list-style-type: none"> Nicola Nortcliffe Phil Edwards
27/02/08	40 Melton Street	Mileage	<ul style="list-style-type: none"> John Kennedy, Regulatory Economist 	<ul style="list-style-type: none"> Vidhi Mohan
03/03/08	40 Melton Street	M20-M22, M25	<ul style="list-style-type: none"> Andy Jones, Strategy Engineer (Track) 	<ul style="list-style-type: none"> Vidhi Mohan Phil Edwards
03/03/08	40 Melton Street	M17&19	<ul style="list-style-type: none"> Tim Stringer, Asset Performance Engineer – Operational Property 	<ul style="list-style-type: none"> Megan Gittins Cliff Buckton
04/03/08	40 Melton Street	M9	<ul style="list-style-type: none"> Ian Griffiths, Senior Signal Performance Engineer 	<ul style="list-style-type: none"> Megan Gittins Phil Morton
04/03/08	40 Melton Street	M8	<ul style="list-style-type: none"> Steve Fawcett, Civil Examinations Engineer Angelique Tjen, Regulatory Specialist Bob Heron, SCMI Specialist 	<ul style="list-style-type: none"> Nicola Nortcliffe Mike Adkin
05/03/08	40 Melton Street	M11-16	<ul style="list-style-type: none"> Nick Snell, Strategy Engineer E&P David McQuillan, Systems Acceptance Engineer (E&P) Glen Wiles, Contact Systems Engineer (E&P) Rachel Evans, Assistant Business Planning Engineer Mary Jordan, Engineering Reporting Manager 	<ul style="list-style-type: none"> Megan Gittins James Webb
05/03/08	40 Melton Street	Safety & Environment	<ul style="list-style-type: none"> Julian Lindfield, Director, Safety and Compliance Rod Reid, Head of Health and Safety Systems 	<ul style="list-style-type: none"> Nicola Forsdike Emma Craig
06/03/08	40 Melton Street	M1&M2	<ul style="list-style-type: none"> Brian Witney, National Rail Management Engineer Mary Jordan, National Engineering Reporting Manager 	<ul style="list-style-type: none"> Nicola Nortcliffe Phil Edwards
07/03/08	40 Melton Street	Safety & Environment	<ul style="list-style-type: none"> Diane Booth, Head of Environment Policy 	<ul style="list-style-type: none"> Nicola Forsdike Emma Craig
12/03/08	40 Melton Street	Maintenance Expenditure and MUC	<ul style="list-style-type: none"> Erwin Klumpers, Programme Manager (Change) 	<ul style="list-style-type: none"> Duncan Mills
12/03/08	40 Melton Street	MUC	<ul style="list-style-type: none"> Erwin Klumpers, Programme Manager (Change) 	<ul style="list-style-type: none"> Duncan Mills
13/03/08	40 Melton Street	C1, C2, C3, C4	<ul style="list-style-type: none"> Mary Jordan, National Engineering Reporting Manager 	<ul style="list-style-type: none"> Vidhi Mohan
14/03/08	40 Melton Street	M24	<ul style="list-style-type: none"> Richard McCulloch, Lead Development Mgr, Western & ERTMS Paul Mann, Signalling Strategy Engineer Brian Hatfield, Network Monitoring Manager (ORR) 	<ul style="list-style-type: none"> Vidhi Mohan Phil Morton
17/03/08	40 Melton Street	M10	<ul style="list-style-type: none"> Paul Mann, Signalling Strategy Engineer 	<ul style="list-style-type: none"> Megan Gittins Phil Morton

Date	Venue	Audit	For Network Rail (or Other)	For Reporter A
17/03/08	Waterloo Station	M23, M26-M29	<ul style="list-style-type: none"> Robert Oswald, Programme Efficiency Analyst Jonathan Evans, Civil Eng Business Manager Brian Hatfield, Network Monitoring Manager (ORR) Angelique Tjen, Regulatory Specialist Andy Lundberg, Business Improvement Mgr, Civils 	<ul style="list-style-type: none"> Vidhi Mohan Mike Adkin
01/04/08	Carolyn House, Croydon	M9	<ul style="list-style-type: none"> Harry Brown, Area Signals Engineer (Sussex) Nick Whiting, SINCS Engineer Paul Percival, Area Performance Engineer (Sussex) 	<ul style="list-style-type: none"> Megan Gittins Phil Morton
02/04/08	40 Melton Street	Customer Satisfaction	<ul style="list-style-type: none"> Peter Allen, Senior Market Research Specialist Angelique Tjen, Regulatory Specialist 	<ul style="list-style-type: none"> Nicola Forsdike
26/03/08	ORR Office, One Kemble St	Supplier Satisfaction	<ul style="list-style-type: none"> Peter Allen, Senior Market Research Specialist Angelique Tjen, Regulatory Specialist 	<ul style="list-style-type: none"> Nicola Forsdike
03/04/08	Waterloo Station	M6 Southern	<ul style="list-style-type: none"> Derek Butcher, Territory Geotechnical Engineer Simon Abbott, Earthworks Assessment Engineer 	<ul style="list-style-type: none"> Nicola Nortcliffe Mike Adkin
04/04/08	London Waterloo, Suite 2	C1 SEA	<ul style="list-style-type: none"> Ian Rush, Data Quality Manager 	<ul style="list-style-type: none"> Vidhi Mohan
07/04/08	Waterloo Station	M8 Southern	<ul style="list-style-type: none"> Sharon Lee, Territory Structures Engineer Steve Fawcett, Civil Examinations Engineer Innes Brown, Structures Management Engineer Nigel Ricketts (part), Territory Civil Engineer Phil Pearson, SEC (Atkins) Alan Martin, SEC (Amey) Mariella Tsopela, SEC (Amey) Angelique Tjen, Regulatory Specialist 	<ul style="list-style-type: none"> Nicola Nortcliffe Mike Adkin
08/04/08	Northern House, York	M9	<ul style="list-style-type: none"> Jim Cowan, Area Signal Engineer North East David Kerr, Signal Performance Engineer Brian Eves, SINCS Engineer Brian Hatfield, Network Monitoring Manager (ORR) 	<ul style="list-style-type: none"> Megan Gittins Phil Morton
09/04/08	George Stevenson House, York	M10	<ul style="list-style-type: none"> Ron Bowes, Signalling Assessment Engineer Bill Troth, Signal Renewals Engineer 	<ul style="list-style-type: none"> Megan Gittins Phil Morton
11/04/08	George Stevenson House, York	M8 LNE	<ul style="list-style-type: none"> Richard Frost, Territory Structures Engineer Brian Wainwright, Territory Assurance Engineer (Civils) Richard Sykes, SCMI Champion Steve Fawcett, Civil Examinations Engineer 	<ul style="list-style-type: none"> Nicola Nortcliffe Mike Adkin

Date	Venue	Audit	For Network Rail (or Other)	For Reporter A
11/04/08	George Stevenson House, York	M6 LNE	<ul style="list-style-type: none"> David Anderson, Territory Geotechnical Engineer Brian Wainwright, Territory Assurance Engineer (Civils) 	<ul style="list-style-type: none"> Nicola Nortcliffe Mike Adkin
11/04/08	The Mailbox, Birmingham	M10	<ul style="list-style-type: none"> Peter Gorry, Signal Renewal Assessment Engineer Graham Wire, Territory Renewals Engineer (Signals) 	<ul style="list-style-type: none"> Megan Gittins Phil Morton
14/04/08	Buchanan House, Glasgow	M6 Scotland	<ul style="list-style-type: none"> Jim Brown, Territory Geotechnical Engineer Grant Lisk, Territory Assurance Engineer (Civils) David Grant, Senior Earthworks Management Engineer 	<ul style="list-style-type: none"> Nicola Nortcliffe Mike Adkin
14/04/08	Buchanan House, Glasgow	M8 Scotland	<ul style="list-style-type: none"> Andrew Anderson, Territory Structures Engineer Grant Lisk, Territory Assurance Engineer (Civils) Matthew Elliot, Assistant Structures Management Engineer Steve Fawcett, Civil Examinations Engineer Mark Johnstone, SEC (Atkins) 	<ul style="list-style-type: none"> Nicola Nortcliffe Mike Adkin
14/04/08	Waterloo Station	M11,12&16	<ul style="list-style-type: none"> Cliff Eelsey, Territory Engineer E&P, SEA Marc Alderman, HV Coordinator (National Specialist Team) 	<ul style="list-style-type: none"> Megan Gittins James Webb
15/04/08	Waterloo Station	M17&19	<ul style="list-style-type: none"> Geoff Thorpe, Project Manager John Mottershead, Project Manager 	<ul style="list-style-type: none"> Megan Gittins Cliff Buckton
15/04/08	Waterloo – Interserve Offices	M17	<ul style="list-style-type: none"> Lewis Jones, Territory Project Manager Paul Mathews, Senior Building Surveyor (Interserve) 	<ul style="list-style-type: none"> Megan Gittins Cliff Buckton
16/04/08	Manchester Square One	M6 LNW	<ul style="list-style-type: none"> Julian Harms, Territory Geotechnical Engineer Steve Cowser, Territory Assurance Engineer (Civils) 	<ul style="list-style-type: none"> Nicola Nortcliffe Mike Adkin
16/04/08	Manchester Square One	M8 LNW	<ul style="list-style-type: none"> Neil Jones, Territory Structures Engineer Steve Cowser, Territory Assurance Engineer (Civils) Ian Fairfoot, Structures Management Engineer Dave Ashdown, SEC (Mouchel) Paul McCoy, SEC (Mouchel) Steve Fawcett, Civil Examinations Engineer 	<ul style="list-style-type: none"> Nicola Nortcliffe Mike Adkin
16/04/08	Buchanan House, Glasgow	M10	<ul style="list-style-type: none"> Martin Toms, Signal Renewal Assessment Engineer Guy Whaley, Territory Renewals Engineer (Signals) 	<ul style="list-style-type: none"> Megan Gittins Phil Morton
21/04/08	The Mailbox, Birmingham	M11,12&16	<ul style="list-style-type: none"> Graham Beal, Territory Engineer (E&P) Mike Dobb, Assurance Engineer (Contact Systems) 	<ul style="list-style-type: none"> Megan Gittins James Webb

Date	Venue	Audit	For Network Rail (or Other)	For Reporter A
21/04/08	Swindon	M6 Western	<ul style="list-style-type: none"> Peter Muir, Territory Geotechnical Engineer Kevin Laidlaw, Territory Assurance Engineer (Civils) Andrew Holley, Senior Earthworks Management Engineer 	<ul style="list-style-type: none"> Nicola Nortcliffe Mike Adkin
21/04/08	The Mailbox, Birmingham	M9	<ul style="list-style-type: none"> Bernard Weall, FMS Administrator 	<ul style="list-style-type: none"> Megan Gittins Phil Morton
21/04/08	Swindon	M8 Western	<ul style="list-style-type: none"> Michael Smith, Territory Structures Engineer Kevin Laidlaw, Territory Assurance Engineer (Civils) Kevin Giles, Senior Structures Management Engineer Steve Fawcett, Civil Examinations Engineer Barry Noakes, SEC (Amey/ Owen Williams) 	<ul style="list-style-type: none"> Nicola Nortcliffe Mike Adkin
21/04/08	Leeds	M4, Timetabling	<ul style="list-style-type: none"> Chris Myers, Possession Systems Support Specialist Nigel Fisher, Head of Monitoring (ORR) 	<ul style="list-style-type: none"> Nicola Forsdike
22/04/08	George Stevenson House, York	C2	<ul style="list-style-type: none"> Tim Fuller, Acting National Track Geometry & Gauging Engineer 	<ul style="list-style-type: none"> Vidhi Mohan
23/04/08	40 Melton Street	JPIPs, Operational Performance	<ul style="list-style-type: none"> John Thompson, Performance Improvement Manager Nigel Salmon, Senior Performance Analyst 	<ul style="list-style-type: none"> Nicola Forsdike
23/04/08	George Stevenson House, York	M1 & M2 LNE	<ul style="list-style-type: none"> Andrew Beeson, Territory Rail Management Engineer 	<ul style="list-style-type: none"> Nicola Nortcliffe Phil Edwards
23/04/08	George Stevenson House, York	M11,12&16 - LNE	<ul style="list-style-type: none"> Paul Ramsey, Territory E&P engineer Geoff Morris, Territory E&P Engineer (Contact Systems) Tommy Watson, Territory E&P Engineer (Contact Systems Assurance) 	<ul style="list-style-type: none"> Megan Gittins James Webb
24/04/08	Buchanan House, Glasgow	M1 & M2 Scotland	<ul style="list-style-type: none"> Michele Mullen, Territory Assurance Engineer/ Territory Rail Management Engineer Fay Stewart, Area Rail Management Engineer Patrick Honnor, Area Rail Management Engineer 	<ul style="list-style-type: none"> Nicola Nortcliffe Phil Edwards
24/04/08	STPE Design Office, Reading	M24	<ul style="list-style-type: none"> Paul Greensmith, Principal Business Planner Richard McCulloch, Lead Development Mgr, Western & ERTMS Richard Henstock, Signalling Strategy Engineer 	<ul style="list-style-type: none"> Vidhi Mohan Phil Morton
24/04/08	121 House, Swindon	M17	<ul style="list-style-type: none"> Tony Perkins, Territory Project Manager Andy Gerrish, Project Manager (<i>Grontmij</i>) 	<ul style="list-style-type: none"> Megan Gittins Cliff Buckton
28/04/08	40 Melton Street	Renewals Variance	<ul style="list-style-type: none"> Andy Tappern, Financial Controller Renewals 	<ul style="list-style-type: none"> Duncan Mills
28/04/08	40 Melton Street	Renewals Variance	<ul style="list-style-type: none"> Andy Tappern, Financial Controller Renewals 	<ul style="list-style-type: none"> Duncan Mills

Date	Venue	Audit	For Network Rail (or Other)	For Reporter A
28/04/08	Lyndon House, Birmingham	M23 M26 M27 M28 M29	<ul style="list-style-type: none"> Stephen Dent, Commercial Manager – Civils Framework Agreement 	<ul style="list-style-type: none"> Mike Adkin
28/04/08	121 House, Swindon	M10	<ul style="list-style-type: none"> Lyn Townsend, Signals Renewals Assessment Engineer Craig McClintock, Territory Renewals Engineer Brian Hatfield, Network Monitoring Manager (ORR) 	<ul style="list-style-type: none"> Megan Gittins Phil Morton
29/04/08	Manchester – Mouchel Offices	M17	<ul style="list-style-type: none"> Shelley Meireles, Territory Project Manager Richard Connolly, Project Manager (Mouchel) 	<ul style="list-style-type: none"> Megan Gittins Cliff Buckton
01/05/08	Park Junction Interlocking	M10	<ul style="list-style-type: none"> Lyn Townsend, Signals Renewals Assessment Engineer Craig McClintock, Territory Renewals Engineer 	<ul style="list-style-type: none"> Phil Morton
01/05/08	The Mailbox, Birmingham	M1 & M2 LNW	<ul style="list-style-type: none"> Ian Davidson, Territory Welding Engineer/ Acting Territory Rail Management Engineer 	<ul style="list-style-type: none"> Nicola Nortcliffe Phil Edwards
02/05/08	40 Melton Street	M20-M22, M25	<ul style="list-style-type: none"> Steve Roarty, Principal Programme Planner, Track Clare Bingham, Senior Planner, Track 	<ul style="list-style-type: none"> Vidhi Mohan Phil Edwards
02/05/08	London Waterloo	M23 M26 M27 M28 M29	<ul style="list-style-type: none"> Tass Ali, Programme Commercial Manager 	<ul style="list-style-type: none"> Mike Adkin
06/05/08	WSP Office, Buchanan House, London	M17&19	<ul style="list-style-type: none"> Ian McDowell, Technical Director (WSP) Nigel Fisher, Head of Monitoring (ORR) 	<ul style="list-style-type: none"> Megan Gittins Cliff Buckton
08/05/08	George Stevenson House, York	C1 LNE	<ul style="list-style-type: none"> Edward Hart, Positioning & Traffic Analyst 	<ul style="list-style-type: none"> Vidhi Mohan
12/05/08	40 Melton Street	M3&M5	<ul style="list-style-type: none"> Tim Fuller, Acting National Track Geometry & Gauging Engineer John Turner, National Engineering Information Analyst 	<ul style="list-style-type: none"> Nicola Nortcliffe Phil Edwards
13/05/08	1 Eversholt St	M1&M2	<ul style="list-style-type: none"> Brian Witney, National Rail Management Engineer Mary Jordan, National Engineering Reporting Manager 	<ul style="list-style-type: none"> Nicola Nortcliffe Phil Edwards
14/05/08	40 Melton Street	M11-16	<ul style="list-style-type: none"> Nick Snell, Strategy Engineer E&P David McQuillan, Systems Acceptance Engineer (E&P) Glen Wiles, Contact Systems Engineer (E&P) Rachel Evans, Assistant Business Planning Engineer Mark Sturgess, E&P Procedures Engineer (Contact Systems) 	<ul style="list-style-type: none"> Megan Gittins James Webb
15/05/08	40 Melton Street	M17&19	<ul style="list-style-type: none"> Tim Stringer, Asset Performance Engineer – Operational Property 	<ul style="list-style-type: none"> Megan Gittins Cliff Buckton
15/05/08	40 Melton Street	M9	<ul style="list-style-type: none"> Tim Stringer, Asset Performance Engineer – Operational Property 	<ul style="list-style-type: none"> Megan Gittins Phil Morton

Date	Venue	Audit	For Network Rail (or Other)	For Reporter A
16/05/08	Anglia House	M1 & M2 Southern	<ul style="list-style-type: none"> Dave Gilbert, Territory Rail Management Engineer Peter Moore, Territory Rail Management Engineer Geoff Caten, Ultrasonics Manager Sharon Tydeman, Rail Management Technician 	<ul style="list-style-type: none"> Nicola Nortcliffe Phil Edwards
16/05/08	40 Melton Street	M10	<ul style="list-style-type: none"> Paul Mann, Signalling Strategy Engineer Andy Smith, Business Planning Engineer (Signals) 	<ul style="list-style-type: none"> Megan Gittins Phil Morton David Simmons
19/05/08	40 Melton Street	M8	<ul style="list-style-type: none"> Steve Fawcett, Civil Examanations Engineer Andrew Clayton, Principle Civil Engineer (Structures and Buildings) 	<ul style="list-style-type: none"> Nicola Nortcliffe
20/05/08	40 Melton Street	C1, C2, C3, C4	<ul style="list-style-type: none"> Tony Smith, Engineering Reporting Specialist 	<ul style="list-style-type: none"> Vidhi Mohan
20/05/08	Bristol Parkway Depot	M1 & M2 Western	<ul style="list-style-type: none"> Tony Scriven, Territory Rail Management Engineer John James, Territory Rail Management Engineer 	<ul style="list-style-type: none"> Nicola Nortcliffe Phil Edwards
21/05/08	125 House, Swindon	M23, M26-M29	<ul style="list-style-type: none"> Robert Oswald, Programme Efficiency Analyst Ifzal Choudhery, NR 	<ul style="list-style-type: none"> Vidhi Mohan Mike Adkin
23/05/08	40 Melton Street	Mileage -- Passenger	<ul style="list-style-type: none"> Rene Tym, Performance Reporting Analyst 	<ul style="list-style-type: none"> Vidhi Mohan
28/05/08	George Stevenson House, York	M20-M22, M25	<ul style="list-style-type: none"> Ian Fletcher, Financial Analyst 	<ul style="list-style-type: none"> Vidhi Mohan
28/05/08	40 Melton Street	M6	<ul style="list-style-type: none"> Eifion Evans, Civil Engineer (Geotechnics) 	<ul style="list-style-type: none"> Nicola Nortcliffe Mike Adkin
29/05/08	40 Melton Street	Mileage -- Freight	<ul style="list-style-type: none"> Alan Porter, Financial Analyst 	<ul style="list-style-type: none"> Vidhi Mohan
18/06/08	40 Melton Street	CAF	<ul style="list-style-type: none"> Tariq Yasuf, Programme Control Manager 	<ul style="list-style-type: none"> Duncan Mills
18/06/08	40 Melton Street	CAF	<ul style="list-style-type: none"> Tariq Yasuf, Programme Control Manager 	<ul style="list-style-type: none"> Duncan Mills
23/06/08	40 Melton Street	Debt/ RAB Ratio	<ul style="list-style-type: none"> Ian Ramshaw, Group Financial Accountant 	<ul style="list-style-type: none"> Duncan Mills
23/06/08	40 Melton Street	Debt/ RAB Ratio	<ul style="list-style-type: none"> Ian Ramshaw, Group Financial Accountant 	<ul style="list-style-type: none"> Duncan Mills
24/06/08	40 Melton Street	CAF	<ul style="list-style-type: none"> Robin Hamilton, Senior Cost Analyst Kevin Fuller, Senior Cost Analyst 	<ul style="list-style-type: none"> Duncan Mills
24/06/08	40 Melton Street	MUC	<ul style="list-style-type: none"> Mark Inwood, Head of Maintenance Compliance & Assurance Erwin Klumpers, Programme Manager (Change) 	<ul style="list-style-type: none"> Duncan Mills
24/06/08	40 Melton Street	MUC	<ul style="list-style-type: none"> Mark Inwood, Head of Maintenance Compliance & Assurance Erwin Klumpers, Programme Manager (Change) 	<ul style="list-style-type: none"> Duncan Mills

Date	Venue	Audit	For Network Rail (or Other)	For Reporter A
24/06/08	40 Melton Street	M8	<ul style="list-style-type: none"> • Steve Fawcett, Civil Examanations Engineer • Andrew Clayton, Principle Civil Engineer (Structures and Buildings) • Richard Newall, Civil Examinations Engineer, incoming 	<ul style="list-style-type: none"> • Nicola Nortcliffe • Mike Adkin
25/06/08	40 Melton Street	RAB volume incentive	<ul style="list-style-type: none"> • John Kennedy, Regulatory Economist • Ana Chan, Economic Analyst 	<ul style="list-style-type: none"> • Duncan Mills
25/06/08	40 Melton Street	RAB volume incentive	<ul style="list-style-type: none"> • John Kennedy, Regulatory Economist • Ana Chan, Economic Analyst 	<ul style="list-style-type: none"> • Duncan Mills
26/06/08	40 Melton Street	MUC	<ul style="list-style-type: none"> • James McGee, Programme Manager NST Mainteance systems and data • Ash Toma, Asset Data Analyst 	<ul style="list-style-type: none"> • Duncan Mills

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
A	Sound textual records, procedures, investigations or analysis properly documented and recognised as the best method of assessment.
B	As A but with minor shortcomings. Examples include old assessment, some missing documentation, some reliance on unconfirmed reports, some use of extrapolation.
C	Extrapolation from limited sample for which Grade A or B data is available.
D	Unconfirmed verbal reports, cursory inspections or analysis.

Accuracy Band	Accuracy to or within +/-	but outside +/-
1	1%	-
2	5%	1%
3	10%	5%
4	25%	10%
5	50%	25%
6	100%	50%
X	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
1	A1			
2	A2	B2	C2	
3	A3	B3	C3	D3
4	A4	B4	C4	D4
5			C5	D5
6				D6
X	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:

- Red: outside nominal target (target missed);
- Green: inside the nominal target (target achieved).
- Grey: no regulatory target set or target no longer applicable.

Measure	04/05 result	05/06 result	06/07 result	07/08 result
Operational Performance				
Total Network Rail caused delay (million minutes)	11.4	10.5	10.5	9.5
Total delay minutes/100 train kms (franchised passenger operators)	1.96	1.93	1.92	1.74
Number of broken rails (M1)	322	317	192	181
Track geometry (M3)				
35mm Top 50%	66.0	67.9	70.0	73.6
35mm Top 90%	90.9	91.8	92.3	93.8
35mm Top100%	97.7	98.0	98.1	98.6
35mm Alignment 50%	76.9	78.8	79.0	82.1
35mm Alignment 90%	94.1	94.8	95.0	95.8
35mm Alignment 100%	97.0	97.3	97.5	97.9
70mm Top 50%	67.7	70.5	72.2	74.7
70mm Top 90%	93.6	94.3	94.7	95.5
70mm Top 100%	96.2	96.5	96.7	97.3
70mm Alignment 50%	82.8	83.2	82.9	87.9
70mm Alignment 90%	96.9	97.1	97.3	98.1
70mm Alignment 100%	98.0	98.2	98.3	98.7
Track geometry – level 2 exceedences (M5)	0.91	0.82	0.72	0.59
Condition of asset TSRs (M4) (Number & Severity)	942	815	710	628
	4,624	4,285	3246	2,790
Earthworks Failures (M6)	54	41	90	107
Signalling failures (M9)	24,950	23,367	22,704	19,900
Signalling asset condition (M10)	2.5	2.4	2.39	2.38
Traction power incidents causing train delays (M11 & M12)	71	49	69	63
	13	6	11	9
Electrification condition – a.c. traction feeder stations & track sectioning points (M13)	1.87	1.85	1.88	3.53
Electrification condition – d.c. substations (M14)	1.82	1.78	1.64	3.61
Electrification condition – a.c. traction contact systems (M15)	1.7	1.7	1.7	1.7
Electrification condition – d.c. traction contact system (M16)	1.9	1.8	1.9	1.9
Station condition index (M17)	2.23	2.22	2.24	2.71
Light maintenance depot – condition index (M19)	2.63	2.58	2.56	2.49
Network Rail Asset Stewardship Incentive Index (ASII) (Based on End of CP3 Target)	0.90	0.80	0.72	0.63
Renewals Efficiency: Unit Costs	9%	18.1%	23%	18.3%
Renewals Efficiency: Budget Variance				16.3%

Figure 16.1.1 Results by measure (2004/05-2007/08), 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 2007/08. 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	2004/05			2005/06		2006/07		2007/08	
	NR	H	MP	NR	H	NR	H	NR	H
	All Measures	Allocated Measures	Allocated Measures	All Measures	All Measures	All Measures	All Measures	All Measures	All Measures
Operational Performance	NG		NG	NG	B3	NG	B2	NG	A2
Customer & Supplier Satisfaction	NG		NG	NG	A2	NG	A2	NG	A1
Joint Performance Process (JPP)	NG		NG	NG	B3	NG	B2	NG	A1
Route Utilisation Strategies (RUSs)	NG		NG	NG	B1	NG	B2	NG	NG
Linespeed capability (C1)	B2		BX	B2	B2	B2	B2	B2	B2
Gauge capability (C2)	B3		B3	B1	B2	B2	B2	B2	B2
Route availability value (C3)	NG		NG	NG	B2	NG	B2	NG	B2
Electrified track capability (C4)	B2		BX	B2	B3	B2	B2	B2	B2
Mileage				NG	B3	NG	B3	NG	B3
Freight Gross Tonne Miles				NG	B3	NG	B2	NG	B2
Number of broken rails (M1)	A2	A1		A2	A1	A1	A1	A1	A1
Rail defects (M2)	B3	B4		B4	B4	B3	B3	B3	B3
Track geometry (M3 & M5)	A2	A1		A1	A1	A1	A1	A1	A1

Figure 17.1.1 Confidence Grades assigned to Annual Return Measures (2004/05 – 2007/08)

Annual Return Measure	2004/05			2005/06		2006/07		2007/08	
	NR	H	MP	NR	H	NR	H	NR	H
	All Measures	Allocated Measures	Allocated Measures	All Measures	All Measures	All Measures	All Measures	All Measures	All Measures
Condition of asset TSR sites (M4)	B2	B2		B2	B2	B2	B2	B2	B2
Earthworks Failures (M6)	A2		AX	A2	A2	A2	A2	A2	A2
Bridge condition (M8)	B3		B2	B3	B2	B3	B2	B2	C3
Signalling failures (M9)	B2	B3		B2	C4	B2	C4	NG	C4
Signalling asset condition (M10)	B3	B3		B3	B3	B3	B3	B3	B2
Traction power incidents causing train delays (M11)	B2	B2		B2	B3	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	B2	B2	BX	BX
Electrification condition – d.c. substations (M14)	NG	B2		B2	B2	B2	B2	BX	BX
Electrification condition – a.c. contact systems (M15)	B3	B3		B3	C3	B3	C3	B4	B3
Electrification condition – d.c. contact system (M16)	B3	B3		B3	C4	B3	C4	B3	C4
Station condition index (M17)	B2		B3	B2	B3	B2	B3	B2	B3
Station facility score (M18)	B2		B3	B2	B2	B2	B2		
Light maintenance depot – condition index (M19)	B3		BX	B2	B4	B2	B4	B2	B4
Asset Stewardship Incentive Index (ASII)	NG	B2		NG	BX	NG	BX	NG	BX
Track Renewal Volumes (M20, M21, M22, M25)	NG	B2		NG	B2	NG	B2	NG	B2
Signalling Renewed (M24)	B3	B2		NG	C4	NG	D3	NG	C3
Structures Volumes (M23)	NG		NG	NG	B2	NG	A3	NG	C3
Structures Volumes (M26-29)	NG		NG	NG	B2	NG	A1	NG	C3
Renewal Efficiency: Unit Costs	NG		NG	NG	B2	NG	B2	NG	B3
Renewal Efficiency: Budget Variance Analysis	NG		NG	NG	B3	NG	B2	NG	B2

Figure 17.1.1(cont) Confidence Grades assigned to Annual Return Measures (2004/05 – 2007/08)

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 2006/07 and 2007/08 are shown in Figure 17.2.1 with a commentary.

Measure	2006/07	2007/08	Commentary
Bridge condition (M8)	B2	C3	A lack of management effort has resulted in a reduction to the quality and accuracy to this data.
Structures Volumes (M23)	A3	C3	The 2007/08 audits revealed aspects of the dataset which had not come to light in previous year's audits. This warranted further investigation by the auditors, which revealed inaccuracies in the data.
Structures Volumes (M26-29)	A1	C3	The 2007/08 audits revealed aspects of the dataset which had not come to light in previous year's audits. This warranted further investigation by the auditors, which revealed inaccuracies in the data.

Figure 17.2.1 Notable variation for 2006/07-2007/08 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:

- (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.

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:

- (a) Network Rail: Asset Reporting Manual for asset management measures;
- (b) Network Rail: KPI Manual for Network Rail Key Performance Indicators;
- (c) 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	-	-	-	-	
	PR	Nov-00	16/03/01	14/12/01	22/03/04	-	-	-	
Station facility score (M18)	DF	Nov-00	Dec-00	16/03/01	17/02/04	-	-	-	Non-material changes: trend analysis unaffected
	PR	Nov-00	05/01/01	07/02/01	16/03/01	22/03/04	28/02/05	-	
LMD condition index (M19)	DF	Nov-00	16/03/01	17/02/04	-	-	-	-	Non-material changes: trend analysis unaffected
	MN	16/03/01	22/03/04	-	-	-	-	-	
	PR	Nov-00	16/03/01	14/12/01	22/03/04	-	-	-	
Track Renewal Volumes (M20)	DF	Nov-00	16/03/01	14/12/01	12/11/02	17/02/04	-	-	Non-material changes: trend analysis unaffected
	PR	Nov-00	16/03/01	14/12/01	22/03/04	-	-	-	
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

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
2007/08-001	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 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.
2007/08-002	JPP recommendation 1. During the 2007/08 audits we witnessed a strengthened links between the JPIP process and infrastructure maintenance & renewal plans. We recommend that this link continue to be monitored, to ensure the anticipated improvements anticipated during CP4 do in fact materialise.
2007/08-003	C1 recommendation 1. 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.
2007/08-004	C1 recommendation 2. 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. It is recognised however that after the organisational changes that have recently happened in the Engineering Knowledge team, Network Rail intend to set up more uniform systems to report this measure.
2007/08-005	C2 recommendation 1. We recommend that Network Rail undertakes a thorough data cleaning exercise of the Capabilities Database to ensure that it accurately reflects the published gauge capability.
2007/08-006	C4 recommendation 1. 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.
2007/08-007	Mileage recommendation 1. We recommend that Chiltern Railways running on LUL infrastructure is excluded from the figure reported.
2007/08-008	Mileage recommendation 2. We recommend that Network Rail analyses the significant differences between data extracted from BIFS and PPS.
2007/08-009	Freight GTM recommendation 1. We recommend that a formal definition and procedure is documented for this procedure and included in the Asset Reporting Manual.
2007/08-010	Management of Late Disruptive Possessions recommendation 1. The measure is this year very much “work in progress”. For next year we will expect to see the level of reliability in the measure much improved. In particular, we will expect to see a) evidence of a clearly documented procedure in place with regard both to source data collection and the undertaking of data analysis/reporting to report on the measure and b) a clear and comprehensive data trail.
2007/08-011	Management of Late Disruptive Possessions recommendation 2. For this year, the measure is a simple numeric one – as such, it has some usefulness in determining Network Rail's measurement of its asset base. However, we recommend that for the future that Network Rail consider increasing the sophistication of this measure, for example, by considering the impact of possessions, factoring in such issues as the length of the notice period and the number of trains plans amended.

Reference code	Recommendation
2007/08-012	M2 recommendation 1. For the fourth year in succession we still 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).
2007/08-013	M2 recommendation 2. 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 & Severe category is reported separately in order to make visible the removal of Heavy & Severe RCF defects. This would enable the benefit of the rail grinding and re-railing work to be assessed.
2007/08-014	M4 recommendation 1. As noted in our Audit Report we have doubts as to the usefulness of this measure. Moreover, data reporting against it is carried out by Network Rail purely for the Annual Return, suggesting it is not a measure they themselves find useful in monitoring the condition of their asset base. We recommend that Network Rail and ORR work 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.
2007/08-015	M6 recommendation 1. 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.
2007/08-016	M6 recommendation 2. We recommend that the asset condition information being collected should be used to form the basis for a new measure for earthworks asset condition.
2007/08-017	M8 recommendation 1. We recommend that the CARRs database be developed to include SCMI data.
2007/08-018	M8 recommendation 2. 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.
2007/08-019	M8 recommendation 3. We recommend that Network Rail commission research into the SCMI second cycle process and that clear instructions are issued to the SEC's.
2007/08-020	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.
2007/08-021	M8 recommendation 5. We recommend that competency standards are re-introduced to Network Rail company standards.
2007/08-022	M8 recommendation 6. We recommend that the SCMI user group is resurrected and given the support it requires to enable it to function.
2007/08-023	M10 recommendation 1. 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.
2007/08-024	M17 recommendation 1. We recommend that a comparative measure to the previous SCI be calculated for the remainder of CP3.
2007/08-025	M17 recommendation 2. 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.

Reference code	Recommendation
2007/08-026	M17 recommendation 3. 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.
2007/08-027	M20-M22, M25 Recommendation 1. We recommend that Network Rail investigates why the volume data extracted from the P3e database differs from that reported in the MBR packs.
2007/08-028	M20-M22, M25 Recommendation 2. We recommend that Network Rail ensures that the practice of reporting ramping in and out of reballasting volume needs to consistently applied and only taken as credit if it is a full reballasting to formation level.
2007/08-029	M23&M26-M29 recommendation 1. Network Rail should review the process by which CAFs form are completed at a Territory level. We recommend that framework contractors be instructed to prepare the CAF form as part of their duties and that this forms part of their Key Performance Indicators.
2007/08-030	Safety recommendation 1. We have some minor concerns in relation to the data accuracy of these KPIs (for example, the hours worked figure used in RIDDOR). We recommend that Network Rail give due attention to continuing to support its Safety Team in improving data accuracy.
2007/08-031	Safety recommendation 2. We have some concerns over the consistency of the definitions and results (for example, the level crossing misuse) and the communications of changing definitions of KPIs. We recommend that these are corrected and the correct processes are established to ensure that future changes in definitions are correctly communication through Network Rail.
2007/08-032	Environment recommendation 1. New KPIs are being developed for 2008/09 which will include the 17 key suppliers in Network Rail's supply chain. KPIs will cover for example, how much fuel is used in delivering supplies/services to Network Rail. Performance KPIs will be reported to the Network Rail Board through an environmental index. Given the developing awareness and sophistication of the management of environmental measures within Network Rail, it may be appropriate to give thought to defining appropriate KPIs for future Annual Returns. These should be based on factors already measured by Network Rail.
2007/08-033	MUC recommendation 1. We recommend that responsibilities and accountabilities for the quality of data in Ellipse is reviewed, allocated and documented. This review should include <i>inter alia</i> 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.
2007/08-034	MUC recommendation 2. 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.
2007/08-035	MUC recommendation 3. 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.
2007/08-036	Track unit costs recommendation 1. 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.

Reference code	Recommendation
2007/08-037	Structures, Signalling & Telecoms Renewals unit costs recommendation 1. We recommend that Network Rail assesses the extent of any possible geographical skew for each Repeatable Work Item (RWI) and, if necessary, undertakes steps to mitigate this skew, such as monitoring the extent of geographical skew for CAF reports that are entered into the CAF database (RIB) or normalising the dataset where necessary.
2007/08-038	Renewal unit costs recommendation 1. We recommend that Network Rail use consistent RPI rates for rebasing prices or reference the appropriate inflation indices in the Annual Return and/or calculation spreadsheets if other indices are used.
2007/08-039	RAB Volume Incentives recommendation 1. 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.

21 Appendix J: Observations

<p>JPP observation 1. The success of Network Rail in delivering the JPP relies not just on its own efforts but also the willingness of Train Operating Companies to participate constructively in the process. This is particularly difficult where the objectives of companies are misaligned. This can happen where for example the performance targets of a particular franchise agreed between a TOC and the DfT are not in line with Network Rail's own Route targets as outlined in its business plan, or where Network Rail is attempting to juggle the aspirations of a number of different operators with different service characteristics and different performance targets. The delivery of improvements has to be a joint process, with all parties equally committed to a common goal. Without stakeholder support in this, it can be difficult for Network Rail to deliver the outcomes that others desire.</p>
<p>M2 observation 1. We recognise the progress being made on the initiative to apply the Ultrasonic Test Unit (UTU) testing to lines which are Track Category 1A, 1, 2 and 3 and the aim to comply with the mandatory testing requirements using the UTU instead of pedestrian ultrasonic testing, where practicable. As part of this process Network Rail have a wish to separate suspect defects from actionable defects in order to manage the data. We recognise that the testing process, as it improves, will most likely increase the overall volume of defects found, particularly if more defects are being discovered which were previously not picked up. Therefore we support and endorse the initiative to separate suspect defects from actionable defects so that in the future, trend analysis will be more reliable.</p>
<p>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 will enable visibility of trends in the severity of failures, and the risk they pose to the railway.</p>
<p>M8 observation 1. We note Network Rail's statement that it intends to move to a risk based approach and that the interval frequency for SCMI examinations is likely to vary for specific structure types. The effects on future SCMI analysis need to be considered as part of this process. The alteration of the exam frequency for all structures in Scotland from 6 to 8 years is inconsistent with this statement.</p>
<p>M8 observation 2. We note that Network Rail are commencing analysis of the SCMI data for metal bridges with second cycle examinations. We would suggest that such data should be treated with caution given the small sample, uncertainty of the pre 2003/4 data collection and the absence of linkages between any interventions.</p>
<p>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.</p>
<p>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.</p>
<p>Safety observation 1. In auditing this measure the contrast between Safety and Performance reporting has been marked. It is evident that the Performance Reporting and Improvement system has benefited immensely from the high focus of attention within the industry as a whole on train service performance. Whilst already competent, there may be benefits from taking some of the best practice that has been learned in the area of Performance Reporting and extending this into SMIS. This could, for example, include a greater focus on data quality, consistency of reporting, exchange of best practice and so on.</p>
<p>Safety observation 2. We note that the Safety Team is working to refine the targets for their Safety KPIs. for example, the development of a risk ranking tool to understand better the potential impact of operating irregularities. We support Network Rail in this.</p>
<p>Environment observation 1. We were particularly interested to note during audit that a conscious effort had been taken by one manager to use processes already familiar to front-line managers and staff from safety management practices to raise the profile and improve the management of environmental issues. This using of a tried and tested approach for a new application seems to be delivering significant benefits in terms of local understanding and ownership. In this case it has come about because the responsible manager had experience in both safety and environment processes. However, there may be benefits to be gained elsewhere in Network Rail from sharing best practice of this kind cross discipline.</p>

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.

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).